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College of Engineering

Graduate Catalog 2026-2027

Welcome to the UToledo College of Engineering. The College of Engineering offers graduate education at the doctoral, masters, and certificate levels. At the doctoral level, the College offers a PhD in Biomedical Engineering and a PhD in Engineering with concentrations in seven (7) areas: bioengineering, chemical, civil, electrical, industrial, and mechanical engineering, and computer science and engineering. The College offers ten (10) Master of Science degrees, including two programs - general engineering and energy engineering - that are offered 100% online. For those interested in other continuing education options, specialized graduate certificates in aerospace engineering, cyber security, manufacturing, materials science and engineering, and mechatronics are also available.

Our traditional on-campus graduate programs prepare engineers for research and advanced engineering careers. Our online-programs for working professionals provide a blend of engineering and business courses to help advance your career.

COLLEGE ADMINISTRATION

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College Policies (Graduate Handbook)

The College of Engineering offers graduate programs in bioengineering, cyber security, chemical, civil and environmental, computer science and engineering, electrical, energy, general, industrial, and mechanical engineering. In addition, the College of Engineering and the College of Medicine and Life Sciences jointly offer a doctoral program in biomedical engineering. General requirements for the engineering graduate programs are identified below. Interested students should also consult program-specific and College of Graduate Studies admission requirements provided in the catalog.

Entrance Requirements

The graduate programs are open to all qualified individuals with a bachelor of science (B.S.)/master of science (M.S.) in engineering. Applicants should have a grade point average (GPA) of at least 3.0/4.0 in previous undergraduate course work and at least 3.3/4.0 in previous

graduate work. Students with a degree in a related field may be eligible for admission provided they meet the minimum background requirement that includes two years of calculus through differential equations and one year of engineering physics. In some cases, other prerequisite courses may be required. Course credits for meeting undergraduate prerequisites are not applied toward the graduate degree. Check individual programs for specific admissions requirements.

Application requirements vary by program and can be found under the program's admission tab in the catalog. Generally, a complete application for admission includes the following items:

- Application for admission (https://www.utoledo.edu/graduate/apply/) to the College of Graduate Studies
- Statement of purpose in the application that indicates the areas of engineering in which the applicant is interested
- Two or three letters of recommendation, depending on program
- Official transcripts of all previous college-level work. A foreign credential evaluation (https://www.utoledo.edu/graduate/admission/foreign-credentialing/) is required for all applicants who have completed coursework or degrees at non-US institutions.
- Scores of the Graduate Record Exam (GRE), if required by program
- English language proficiency scores for students from non-English speaking countries. UToledo accepts scores from the TOEFL IBT (80 or above); TOEFL PBT (550 or above); IELTS (6.5 or above); PTE (58 or above); and Duolingo (105 or above). Refer to College of Graduate Studies graduate admissions for testing exceptions.
- Professional resume (online programs)
- Payment of the application fee

All application materials should be submitted to the College of Graduate Studies. Admission of qualified applicants to any graduate program is contingent on availability of openings for incoming students. To receive full consideration for financial support, the application should be received in advance of department deadlines listed on the program's admission tab in the catalog. Most full-time students are admitted for the fall semester of the academic year due to the sequential nature of courses. Applications are considered as they are received; please be advised that only complete application files will be reviewed for admissions.

International students admitted to a graduate program must request an I-20 and may be required to provide documentation of financial responsibility.

COLLEGE OF GRADUATE STUDIES

- College of Graduate Studies Policies and Procedures (p. 407)
- Academic Regulations (p. 412)

Admission

Applications for admission (https://www.utoledo.edu/graduate/apply/) and all supporting materials should be submitted directly to the College of Graduate Studies. Applications to the doctoral programs in biomedical engineering and mechanical engineering should be to these specific programs. All other doctoral applications should select the Ph.D. in Engineering with a program-specific concentration. Students applying to the M.S. in computer science and engineering and the two online M.S. programs should select the M.S. in Engineering and the program-specific concentration.

To be admitted to a graduate program in the College of Engineering, the applicant must have a bachelor's degree in engineering or a closely related field. Admission is made on an individual basis, taking into account the applicant's previous academic record, the intended area of study and professional experience. Individual departments may have additional requirements. Generally, a GPA of at least 3.0 is required for admission. Applicants having a GPA of less than 3.0 who demonstrate potential for graduate study may be admitted to the master's program on a provisional or other basis at the discretion of the department. All students from non-English speaking countries must provide documentation of English language proficiency; most programs require completion of the GRE. Specific admission requirements are described under the degree program's admissions tab in this catalog or on the College of Graduate Studies Admission Requirements (https://www.utoledo.edu/graduate/admission/requirements/) webpage.

The program admissions committee will make the admission decision subject to department and college policies and review by the College of Graduate Studies. The applicant should clearly indicate an area of intended concentration and/or the department and program of intended study. The criteria for admission include the baccalaureate and previous graduate record (grades, curricular content, and diplomas); the student's potential for success as indicated by professional references and relevant post-baccalaureate experience; the scores on required standardized tests; and the availability of openings within a program or research laboratory.

Most successful applicants for a doctoral program will have completed a master's degree in the intended area of study or a closely related field. For an applicant who has an outstanding undergraduate record and no master's degree, direct admission to the doctoral program is available. Students without a prior M.S. degree may elect to apply for a master's along the way to the doctoral degree. Applicants seeking direct admission must satisfy all prerequisites for graduate study in the intended field of study and must have achieved an undergraduate GPA of at least 3.0.

Combined Bachelor's to Master's Program

The College of Engineering encourages current UToledo students who wish to continue their education and earn graduate degrees in engineering to apply for early admission to one of the College of Engineering's M.S. programs. By entering the M.S. program prior to completing the B.S. degree requirements, talented students may begin working on their graduate coursework and research while completing B.S. degree requirements. Students may apply up to 9 cr hr of graduate coursework toward both B.S. and M.S. coursework requirements, subject to program approvals.

The B.S to M.S program is open to all students in the College of Engineering that have completed at least 2 of the 3 mandatory co-op rotations (engineering science programs only) and have a higher education GPA of 3.3 or higher. Applicants should refer to program application deadlines, and should apply for M.S. admission for the term they plan to register for their first graduate level course. Students are expected to consult with the B.S. and M.S. program directors prior to applying.

Programs that require the GRE exam may review application materials and make early admission decisions in advance of receiving the test score.

Students accepted into the combined B.S. to M.S. program will be granted admission to enroll in graduate level courses. A student must file an M.S. plan of study immediately after being granted early admission to the M.S. program. The plan must specify up to 9 cr hr of graduate course work that will be applied toward specific B.S. degree requirements. The student must meet all the requirements of the M.S. program as specified by the College of Graduate Studies, the College of Engineering, and the degree program.

Master of Science Programs

The master's degree programs are intended to provide advanced study in an area of engineering. The programs provide sufficient flexibility to allow students to develop an area of specialization, broaden their educational experience into additional areas of engineering, or synthesize an integrated program of interdisciplinary studies through a thesis or project.

Plan of Study

Master's degrees in the College of Engineering are offered with thesis and non-thesis options, depending on the degree program. Consult graduate program requirements to determine program completion options. Each option is described in more detail below.

1. **Thesis option:** A minimum of 30 credit hours of approved graduate study, including nine credit hours (9 cr hr) of thesis research under the supervision of a faculty member, is required. Students are required to submit a written thesis and successfully complete the oral defense of the thesis work. The thesis committee must have a minimum of three committee members. All M.S. theses are uploaded to OhioLink for electronic access and archival purposes. Additional guidelines and requirements may exist for individual programs. Students with assistantship funding are expected to complete the M.S. thesis.
2. **Non-thesis option:** The master of science with non-thesis option is available with the approval of the department chair or the department graduate program director and/or faculty advisor.
    a. **Master of science degree with project option:** Students are required to complete a minimum of 30 credit hours of approved graduate study, including six credit hours (6 cr hr) of master of science project under the supervision of a faculty advisor as specified by individual department guidelines and requirements. Students are required to submit a written project report to the department for approval and archiving. The project committee must have a minimum of two committee members.
    b. **Master of science degree with course work-only option:** Students are required to complete a minimum of 30 credit hours of approved graduate-level course work. Additional hours of course work to replace thesis or project are selected from departmental electives approved by the department chair or the graduate program director.

A plan of study that specifies registration terms and credit hours for all program requirements (thesis or project requirements and graduate course work), as well as any specified preparatory undergraduate course work, is to be developed by the student working with his/her advisor. The plan of study should be submitted for review and approved by the department before 12 credit hours of graduate course work are completed in the program of study. Students are responsible for verifying that planned courses meet the program requirements and tracking their progress toward degree using the University Degree Audit system. Graduate course work may be selected from engineering, math, science, business and related fields, subject to course category restrictions specified by the individual programs. Students should consult the program catalog requirements, degree audit, and department handbook for additional requirements. University-level guidelines and policies that are applicable to all students pursuing a master's degree are provided under The College of Graduate Studies section of the graduate catalog.

To be awarded the Master of Science degree, a student must have at least a B average (minimum GPA of 3.0/4.0) for all graduate course credits in the program as well as for the entire graduate transcript. Only credit hours obtained with a letter grade of "C" or higher, or an "S" grade for the limited number of classes offered on a satisfactory or unsatisfactory basis, will fulfill degree requirements.

Doctoral Degree Programs

The Doctor of Philosophy programs in the College of Engineering are intended for academically outstanding students with appropriate bachelor's degrees. The programs require the completion and defense of a significant, original research dissertation. Potential fields of study include biomedical engineering, chemical engineering, civil and environmental engineering, computer science and engineering, electrical engineering, industrial engineering, and mechanical engineering.

Advisory Committee

Doctoral students, in consultation with the graduate program director and departmental chair, should select an advisor during their first term of study. Since the advisor is expected to become the student's dissertation supervisor, selection should be based on mutual agreement and common interests with the expectation that the student and advisor can work effectively together. Notification of the advisor's appointment should be forwarded to the department's graduate program director, the college's associate dean of graduate studies, and the College of Graduate Studies.

The student and advisor should agree on a general area for the dissertation within the first year of study, and an advisory committee should be appointed subject to the approval of the graduate program director and departmental chair. This committee, in general, is composed of a minimum of five graduate faculty members, with at least one from outside the focus area and one from outside the department of the advisor. The duties of the advisory committee include developing a plan of study that will prepare the student in the chosen field and facilitate successful completion of the dissertation; reviewing and approving the dissertation proposal; advising and assisting in the completion of the dissertation research and preparation of the dissertation document; and conducting the dissertation defense. Students are referred to additional details and requirements provided in the graduate student handbook of individual departments.

Plan of Study

The advisory committee's first responsibility is to work with the student to develop and submit for approval a doctoral program plan of study (POS) that meets all university, college, and department requirements. The POS must be reviewed, approved, and submitted to the College of Graduate Studies prior to completion of 12 credit hours in the program of study. The plan of study specifies the course work and other requirements for the Ph.D., including qualifying examinations or publications. Students are responsible for verifying that planned courses meet the program requirements and tracking their progress toward degree using the University Degree Audit system.

The plan of study requires a minimum of 45 credit hours each of dissertation research and course work. Students admitted to the Ph.D. program with a prior M.S. degree may be granted credit for up to 30 credit hours of course work from their M.S. degree. Course work must satisfy core course and other requirements specified for the student's focus area by the department. Graduate course work may be selected from engineering, math, science, business and related fields, subject to course category restrictions specified by the individual programs. Students should consult the program catalog requirements, degree audit, and department handbook for additional requirements. University-level guidelines and policies that are applicable to all students pursuing a doctoral degree are provided under The College of Graduate Studies section of the graduate catalog.

In order to be awarded the Ph.D. degree, a student must have at least a B average (minimum GPA of 3.0/4.0) for all graduate course work satisfying the degree program as well as for the entire graduate transcript. Only credit hours obtained with a letter grade of "C" or higher, or an "S" grade for the limited number of classes offered on a satisfactory or unsatisfactory basis, will fulfill degree requirements.

Residency Requirement

The College of Graduate Studies has established an academic residency requirement in order to provide doctoral students with the opportunity to engage in intensive, concentrated study over an extended period of time in association with faculty members and other students in an atmosphere conducive to a high level of intellectual and scholarly activity.

More information can be found under the College of Graduate Studies academic regulations section of the catalog.

Examinations

Doctoral students must complete a qualifying examination, a comprehensive examination, or both to continue in the program of study. Please refer to departmental handbooks for details on the qualifying or comprehensive examination timing, process, and procedures.

Admission to Candidacy

Students typically apply for admission to candidacy following the completion of coursework requirements and completion of any required qualifying examinations. At the time a student applies for admission to candidacy, the student must have a minimum 3.0/4.0 cumulative GPA and have satisfactorily completed the department examination requirements.

Dissertation Proposal

The student, working with the advisor, should develop a detailed written dissertation proposal for presentation to the advisory committee. The proposal should state the objectives, provide appropriate background, and describe the general approach to accomplish the research clearly and completely. Specific procedures and details for the timing, preparation, distribution and defense of this proposal are noted in departmental requirements. An approved copy of the accepted proposal, signed by each member of the advisory committee, will be kept in the student's file.

Dissertation Defense

After the advisor and committee have approved the dissertation proposal, the student should carry out the dissertation plan. When the advisor and student believe the work is complete and ready for defense, a dissertation document should be prepared with the advisor providing suggestions for improvement until both the advisor and the student believe the document is ready for publication. The advisor-approved dissertation document should be distributed to the committee in advance of the public dissertation defense.

Notice of the scheduled dissertation defense exam should be sent to the department graduate director, associate dean of graduate studies of the College of Engineering, and the College of Graduate Studies, and should be posted on College of Engineering notification sites. Dissertation defenses are open to the public; however, if intellectual property disclosure would be jeopardized by public disclosure, a closed defense can be requested.

Following the oral examination, the advisory committee will vote on whether to approve the dissertation and its defense. The committee will advise the student on what additions or corrections are necessary for the written dissertation document to be considered approved. When all corrections have been approved by the advisor and/or committee, the dissertation is uploaded to OhioLINK for electronic access and archiving. If additional time is needed for completion of patent applications and publications after the dissertation is uploaded, the student must submit an OhioLink publication delay request to the College of Graduate Studies.

Departments

- Department of Bioengineering (p. 16)
- Department of Chemical Engineering (p. 22)
- Department of Civil and Environmental Engineering (p. 28)
- Department of Electrical Engineering and Computer Science (p. 33)
- Department of Mechanical, Industrial, and Manufacturing Engineering (p. 50)

J.D./M.S. Dual Degree Program

Overview

The J.D./M.S. dual degree program offers a student who has been admitted to The University of Toledo College of Law and one of The University of Toledo College of Engineering master of science programs the opportunity to complete requirements for both the J.D. and the M.S.

degrees in an accelerated period of study. The program is designed for full-time students who have an undergraduate degree in engineering or its equivalent. Students with a non-engineering undergraduate degree will be required to complete all prerequisite courses required by the College of Engineering, depending on the nature of the undergraduate degree.

Advising

The College of Law and the College of Engineering will advise regarding that school's curriculum, requirements and guidelines. Within the College of Engineering, advising is handled within the individual department of enrollment and coordinated through the associate dean of academic affairs.

Awarding of Degrees and Credit

A student enrolled in the dual degree program will not receive either the J.D. or M.S. degree until all the work required for both degrees has been completed. A student who withdraws from the dual degree program and remains in either the College of Law or College of Engineering shall receive only as much credit for work in the other college as the dean may authorize under the rules of that college.

No credit for work in the other college shall be awarded unless the student achieves an acceptable grade in the college offering the course. In addition, degrees must be awarded within time limits established by the College of Graduate Studies, the College of Law and the College of Engineering.

ADMISSION REquirements

Students should apply for the dual degree program using both the College of Law standard application form and the College of Graduate Studies application form. A joint admissions committee consisting of admission committee members from both colleges will review those College of Law applications that request dual admission. Although admission to both colleges is required before the student can begin the joint degree program, a student can begin a program in one college and later add the dual-degree program. In this case, courses completed prior to admission to the dual-degree program will be evaluated for program credit according to College of Graduate Studies transfer credit guidelines.

Application and admission requirements for engineering M.S. programs are listed under each program's admission tab in the catalog.

PROGRAM REQUIREMENTS

The integrated program and curriculum lead to the awarding of two degrees. The Juris doctor degree will be awarded by The University of Toledo College of Law, and the Master of Science degree will be awarded by The University of Toledo College of Engineering.

Master of Science in Engineering Degree: To fulfill requirements for the M.S. degree, 30 credit hours at graduate level are required. Students in the joint program may apply up to 12 credit hours of non-first year course work at the College of Law toward meeting the M.S. degree requirements. The College of Law course work eligible for credit toward the M.S. degree will be determined in consultation with the associate dean of graduate studies in the College of Engineering. With the M.S. thesis/project option, students must complete at least 18 credit hours at the graduate level from the College of Engineering, including nine hours of M.S. thesis or six hours of M.S. project. With the M.S. course work-only option, students must complete at least 18 credit hours at the graduate level from the College of Engineering.

Juris Doctor Degree: The College of Law requires the successful completion of 89 credit hours. The dual degree program would permit up to 12 credit hours of core courses done in the College of Engineering to be applied toward the satisfaction of the 89-hour requirement. Engineering course work credited toward the J.D. degree will be determined in consultation with the associate dean for academic affairs in the College of Law.

M.S. in Engineering (General Engineering-online)

OVERVIEW

Dr. Patricia Relue, program director

The College of Engineering at the University of Toledo offers a Master of Science degree in Engineering with a concentration in General Engineering that can be completed part-time, online. This engineering master's degree program is intended for students who are full-time employees seeking a master's degree to facilitate career advancement or achievement of personal educational goals. It is designed for current and future managers and engineers. This cross-disciplinary program combines a study in business management and engineering and presents an alternative to a traditional business management or technical Master of Science degree. To accommodate students who are full-time employees, course work for this degree program may be taken completely online via distance learning.

ADMISSION REQUIREMENTS

To be admitted to the Master of Science in Engineering program with a concentration in General Engineering, applicants must have a bachelor's degree in engineering, engineering technology or a closely related field (e.g., one of the mathematical, physical or biological sciences). Applicants must be employed in an engineering-related industry. Admissions are made on an individual basis and consider the applicant's previous academic record, the intended area of study, and the needs and capacity of the College of Engineering.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 2.7/4.0 grade point average from previous undergraduate coursework
- **Application:** UToledo application required
- **GRE:** Required for applicants with a GPA below 2.7
- **Transcripts:** Required

- **Statement of Purpose:** Required
- **Letters of Recommendation:** 3
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.
- **Resume:** Required

Application priority deadlines for admissions decisions:

- **Fall:** No deadline
- **Spring:** No deadline
- **Summer:** No deadline

Applicants should have a minimum grade point average (GPA) of 2.7 in previous undergraduate work from appropriately accredited academic institutions or from an academic institution with high academic standards considered appropriate and acceptable by the College of Engineering and the College of Graduate Studies. Applicants having a GPA less than 2.7 who demonstrate potential for graduate study may be admitted to the master's program on a provisional basis at the discretion of the college. Students with an undergraduate GPA below 2.7 must submit results of the GRE exam. Information on testing is available on the GRE Web site: http://www.gre.org.

Students who graduated with a bachelor's degree from The University of Toledo do not need to submit official transcripts. Students who did not graduate from The University of Toledo need to contact the office of the registrar at their undergraduate institution to arrange for transmission of the undergraduate transcripts.

Students entering the program without a B.S. in engineering will be required to have at least:

- calculus, through ordinary differential equations (2 semesters);
- physics (2 semesters);
- chemistry and/or engineering materials (1 semester);
- and any three out of the following six: statics, dynamics, electronics, electric circuits, fluid mechanics and thermodynamics.

Students lacking one or more of the above courses must take the necessary courses before entering the program. Contact the program director to determine appropriate courses to meet program prerequisites.

Students can apply for non-degree student status and take up to 9 credit hours of graduate-level coursework that may be applied toward their graduate degree program. Students with non-degree status in good academic standing can be admitted to the program as regular graduate students at a later date.

For additional information regarding this program, please consult the College of Engineering's website at https://www.utoledo.edu/engineering/graduate-studies/ptmse-general.html or contact the program director.

DEGREE REQUIREMENTS

The Part-Time Master of Science in Engineering with a concentration in General Engineering program requires 30 credit hours of graduate level course work. The project option requires the completion of a minimum of 24 credit hours of approved graduate course work and 6 credit hours of a work-related project. Specific curriculum requirements are provided below.

Code	Title	Hours
Engineering Core Courses: Minimum of 2 courses		**6**
GNEN 5500	Applications of Engineering Analysis	3
GNEN 5700	Applied Probability and Statistics	3
GNEN 6700	Management of Projects and Technological Innovation	3
Business Core Courses: Minimum of 1 course		**3**
ACCT 5000	Financial And Managerial Accounting	3
ACCT 5100	Data Analytics in Accounting	3
BLAW 6100	Business, Government And Society	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6400	Results-Based Management	3
BUAD 6600	Supply Chain Management	3
BUAD 6800	Information Technology And E-Business	3
EFSB 6590	New Venture Creation	3
FINA 5310	Managerial Finance and Economics (FINA 5310 replaced FINA 5210)	3
Engineering Electives: Minimum of 4 courses		**12**
CIVE 5690	Sustainability Engineering	3
EECS 5240	Power Systems Operation	3
EECS 5260	Control Systems Design	3
EECS 5460	Power Systems Management	3
EECS 5480	Power Electronics 1	3
GNEN 6200	Environmental Efficiency for Buildings	3
MIME 5080	Operations Research I	3
MIME 5410	Alternative Energy	3
MIME 5820	Sustainability Analysis and Design	3
MIME 5830	Additive Manufacturing	3
Project or Coursework option		**9**
Work-Related Project Option:		
GNEN 6920	Special Projects in Engineering	6
Any additional course from categories above		3
Coursework option		
Any additional 3 courses from categories above		9

- The engineering core courses establish a common foundation in engineering mathematics and project management. The engineering core courses are designed to update computer analysis skills, provide a background in applied statistics and to furnish tools for the management of projects and technological innovation.
- The business core courses cover a broad range of topics that are important for engineers that are taking on responsibilities outside of a traditional engineering technical track. The business core is intended to provide engineers, scientists and technologists with

financial and managerial skills that can help the engineer succeed in today's marketplace.

- The engineering elective courses support a technical focus area. In addition to those listed in the table above, any graduate level course in bioengineering, chemical engineering, civil and environmental engineering, electrical engineering and computer science, general engineering, or mechanical, industrial and manufacturing engineering departments can be selected as an elective.

All students must complete 21 cr hr based on the engineering core, business core, and engineering electives as described above. Students completing a course work only degree will take an additional 9 cr hr of courses from the three categories.

Students electing the project option will take one additional course and will complete 6 cr hr of a work-related project (GNEN 6920). The topic and other specifics of the project require prior approval of the program director and should include approval and cooperation of the employer. The project may be completed over one or more semesters. Students may complete their course requirements in four semesters by taking the recommended two courses (6 cr hr) per semester.

For transfer credit, students should refer to the general policies of the College of Graduate Studies. No more than 9 cr hr toward the Master of Science in engineering may be earned at another university with a grade of B or better, and in no case may the project be satisfied by work already completed at another institution or on the job.

In order to be awarded the Master of Science in Engineering degree, the student must have at least a B average (minimum GPA of 3.0/4.0) for all graduate course credits in the program as well as for the entire graduate transcript. Only credit hours obtained with a letter grade of "C" or higher, or an "S" grade for the limited number of classes offered on a satisfactory or unsatisfactory basis, will fulfill degree requirements.

Course work only degree option:

First Year		
First Term		**Hours**
GNEN 5500	Applications of Engineering Analysis	3
GNEN 6700	Management of Projects and Technological Innovation	3
	Hours	**6**
Second Term		
GNEN 5700	Applied Probability and Statistics	3
GNEN 6200	Environmental Efficiency for Buildings	3
	Hours	**6**
Third Term		
ACCT 5000	Financial And Managerial Accounting	3
MIME 5080	Operations Research I	3
	Hours	**6**
Second Year		
First Term		
MIME 5460	MATLAB and C/C++ for Engineers	3
FINA 5310	Managerial Finance and Economics	3
	Hours	**6**
Second Term		
GNEN 6980	Special Topics in Engineering	3
MIME 5820	Sustainability Analysis and Design	3
	Hours	**6**
	Total Hours	**30**

Project-based degree option:

First Year		
First Term		**Hours**
GNEN 5500	Applications of Engineering Analysis	3
GNEN 6700	Management of Projects and Technological Innovation	3
	Hours	**6**
Second Term		
GNEN 5700	Applied Probability and Statistics	3
MIME 5460	MATLAB and C/C++ for Engineers	3
	Hours	**6**
Third Term		
ACCT 5000	Financial And Managerial Accounting	3
MIME 5080	Operations Research I	3
	Hours	**6**
Second Year		
First Term		
GNEN 6920	Special Projects in Engineering	3
FINA 5310	Managerial Finance and Economics	3
	Hours	**6**
Second Term		
MIME 5820	Sustainability Analysis and Design	3
GNEN 6920	Special Projects in Engineering	3
	Hours	**6**
	Total Hours	**30**

- PLO 1. Students will obtain proficiency in solving complex engineering problems by applying advanced principles of engineering, science, and mathematics.
- PLO 2. Students will obtain proficiency in applying engineering design, operations management, and business knowledge, to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- PLO 3. Students will be able to recognize ethical and professional responsibilities in engineering situations and to make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- PLO 4. Students will obtain proficiency in analyzing and interpreting data and using engineering judgment to draw conclusions.

- PLO 5. Students will be able to acquire and apply new knowledge as needed using appropriate learning strategies, and engaging in lifelong learning.
- PLO 6. Students will able to acquire key management skills including creating a collaborative and inclusive environment, establishing goals, planning tasks, and meeting objectives.

M.S. in Engineering (Energy Engineering - online)

OVERVIEW

Dr. Patricia Relue, program director

The College of Engineering at the University of Toledo offers a Master of Science degree in Engineering with a concentration in Energy Engineering that can be completed part-time, online. The energy field, subject to ever-increasing challenges, is vital to all aspects of society and necessary for assuring a sustainable quality of life across the globe. Graduates of the University of Toledo's Master of Science in Engineering with a Concentration in Energy Engineering degree develop expertise in many complementary areas, such as public policy, energy management, energy economics and finance, and energy consulting. This highly customizable program is not just for engineering graduates with technical portfolios. With flexibility and options for coursework in law, business and finance, the concentration in energy engineering is ideal for professionals at companies that generate and distribute energy, as well as anyone seeking to manage energy portfolios in a variety of businesses and industries. To accommodate working professionals, course work for this degree program may be taken completely online via distance learning.

ADMISSIONS REQUIREMENTS

To be admitted to the Master of Science in Engineering with a concentration in Energy Engineering program, applicants must have a bachelor's degree in engineering, engineering technology or in a closely related field (e.g., one of the mathematical, physical or biological sciences). Admissions are made on an individual basis and consider the applicant's previous academic record, the intended area of study, and the capacity of the College of Engineering.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 2.7/4.0 grade point average from previous undergraduate coursework
- **Application:** UToledo application required
- **GRE:** Required for applicants with a GPA below 2.7
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 3
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.
- **Resume:** Required

Application priority deadlines for admissions decisions:

- **Fall:** No deadline
- **Spring:** No deadline
- **Summer:** No deadline

Applicants should have a minimum grade point average (GPA) of 2.7 in previous undergraduate work from appropriately accredited academic institutions or from an academic institution with high academic standards considered appropriate and acceptable by the College of Engineering and the College of Graduate Studies. Applicants having a GPA less than 2.7 who otherwise demonstrate potential for graduate study may be admitted to the master's program on a provisional basis at the discretion of the College. Students with an undergraduate GPA below 2.7 must provide GRE scores. Information on the GRE is available on the GRE Web site: http://www.gre.org.

Students who graduated with a bachelor's degree from the University of Toledo do not need to submit an official transcript. Students who did not graduate from the University of Toledo need to contact the office of the registrar at their undergraduate institution to arrange for transmission of their undergraduate transcripts. All students from non-English speaking countries must submit proof of English language proficiency.

Students applying to the program without a B.S. in engineering will be required to have a least:

- calculus through ordinary differential equations (2 semesters);
- physics (2 semesters);
- chemistry and/or engineering materials (1 semester); and
- any three out of the following six: statics, dynamics, electronics, electric circuits, fluid mechanics, or thermodynamics.

Students lacking one or more of the above courses must take the necessary courses before entering the program. Contact the program director to determine appropriate courses to meet program prerequisites.

Students can apply for non-degree student status and take up to 9 credit hours of graduate level coursework that may be applied to their graduate degree program. Students with non-degree status in good academic standing can be admitted as regular graduate students at a later date.

For additional information regarding this program, please consult the College of Engineering's Web site at http://www.utoledo.edu/engineering/graduate-studies/energyengineering.html or contact t (EnergyEngineering@eng.utoledo.edu)he program director.

DEGREE REQUIREMENTS

The Master of Science in engineering program with a concentration in energy engineering is comprised of 30 credit hours. The project option

requires the completion of a minimum of 24 credit hours of approved graduate-level course work (nominally 8 courses) and a six-hour practice-oriented project in consultation with their advisor, for a total of 30 credit hours. The coursework option requires the completion of at least 30 credit hours of approved graduate-level course work (nominally 10 courses).

Additionally, all students are expected to complete the following requirements to obtain the Master of Science in Energy Engineering degree program at the University of Toledo:

Code	Title	Hours
Energy Engineering Core Courses		
Minimum of four courses		12
GNEN 6200	Environmental Efficiency for Buildings	
GNEN 6300	Energy Management for Facilities	
EECS 5240	Power Systems Operation	
EECS 5460	Power Systems Management	
EECS 5480	Power Electronics 1	
MIME 5410	Alternative Energy	
MIME 5820	Sustainability Analysis and Design	
MIME 5980	Special Topics	
Business Core Courses		
Minimum of one course		3
ACCT 5000	Financial And Managerial Accounting	
ACCT 5100	Data Analytics in Accounting	
BLAW 6100	Business, Government And Society	
BUAD 6300	Strategic Marketing And Analysis	
BUAD 6600	Supply Chain Management	
BUAD 6800	Information Technology And E-Business	
EFSB 6590	New Venture Creation	
FINA 5310	Managerial Finance and Economics	
Engineering Electives		
Minimum of two courses		6
CIVE 5690	Sustainability Engineering	
GNEN 5500	Applications of Engineering Analysis	
GNEN 5700	Applied Probability and Statistics	
GNEN 6700	Management of Projects and Technological Innovation	
EECS 5260	Control Systems Design	
MIME 5080	Operations Research I	
MIME 6980	Special Topics	
Capstone Option - Work Related Project or Coursework		
Work Related Project Option		9
GNEN 6920	Special Projects in Engineering (6 cr hr)	
Any course from those listed above (3 cr hr)		
Coursework Only Option		9
Any three courses from those listed above (9 cr hr)		

Students may meet their coursework requirements by completing the requirements above, as well as any of the approved elective courses in consultation with their academic advisor. Elective courses may be taken on campus or via distance learning. Several graduate offerings from the College of Engineering, the College of Business and Innovation and the College of Law are available for selection.

Students following the coursework only option may take up to 6 hours of approved independent study toward the 30 credit hours requirement. Students will find it possible to complete the degree requirements in five semesters or less, depending on academic backgrounds and course loads. If students choose the project option, they may complete the course requirements in four semesters by taking two recommended courses per semester and completing the project in one or two semesters. The six-credit (6 hrs.) project for fulfillment of the project option may be carried out in coordination with the student's employer utilizing skills learned in this program. Students should consult their advisor regarding this option.

For transfer credit, students should refer to the general policies of the College of Graduate Studies. Students may use no more than nine credit hours earned at another university with a grade of B or better toward the Master of Science in engineering, and in no case may the project be satisfied by work already completed at another institution or on the job.

To be awarded the Master of Science in engineering degree, the student must have at least a B average (minimum GPA of 3.0/4.0) for all graduate course credits in the program as well as for their entire graduate transcript. Only credit hours obtained with a letter grade of "C" or higher, or an "S" grade for the limited number of classes offered on a satisfactory or unsatisfactory basis, will fulfill degree requirements.

First Year		Hours
Fall semester		
EECS 5480	Power Electronics 1	3
MIME 5410	Alternative Energy	3
Spring Semester		
EECS 5240	Power Systems Operation	3
GNEN 6200	Environmental Efficiency for Buildings	3
	Hours	**12**
Second Year		
Fall semester		
ACCT 5000	Financial And Managerial Accounting	3
CIVE 5690	Sustainability Engineering	3
Spring semester		
GNEN 5500	Applications of Engineering Analysis	3
GNEN 5700	Applied Probability and Statistics	3
	Hours	**12**
Third Year		
Fall semester		
EECS 5460	Power Systems Management	3
GNEN 6700	Management of Projects and Technological Innovation	3
	Hours	**6**
	Total Hours	**30**

- PLO 1. Students will obtain a comprehensive understanding of critical engineering concepts.

- PLO 2. Students will obtain proficiency in advanced topics of mathematics and statistics.
- PLO 3. Students will obtain proficiency in topics in business including accounting, business law, and operations management.
- PLO 4. Students will be able to apply technical solutions to global and societal issues.

Department of Bioengineering

Brent D. Cameron, chair
Halim Ayan, graduate program director

Bioengineering is a relatively new discipline with rapidly growing job opportunities. Bioengineers apply engineering and life science principles to study, understand, modify and control biological systems. The goal of bioengineering is to develop new technologies and techniques that can be applied to a variety of problems in medicine and in the manufacturing of bio-related products.

Achievement of these goals requires engineering graduates who are trained in both engineering and the life sciences. The programs in bioengineering are multidisciplinary in nature as they draw on faculty resources, collaborative research programs, and course offerings throughout the College of Engineering, the College of Natural Sciences and Mathematics, the College of Pharmacy and Pharmaceutical Sciences, and the College of Medicine and Life Sciences. The current areas of faculty research in the department include artificial intelligence, biofuels, biomaterials, biomedical optics, biomimetic assay development, biosensing, cellular and orthopedic biomechanics, computational biology, drug discovery and delivery platforms, medical imaging, microfluidics, plasma medicine, and tissue engineering.

The graduate programs in the Department of Bioengineering are open to all qualified individuals with a Bachelor of Science (B.S.) or Master of Science (M.S.) in Engineering. Students with a B.S./B.A. or M.S./M.A. degree in a related field are also eligible but students may be required to complete prerequisite courses without graduate credit.

Degrees Offered

- M.S. in Bioengineering (p. 18)
- Ph.D. in Biomedical Engineering (p. 20)

COURSES

BIOE 5200 Physiology And Anatomy For Bioengineers
[3 credit hours]
Review and study of general physiological principles and bioengineering perspectives of the human circulatory, respiratory, digestive, immune, nervous, muscular and excretory systems.
Term Offered: Spring, Fall

BIOE 5260 Medical Imaging Systems I
[3 credit hours]
An introduction to the physical principles, design and function of x-ray based diagnostic imaging systems, including radiographic, fluoroscopic and computer tomography (CT) systems.
Prerequisites: MIME 6000 with a minimum grade of C or MIME 8000 with a minimum grade of C
Term Offered: Spring, Fall

BIOE 5620 Cellular Electrophysiology
[3 credit hours]
The generation of electrical impulses by ion channels in excitable tissues. Models of ion channel gating include the Hodgkin-Huxley equations and Markov models. Principles of electrodiffusion applied to ionic flow through open channels.
Term Offered: Spring

BIOE 5650 Bioseparations
[3 credit hours]
Introduction to, analysis and industrial design of processes required to separate and purify proteins and other biological compounds for the downstream processing of bioreactor products. The separations techniques will include filtration, chromatography and crystallization.
Prerequisites: BIOE 3400 with a minimum grade of D- or CHEE 3120 with a minimum grade of D-
Term Offered: Fall

BIOE 5710 Biomechanics of Soft and Hard Materials
[3 credit hours]
Composite and hierarchical models of bone remodeling models presented. Soft tissue models include linear and nonlinear viscoelasticity, Fung's quasilinear viscoelastic theory. Biphasic and triphasic models and mechano-ionic interactions.
Term Offered: Fall

BIOE 5730 Computational Bioengineering
[3 credit hours]
Introduction to and utilization of computational packages for bioengineering applications. Introduction to finite element analysis and applications in biochemical, biofluidics, bioheat transfer, optimization.
Prerequisites: (BIOE 3110 with a minimum grade of D- and BIOE 1200 with a minimum grade of D-)
Term Offered: Spring, Fall

BIOE 5740 Tissue Engineering
[3 credit hours]
Application of principles from engineering and the life sciences toward the development of biological substitutes that restore, maintain or improve tissue function.
Prerequisites: (BIOE 2200 with a minimum grade of D- and BIOE 4100 with a minimum grade of D-)
Term Offered: Spring, Summer, Fall

BIOE 5750 Experimental Methods In Orthopedic Biomechanics
[3 credit hours]
The theory and implementation of techniques used for the measurement of forces and motion within the musculoskeletal system at the system, organ and tissue levels.
Prerequisites: BIOE 3110 with a minimum grade of D- or CIVE 1160 with a minimum grade of D-
Term Offered: Spring, Fall

BIOE 5780 Advanced Biomechanics
[3 credit hours]
Three-diminsional analysis and measurement of human body motions. Applications to gait analysis, physical therapies, and impact analysis. Includes total hip and knee replacement: elbow, shoulder, wrist and finger arthrophasty: bone plates, hip fracture fixation devices, and external fixators.
Term Offered: Spring, Fall

BIOE 5830 Additive Manufacturing
[3 credit hours]
Additive manufacturing (AM) is a method of manufacturing that has been growing rapidly. In this course the students will learn about various AM technologies. They will also work with the required design software packages to create 3D models and 3D-print objects from the designed models.
Prerequisites: MIME 2650 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

BIOE 5930 Bioengineering Seminar
[0 credit hours]
Presentations of ongoing research in the field of bioengineering. Includes presentations by guest speakers, faculty and graduate students.
Term Offered: Spring, Fall

BIOE 5980 Special Topics In Bioengineering
[1-5 credit hours]
Selected subjects in the field of bioengineering with intensive investigation of the recent literature in a few areas of special interest to the class and the professor.
Term Offered: Spring, Summer, Fall

BIOE 5990 Independent Study In Bioengineering
[1-6 credit hours]
The student, under the guidance of their research adviser, explores in-depth specific areas or topics related to their thesis or dissertation research.
Term Offered: Spring, Summer, Fall

BIOE 6100 Computational Physiology
[3 credit hours]
Application of mathematical and computational techniques to physiological systems. Models include conductive cables and compartmental models of nerve fibers, nonlinear differential equation models of electrophysiology, and stochastic models of biomolecular interactions.
Prerequisites: (MIME 6000 with a minimum grade of C or MIME 8000 with a minimum grade of C) and (BIOE 4100 with a minimum grade of C or BIOE 5200 with a minimum grade of C)
Term Offered: Spring

BIOE 6310 Cell and Tissue Engineering Laboratory
[3 credit hours]
The application of engineering principles to the design and analysis of biological processes that employ living organisms or biochemicals.
Term Offered: Spring

BIOE 6520 Orthopaedic Biomechanics
[3 credit hours]
The course of orthopaedic biomechanics has been designed to fuse the biological and physiological problems with the science and technology of engineering. It focuses on a brief review of the physiology and biology of the human body, introduces the physics of manual industrial activities.
Prerequisites: BIOE 4110 with a minimum grade of D- and BIOE 5780 with a minimum grade of D-
Term Offered: Spring

BIOE 6920 Bioengineering Project
[1-6 credit hours]
The student performs a special project of an advanced nature in bioengineering. The course is primarily intended for students pursuing a Masters degree with the project option in Bioengineering.
Term Offered: Spring, Summer, Fall

BIOE 6960 Bioengineering Research And Thesis - Master's
[1-9 credit hours]
Graduate thesis research. The student completes and defends a written thesis under the direction and guidance of their faculty research adviser.
Term Offered: Spring, Summer, Fall

BIOE 6970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the master's/doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

BIOE 7260 Medical Imaging Systems I
[3 credit hours]
An introduction to the physical principles, design and function of x-ray based diagnostic imaging systems, including radiographic, fluoroscopic and computer tomography (CT) systems.
Prerequisites: MIME 6000 with a minimum grade of C or MIME 8000 with a minimum grade of C
Term Offered: Spring, Fall

BIOE 7930 Bioengineering Seminar
[0 credit hours]
Presentations of ongoing research in the field of bioengineering. Includes presentations by guest speakers, faculty and graduate students.
Term Offered: Spring, Fall

BIOE 7980 Special Topics In Bioengineering
[1-5 credit hours]
Selected subjects in the field of bioengineering with intensive investigation of the recent literature in a few areas of special interest to the class and the professor.
Term Offered: Summer

BIOE 7990 Independent Study In Bioengineering
[1-6 credit hours]
The student, under the guidance of their research adviser, explores in-depth specific areas or topics related to their thesis or dissertation research.
Term Offered: Spring, Summer, Fall

BIOE 8100 Computational Physiology
[3 credit hours]
Application of mathematical and computational techniques to physiological systems. Models include conductive cables and compartmental models of nerve fibers, nonlinear differential equation models of electrophysiology, and stochastic models of biomolecular interactions.
Prerequisites: (MIME 6000 with a minimum grade of C or MIME 8000 with a minimum grade of C) and (BIOE 4100 with a minimum grade of C or BIOE 5200 with a minimum grade of C)
Term Offered: Spring

BIOE 8310 Cell and Tissue Engineering Laboratory
[3 credit hours]
The application of engineering principles to the design and analysis of biological processes that employ living organisms or biochemicals.
Term Offered: Spring

BIOE 8520 Orthopaedic Biomechanics
[3 credit hours]
The course of orthopaedic biomechanics has been designed to fuse the biological and physiological problems with the science and technology of engineering. It focuses on a brief review of the physiology and biology of the human body, introduces the physics of manual industrial activities.
Prerequisites: BIOE 4110 with a minimum grade of D- and BIOE 5780 with a minimum grade of D-
Term Offered: Spring

BIOE 8960 Bioengineering Dissertation
[1-9 credit hours]
Original investigations of significant bioengineering problems at the graduate level under the guidance of a member of the faculty.
Term Offered: Spring, Summer, Fall

BIOE 8970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the master's/doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

BME 8900 Independent Research
[1-16 credit hours]
[1-16 hours] Selected topics from current BME research with investigation into recent literature and/or via a laboratory experience in an area of mutual interest to the student and the instructor. Students are to use the section number of their instructor. Prerequisite: Instructor consent.
Term Offered: Spring, Summer, Fall

BME 8960 Dissertation Research
[1-9 credit hours]
[1-16 hours] Doctoral dissertation research credit hours for students in the biomedical engineering program. Students are to use the section number of their dissertation adviser.
Term Offered: Spring, Summer, Fall

BME 8970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

BME 8980 Special Topics
[1-8 credit hours]
[1-8 hours] A special topic at the graduate level in biomedical engineering to be offered as a lecture course during a term by a BME faculty member. Prerequisite: Consent of the BME faculty member.
Term Offered: Spring, Summer, Fall

M.S. in Bioengineering

OVERVIEW

Bioengineers work at the interface of engineering and living systems. At UToledo, our master's program provides key training in focused areas. For example, learn how to design, build, and test medical devices; build computational models to predict joint loading and surgical intervention outcomes; or develop sensors to better detect physiological signals – all to improve the human condition. The possibilities are endless. Please see our department website for details regarding faculty research areas. Our master's-level graduates often transition to successful careers in a range of bio-industries or continue on to pursue Ph.D. or M.D. degrees.

ADMISSIONS REQUIREMENTS

The MS graduate programs in the Department of Bioengineering are open to all qualified individuals with a Bachelor of Science (B.S.) or Master of Science (M.S.) in Engineering. Students with a B.S., B.A., or M.S./M.A. degree in a related field are also eligible provided they meet the minimum prerequisite coursework requirement of two (2) years of calculus through differential equations, and one (1) year of engineering physics.

To be competitive for admission, all applicants should have a grade point average of at least 3.0/4.0 for all previous undergraduate work and 3.3/4.0 for all previous graduate work. In some cases, additional prerequisite courses related to the program of study may be required (see Provisional Admission). Course credits for meeting undergraduate prerequisites are not applied toward the graduate degree.

The GRE exam is required for all students who do not hold a B.S. degree from a US institution, and international students are expected to complete the TOEFL exam. The minimum scores for the GRE are set by the Department of Bioengineering; the minimum scores for the TOEFL exam are set by the College of Graduate Studies. The minimum scores considered are:

- GRE - 300 combined for the verbal and quantitative sections
- TOEFL - 550 (PBT); 80 (IBT)

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from an accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Required for applicants whose B.S. degree is from a non-US institution.
- **Transcripts:** Required
- **Statement of Purpose:** Required

- **Letters of Recommendation:** 3
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** January 15
- **Spring:** October 1
- **Summer:** Contact Department

PROGRAM REQUIREMENTS

The Master of Science program in bioengineering has three options:

- thesis,
- project and
- coursework.

The thesis option requires the completion of a minimum of 21 credit hours of approved graduate course work, 9 hours of thesis research and the successful defense of a research-based thesis. The project option requires the completion of a minimum of 24 credit hours of approved graduate course work and 6 hours of project research. The coursework option requires the completion of at least 30 hours of approved graduate course work only. All course work must be approved by the student's adviser (or the graduate director). The M.S. curriculum is designed to provide a general, flexible framework for students in selecting course work that is relevant to their specific area of research. Each student must meet the following minimum general course work requirements:

Code	Title	Hours
Required coursework		**6**
BIOE 5200	Physiology And Anatomy For Bioengineers	3
or BIOE 6100	Computational Physiology	
MIME 6000	Advanced Engineering Mathematics I	3
BIOE 5930	Bioengineering Seminar (Register and attend every semester)	0
Elective coursework		**15-24**
Elective coursework cr hr requirements depend on capstone option. Up to 6 cr hr may be entrepreneurship elective coursework. All remaining coursework must be engineering, mathematics, or science-based. Elective coursework options include, but are not limited to, the courses listed below.		
BIOE 5260	Medical Imaging Systems I	3
BIOE 5650	Bioseparations	3
BIOE 5730	Computational Bioengineering	3
BIOE 5740	Tissue Engineering	3
BIOE 5780	Advanced Biomechanics	3
BIOE 5830	Additive Manufacturing	3
BIOE 6310	Cell and Tissue Engineering Laboratory	3
BIOE 6520	Orthopaedic Biomechanics	3
MIME 5280	Cad - Finite Element Methods	3
MIME 5460	MATLAB and C/C++ for Engineers	3
MIME 6650	Advanced Material Science and Engineering	3
CHEE 6120	Biofuels	3
BIOL 6300	Advanced Microscopy and Imaging	3
EFSB 6590	New Venture Creation	3
EFSB 6690	Strategic Management of Innovation	3
Capstone option		
Thesis option:		
BIOE 6960	Bioengineering Research And Thesis - Master's	9
Elective coursework		15
Project option:		
BIOE 6920	Bioengineering Project	6
Elective coursework		18
Coursework option		
Elective coursework		24

Combined bachelor's to master's- BS to MS Bioengineering

Undergraduate students accepted to the BS to MS Bioengineering option will be admitted to the MS in Bioengineering and allowed to complete up to three graduate level classes (nine credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in to the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) BIOE 5200, BIOE 5620, BIOE 5740, BIOE 5830, BIOE 5780, BIOE 5650 and other elective coursework as approved by the Undergraduate and Graduate Program Directors may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

- PLO 1) Solve problems using advanced mathematics, engineering and biomedical sciences
- PLO 2) Communicate research rationale and results in scientific presentations and refereed publications
- PLO 3) Independently design and conduct laboratory research
- PLO 4) Lead research or project teams with direction from supervisors

Ph.D. in Biomedical Engineering

OVERVIEW

Patricia Relue, Program Co-Director from the College of Engineering
Kandace Williams, Program Co-Director from the College of Medicine and Life Sciences

The Doctor of Philosophy in Biomedical Engineering at the University of Toledo is a joint program between the College of Engineering and the College of Medicine and Life Sciences. The program is open to qualified students with B.S. degrees in engineering or in science fields such as biology, chemistry, physics, mathematics, or computer science. Since prospective students have a variety of backgrounds, the requirements for admission vary.

The degree is conferred based on high scholarly attainment in the field of biomedical engineering. This program incorporates a formal entrepreneurship component in collaboration with the College of Business and Innovation (COBI) to encourage Ph.D. students to commercialize the biomedical technology they may develop as part of their dissertation research. The curriculum also provides a Ph.D. program for M.D. students from undergraduate engineering backgrounds that are interested in pursuing a dual degree and careers as physician scientists.

ADMISSIONS REQUIREMENTS

The entrance requirement for the PhD program in Biomedical Engineering is the B.S. degree in engineering or in science fields such as biology, chemistry, physics, mathematics, or computer science. Students with non-engineering undergraduate degrees desiring entry into this PhD program must have completed 1 year of engineering physics; 1 year of biology; 1 year of general chemistry; 2 years of calculus through differential equations; and at least 12 semester credit hours of undergraduate engineering/science course work (appropriate to the area of research interest of the candidate) to be considered for admission. Credit received for undergraduate coursework required for admission will not be applied toward the graduate degree.

To be competitive for admission, all applicants should have a grade point average of at least 3.0/4.0 for all previous undergraduate work and 3.3/4.0 for all previous graduate work. In some cases, additional prerequisite courses related to the program of study may be required (see Provisional Admission). Course credits for meeting undergraduate prerequisites are not applied toward the graduate degree.

The GRE exam is required for all students who do not hold either a B.S. or M.S. degree from a US institution; international students are required to provide proof of English language proficiency. Minimum accepted scores for the GRE are set by the program faculty; minimum scores for the English language proficiency exams are set by the College of Graduate Studies.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from an accredited college or university
- **GPA:**Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Required for applicants whose B.S. or M.S. degree is from a non-US institution. Minimum scores are 300 combined for the verbal and quantitative sections.
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 3
- **Proof of English language proficiency:**Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** January 15
- **Spring:** October 1
- **Summer:** January 15

Program Requirements

In addition to coursework requirements, continuation within the Ph.D. program requires that the student pass two major examinations:

1. Ph.D. Qualifying Exam and
2. Dissertation Research Proposal defense.

Completion of the Ph.D. degree requires the writing and defense of the Dissertation and the writing of a business commercialization plan and/or publication of the research findings.

CURRICULUM

A minimum of 90 semester credit hours of approved graduate coursework are required beyond the B.S. degree. For students directly admitted into the Ph.D. program with a B.S. degree, the minimum coursework requirements specified below must be satisfied.

- Register and attend a weekly seminar series in the College of Engineering or the College of Medicine and Life Sciences. Registration and attendance is mandatory every semester.
- Complete 13 hours of core coursework.
- Complete 12 hours of engineering/life sciences elective coursework.
- Complete 3-6 hours of entrepreneurship elective coursework.
- Complete 15 hours of other engineering/science elective coursework.
- Complete at least 45 semester hours of dissertation research. A student can register for dissertation research only after passing the *Qualifying Exam*.

In order to be awarded the PhD in Biomedical Engineering degree, the student must have at least a B average (a minimum GPA of 3.0/4.0) for all

graduate course credits in the program of study as well as for the entire graduate transcript. Only credit hours obtained with a letter grade of "C" or higher, or an "S" grade for the limited number of classes offered on a satisfactory or unsatisfactory basis, will fulfill degree requirements.

The core courses include the following:

Code	Title	Hours
BIOE 8100	Computational Physiology	3
A math course at the 7000 or 8000 level as a prerequisite for the mathematics core course		3
MIME 8100	Advanced Engineering Mathematics II	3
or MATH 8510	Partial Differential Equations	
INDI 8020	On Being a Scientist	1
Select at least three credit hours from the following:		3
BMSP 8340	Curr Prob Res App Genes/Genome	
BMSP 8350	Cell Biology & Signaling	
BMSP 8360	Curr Prob Cell Membranes	
MPHY 8040	Diag Radiological Physics (or equivalent)	

Students emphasizing the biological sciences must complete at least 5 credit hours of biomedical sciences program (BMSP) courses.

The Ph.D. in Biomedical Engineering includes an entrepreneurial component which is nurtured through close interaction with the COBI. Each student in this degree program completes the course EFSB 6590 New Venture Creation as part of the approved elective coursework. Students may also elect to complete the additional graduate level COBI course EFSB 6690 Technology Commercialization.

Qualifying Examination

The Qualifying Examination is an oral exam used to assess a student's critical thinking skills and understanding of the foundational material essential for success in the doctoral program. For students accepted into the Ph.D. program, the Ph.D. Qualifying Exam will occur after the completion of the required first year coursework comprising the core courses in physiology, mathematics and the courses from the College of Medicine and Life Sciences. The students rotate through 3 different examination topics which are mediated by 2-3 faculty members. Each testing topic lasts no more than 25 minutes; each student is asked questions of increasing difficulty until the perimeter of the student's knowledge is determined. All students are tested on the common areas of mathematics and physiology. Each student selects the third test segment from the three broad specialization areas of biomechanics, bioprocessing/molecular & cellular biology, and bioelectrical systems.

Following the finalization of the examination outcomes, the Program Co-Director immediately notify the students tested in writing of the testing outcome. If retesting is required, the student is also informed of the date of testing and the topic(s) to be retested. Students who do not receive an outright pass on the first examination have one opportunity to retest with a passing score or are dismissed from the program.

Ph.D. Dissertation Committee

Following the successful completion of the Qualifying Examination, students are expected to form their dissertation committees with the advice and consent of their research advisors. Each committee must consist of at least five UT Graduate Faculty. Affiliated Faculty must constitute the majority on each committee. Each committee must include at least one Affiliated Faculty member from the College of Engineering, one from the College of Medicine and Life Sciences, and one external faculty member usually from the College of Business and Innovation.

Doctoral Candidacy

All doctoral students must meet the following requirements before being admitted to doctoral candidacy:

- Pass the Biomedical Engineering Qualifying Examination
- Select a dissertation committee
- Obtain at least a 3.0/4.0 for all graduate level coursework

Prior to initiating dissertation research, each student must complete and file a Graduate Research Advisory Committee Approval and Assurances Form (GRAD) with the College of Graduate Studies. Students must complete this form and receive the required approvals prior to beginning any research for a thesis involving humans, animals, radiation, or bio hazardous substances.

Dissertation Research Proposal Examination

The dissertation research proposal is a document written by the student describing the research to be undertaken for the dissertation. The oral examination consists of the presentation of the written proposal by the student to the dissertation committee in a closed forum. The dissertation research proposal must be written and presented within one calendar year of passing the Qualifying Examination. A student may request an extension of up to one additional calendar year with the approval of the faculty advisor.

The dissertation research proposal should describe the background, goals, hypotheses, and general methods of the proposed research. The proposal should be structured in a manner similar to an NIH grant application. Copies of the proposal must be given to all members of the dissertation committee at least two weeks before the oral presentation. The dissertation proposal must then be formally presented to the dissertation committee and defended to their satisfaction.

Entrepreneurship Component

Each student will integrate his/her COBI coursework with his/her research discoveries and submit a formal business plan to commercialize the dissertation research. This plan must be presented and approved by the dissertation committee prior to the final approval of the dissertation. The committee, which includes one faculty member from the COBI, may seek the advice of others in evaluating the submitted plan.

In recognition of the fact that some students will focus on more fundamental scientific research which may have limited commercial value, a student may request from the dissertation committee a substitution of the business plan by a research equivalent of this requirement. An example of such an equivalent requirement would be evidence of submission and/or publication of two peer-reviewed journal articles.

Ph.D. Dissertation and Defense

When the dissertation research is completed to the satisfaction of the faculty advisor, the student prepares a complete draft of the Ph.D. dissertation. The student must submit the final draft of the dissertation to each committee member for his or her critical evaluation and review at least two (2) weeks prior to the defense. The dissertation defense consists of a 45 minute formal oral presentation by the student, followed by open and closed question sessions. The dissertation committee then votes, and a majority of the committee must concur on the final decision. If the student does not pass the dissertation defense, then the dissertation committee, in consultation with the Program Director, will decide a course of future action.

Time Limit

Doctoral candidacy automatically terminates five (5) years after admission to candidacy. All requirements for the doctoral degree must be completed within seven (7) years of admission to the Ph.D. program (registration for first doctoral level class). To continue beyond the time limit, a written request for extension to the research advisor and the two Co-Directors of the Biomedical Engineering Committee must be submitted and approved. Upon approval through the required channels of The College of Engineering, the extension request must be forwarded to The College of Graduate Studies for final review and approval.

- PLO 1. Solve problems using advanced mathematics, engineering and biomedical sciences
- PLO 2. Communicate research rationale and results in scientific presentations, grant proposals, patents and refereed publications
- PLO 3. Identify research questions and commercialization opportunities in biomedical research
- PLO 4. Independently design, conduct and direct laboratory research
- PLO 5. Lead research or project teams without additional supervision
- PLO 6. Review scientific literature to identify and obtain rationale for new research areas
- PLO 7. Teach undergraduate engineering courses

Department of Chemical Engineering

Yakov Lapitsky, chair
Maria Coleman, graduate director

The Department of Chemical Engineering offers graduate courses and conducts research in the areas of advanced materials, alternative energy, biomass conversion to chemicals and materials, polymer science and engineering, and membrane science and engineering. Students may select from a variety of courses and research topics in each area. The department offers two graduate degrees, a Master of Science in Chemical Engineering (M.S.Ch.E.) and a Doctor of Philosophy in Engineering (Ph.D.).

Faculty are developing processes for the conversion of biomass to chemicals and materials, including polymers and fuels. Advanced materials and complex fluid formulations are being developed for application in catalysis, drug delivery, energy, home/personal care products, nanosensors, and nanocomposites. Packaging is the focus of work in polymer science and engineering, especially the development of sustainable packaging materials with enhanced barrier properties for product preservation and improved recyclability. This work is conducted largely through the University's Polymer Institute. Finally, membrane materials and processes are being developed for desalination, wastewater treatment, carbon dioxide capture, and energy production.

Degrees Offered

- M.S. in Chemical Engineering (p. 24)
- Ph.D. in Engineering (Chemical Engineering) (p. 26)

COURSES

CHEE 5410 Bioseparations
[3 credit hours]
Introduction to, analysis and industrial design of processes required to separate and purify proteins and other biological compounds for the downstream processing of bioreactor products. The separations techniques will include filtration, chromatography and crystallization.
Prerequisites: BIOE 3400 with a minimum grade of D- or CHEE 3120 with a minimum grade of D-
Term Offered: Fall

CHEE 5800 Polymer Science And Engineering
[3 credit hours]
Polymerization processes, characterization, structure and properties of polymers, processing and engineering applications of the major polymer types.
Term Offered: Fall

CHEE 5930 Seminars in Chemical Engineering
[0-1 credit hours]
Research topics of current interest to chemical engineers will be presented by internal and external speakers in a research seminar format.
Term Offered: Spring, Fall

CHEE 6010 Green Engineering Principles
[3 credit hours]
The principles of chemical process analysis and design are introduced for the development of green engineering processes. Common components of chemical processes are reviewed and quantitative analyses of process performance and economics developed. The impact of design variables on materials and energy usage is demonstrated.
Term Offered: Fall

CHEE 6110 Green Engineering Applications
[3 credit hours]
Applications of green engineering principles in the chemical industry are discussed. Metrics for comparing process options are introduced along with common techniques for improving process performance.
Prerequisites: CHEE 6010 with a minimum grade of C
Term Offered: Spring

CHEE 6120 Biofuels
[3 credit hours]
The technical, economic, social, and political issues associated with energy consumption are discussed. The potential for biofuels to replace current energy sources is examined based on the historical evolution of the industry and current research activity.
Term Offered: Spring

CHEE 6500 Advanced Chemical Reaction Engineering
[3 credit hours]
Analysis of kinetic, diffusive and flow factors on chemical reactor performance. Topics include batch, plug flow and CSTR reactors, empirical rate expressions, residence time distributions, catalytic reactors, stability and optimization, analysis of catalytic reaction rate expressions.
Term Offered: Spring, Fall

CHEE 6510 Advanced Chemical Engineering Thermodynamics
[3 credit hours]
Advanced treatment of fundamental principles of thermodynamics, especially as related to calculation of phase equilibria. Topics include intermolecular potentials, excess functions, theories of solutions, high-pressure equilibria and introductory statistical mechanics.
Term Offered: Spring, Fall

CHEE 6550 Advanced Fluid Mechanics
[3 credit hours]
Students learn how to formulate and solve engineering problems involving momentum transfer from the microscopic view. Topics include vector/tensor analysis, approximation methods, computational solutions and non-Newtonian fluid phenomena.
Term Offered: Spring, Fall

CHEE 6560 Advanced Heat and Mass Transfer
[3 credit hours]
Students learn how to formulate and solve engineering problems involving simultaneous momentum, heat and mass transfer from the microscopic view. Topics include conduction, radiation, diffusion, forced convection and free convection.
Term Offered: Spring, Fall

CHEE 6860 Polymer Laboratory Methods
[3 credit hours]
Characterization of polymers by physical testing (tensile, creep and rheological), physicochemical methods (viscosity, gel permeation chromatography), thermal analysis, spectroscopy, light microscopy, permeation, density, light scattering and processing.
Term Offered: Spring, Fall

CHEE 6920 Chemical Engineering Project
[1-6 credit hours]
Students will perform a special project of an advanced nature in Chemical Engineering under the supervision of a faculty advisor. The project will culminate in submission of a written report. The course is intended primarily for Masters students pursuing a project Masters in Chemical Engineering.
Term Offered: Spring, Summer, Fall

CHEE 6960 Master's Graduate Research And Thesis
[1-9 credit hours]
Graduate research towards the completion of a Master's Degree.
Term Offered: Spring, Summer, Fall

CHEE 6970 Graduate Engineering Internship
[1-6 credit hours]
Academic advisor approved industrial or non-profit internship to provide an experiential learning component to the Master's/ doctoral degree program.
Prerequisites: GNEN 5000 (may be taken concurrently) with a minimum grade of S
Term Offered: Spring, Summer, Fall

CHEE 6980 Special Topics In Chemical Engineering
[1-6 credit hours]
Selected topics from current chemical engineering research with intensive investigation into the recent literature in an area of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

CHEE 6990 Independent Study In Chemical Engineering
[1-6 credit hours]
The student, under the guidance of their research advisor, explores in-depth specific areas or topics related to their project, thesis, or dissertation research, or other academic interests.
Term Offered: Spring, Summer, Fall

CHEE 8010 Green Engineering Principles
[3 credit hours]
The principles of chemical process analysis and design are introduced for the development of green engineering processes. Common components of chemical processes are reviewed and quantitative analyses of process performance and economics developed. The impact of design variables on materials and energy usage is demonstrated.
Term Offered: Fall

CHEE 8110 Green Engineering Applications
[3 credit hours]
Applications of green engineering principles in the chemical industry are discussed. Metrics for comparing process options are introduced along with common techniques for improving process performance.
Prerequisites: CHEE 8010 with a minimum grade of C
Term Offered: Spring

CHEE 8120 Biofuels
[3 credit hours]
The technical, economic, social, and political issues associated with energy consumption are discussed. The potential for biofuels to replace current energy sources is examined based on the historical evolution of the industry and current research activity.
Term Offered: Spring

CHEE 8500 Advanced Chemical Reaction Engineering
[3 credit hours]
Analysis of kinetic, diffusive and flow factors on chemical reactor performance. Topics include batch, plug flow and CSTR reactors, empirical rate expressions, residence time distributions, catalytic reactors, stability and optimization, analysis of catalytic reaction rate expressions.
Term Offered: Spring, Fall

CHEE 8510 Advanced Chemical Engineering Thermodynamics
[3 credit hours]
Advanced treatment of fundamental principles of thermodynamics, especially as related to calculation of phase equilibria. Topics include intermolecular potentials, excess functions, theories of solutions, high-pressure equilibria and introductory statistical mechanics.
Term Offered: Spring, Fall

CHEE 8550 Advanced Fluid Mechanics
[3 credit hours]
Students learn how to formulate and solve engineering problems involving momentum transfer from the microscopic view. Topics include vector/tensor analysis, approximation methods, computational solutions and non-Newtonian fluid phenomena.
Term Offered: Spring, Fall

CHEE 8560 Advanced Heat and Mass Transfer
[3 credit hours]
Students learn how to formulate and solve engineering problems involving simultaneous momentum, heat and mass transfer from the microscopic view. Topics include conduction, radiation, diffusion, forced convection and free convection.
Term Offered: Spring, Fall

CHEE 8860 Polymer Laboratory Methods
[3 credit hours]
Characterization of polymers by physical testing (tensile, creep and rheological), physicochemical methods (viscosity, gel permeation chromatography), thermal analysis, spectroscopy, light microscopy, permeation, density, light scattering and processing.
Term Offered: Spring, Fall

CHEE 8960 Doctoral Graduate Research And Dissertation
[1-9 credit hours]
Graduate research towards the completion of a Doctoral Degree.
Term Offered: Spring, Summer, Fall

CHEE 8970 Graduate Engineering Internship
[1-6 credit hours]
Academic advisor approved industrial or non-profit internship to provide an experiential learning component to the Master's/ doctoral degree program.
Prerequisites: GNEN 5000 (may be taken concurrently) with a minimum grade of S
Term Offered: Spring, Summer, Fall

CHEE 8980 Special Topics In Chemical Engineering
[1-6 credit hours]
Selected topics from current chemical engineering research with intensive investigation into the recent literature in an area of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

CHEE 8990 Independent Study In Chemical Engineering
[1-6 credit hours]
The student, under the guidance of their research advisor, explores in-depth specific areas or topics related to their project, thesis, or dissertation research, or other academic interests.
Term Offered: Spring, Summer, Fall

M.S. in Chemical Engineering

OVERVIEW

Our chemical engineering M.S. students grow their knowledge through rigorous coursework and perform cutting-edge research that aims to tackle the world's greatest energy, environmental and medical challenges. Current projects range from renewable polymer production, to water purification, to development of nanomaterials for sensing, to hydrogels and complex fluids for regenerative medicine and consumer product formulations. Through their coursework and research, our M.S. students receive training in state-of-the-art experimental and modeling tools to prepare them for leadership roles in industry and government, or further academic study. Most graduates elect to pursue careers in industry, joining diverse companies throughout the United States. Others go on to rewarding careers at nonprofit and government institutions or continue their studies toward Ph.D. degrees.

ADMISSIONS REQUIREMENTS

Admission for graduate studies at The University of Toledo requires a four-year bachelor's degree from an accredited college or university. For all applicants from an accredited U.S. or Canadian university with an undergraduate GPA below 2.7 and for all international applicants from non-English speaking countries, GRE scores must be submitted with a quantitative GRE score of at least 155. For all international applicants from non-English speaking countries, a minimum TOEFL speaking score of 22 (or a minimum IETLS speaking score of 6.5). International students must also demonstrate adequate financial resources for their graduate education before admission.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Required for applicants whose degree is from a non-US institution.
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 3
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** Contact Program
- **Spring:** Contact Program
- **Summer:** Contact Program

Admission of Chemistry Majors

A special program of required pre-requisite courses has been developed for students with a B.S. in chemistry. The plan assumes that two years of undergraduate calculus and one semester of physical chemistry have been completed. Interested students should contact the Graduate Director.

PROGRAM REQUIREMENTS

Students may select one of three Master of Science in Chemical Engineering (M.S. Ch.E.) degree programs: (1) thesis, (2) non-thesis coursework, or (3) non-thesis project options. A Professional Science Master's Track in Green Chemistry and Engineering also is offered.

The thesis Master of Science in Chemical Engineering (M.S. Ch.E.) degree program requires completion of 30 hours of course credit, successful

defense of a thesis and typically takes two years to complete. Minimum requirements are:

Code	Title	Hours
GNEN 5000	Graduate Launch	0
CHEE 6500	Advanced Chemical Reaction Engineering	3
CHEE 6510	Advanced Chemical Engineering Thermodynamics	3
CHEE 6550	Advanced Fluid Mechanics	3
CHEE 6560	Advanced Heat and Mass Transfer	3
Graduate course work		9
Continuous registration and attendance for the Graduate Seminar for full time students		
Thesis work completed to the satisfaction of the thesis committee and successful oral defense of the thesis before the committee in a public forum.		9
Total Hours		**30**

The non-thesis Master of Science options are: course work and project. For the coursework option, students are required to complete 30 credit hours of approved graduate study including:

Code	Title	Hours
CHEE 6500	Advanced Chemical Reaction Engineering	3
CHEE 6510	Advanced Chemical Engineering Thermodynamics	3
CHEE 6550	Advanced Fluid Mechanics	3
CHEE 6560	Advanced Heat and Mass Transfer	3
Graduate course work		18
Total Hours		**30**

For the project option, students are required to complete 30 credit hours of approved graduate study, including six hours of a Master of Science project as specified. Students are required to submit a written project report to the department after approval by the chemical engineering faculty project supervisor. Specific requirements are:

Code	Title	Hours
CHEE 6500	Advanced Chemical Reaction Engineering	3
CHEE 6510	Advanced Chemical Engineering Thermodynamics	3
CHEE 6550	Advanced Fluid Mechanics	3
CHEE 6560	Advanced Heat and Mass Transfer	3
Graduate course work		12
CHEE 6920	Chemical Engineering Project (completed to the satisfaction of the faculty project supervisor)	6
Continuous registration and attendance for the Graduate Seminar for full time students		
Total Hours		**30**

Only credit hours obtained with a letter grade of "C" or higher, or an "S" grade for the limited number of classes offered on a satisfactory or unsatisfactory basis, will fulfill degree requirements. Students must maintain a grade point average (GPA) of 3.0 or above. Additionally, the graduate course work must satisfy the following restrictions:

- No more than six (6) hours of Graduate Seminar (CHEE 5930), independent study, special problems, or special topics
- No more than seven (7) hours in dual level courses; courses with a minority enrollment of selected undergraduates are not restricted
- All courses must be taken at the 5000 level or higher in the College of Engineering, the College of Pharmacy and Pharmaceutical Sciences, the College of Medicine and Life Sciences, or the College of Natural Sciences and Mathematics.

Students should carefully select their courses to enhance their educational background and complement their research activities. Additionally, all students must register for one hour of Seminars in Chemical Engineering, CHEE 5930, each semester during the academic year. This course is graded on a satisfactory/unsatisfactory basis. To receive a grade of "S," students must attend all seminars or provide a written explanation for their absence.

The Professional Science Masters option requires completion of 30 hours of coursework, 6 hours of industrial internship, and typically takes one year to complete. Minimum requirements are:

Code	Title	Hours
CHEM 6200	Green Chemistry	3
CHEM 6210	Environmental Chemistry	3
CHEE 6010	Green Engineering Principles	3
CHEE 6110	Green Engineering Applications	3
BUAD 6600	Supply Chain Management	3
EFSB 6690	Strategic Management of Innovation	3
or EFSB 6590	New Venture Creation	
Elective graduate course work		12
CHEE 6970	Graduate Engineering Internship	6
Total Hours		**36**

Students possessing a Bachelor's degree in Chemical Engineering are required to take three additional hours of elective graduate course work in lieu of CHEE 6010.

The elective graduate course work may come from traditional areas of chemistry and chemical engineering at the 6000 level. Up to four hours of 6000 level course work in a related discipline (e.g., environmental sciences or physics) and up to two hours of independent research project (CHEE 6980) may be applied to the elective graduate course work requirement subject to the approval of the PSM program director. Research seminar (CHEE 5930) cannot be applied towards the elective graduate course work.

Six (6) hours of Graduate Engineering Internship (CHEE 6970) also are required. The Graduate Industrial Internship must be completed at an industry, governmental organization, or non-governmental organization in an area relevant to green chemistry and engineering. The PSM program director will assist in identifying Internship opportunities and must approve all placements. Students who are working or have worked part or full-time in a relevant job may request Internship credit for this work experience. The Director will evaluate all such requests and give credit if appropriate.

Admission of Chemistry Majors

A special program is in place for students who are Chemistry Majors, and it requires them to take required prerequisite courses. The plan assumes that two years of undergraduate calculus and one semester of physical chemistry have been completed. The student should contact the Graduate Director.

- PLO 1. an ability to conduct research or complete engineering projects.
- PLO 2. an ability to communicate technical issues to others.
- PLO 3. an ability to apply knowledge of mathematics, science, and engineering to problem solving.
- PLO 4. an ability to identify, formulate and solve engineering problems.
- PLO 5. an understanding of ethical conduct in engineering research and/or practice.

Ph.D. in Engineering (Chemical Engineering)

OVERVIEW

Our chemical engineering Ph.D. students perform cutting-edge research that aims to tackle the world's greatest energy, environmental and medical challenges. Current projects range from the production of renewable polymers, to water purification, to development of nanomaterials for CO_2 capture, advanced catalysis, and sensing, to hydrogels for regenerative medicine. Our graduate students receive training in state-of-the-art experimental and modeling tools to prepare them for scientific leadership roles in industry, government and academia. Most graduates elect to pursue careers in industry, joining diverse companies throughout the United States. Others go on to prestigious faculty positions at research and teaching universities or pursue rewarding careers at other nonprofit and government institutions.

ADMISSIONS REQUIREMENTS

Admission for graduate studies at The University of Toledo requires a four-year bachelor's degree from an accredited college or university. For all applicants from an accredited U.S. or Canadian university with an undergraduate GPA below 2.7 and for all international applicants from non-English speaking countries, GRE scores must be submitted with a quantitative GRE score of at least 155. For all international applicants from non-English speaking countries, a minimum TOEFL speaking score of 22 (or a minimum IETLS speaking score of 6.5). International students must also demonstrate adequate financial resources for their graduate education before admission.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Required for applicants whose degree is from a non-US institution.
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 3
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** Contact Program
- **Spring:** Contact Program
- **Summer:** Contact Program

PROGRAM REQUIREMENTS

The doctoral degree requires a total of 90 credit hours split equally between course work and dissertation research. However, to be formally admitted to candidacy for the degree, doctoral students must first pass the preliminary and qualifying examinations. After admission to candidacy, the completion of 45 credit hours of course work and 45 credit hours of dissertation research, doctoral candidates must prepare a written dissertation documenting their research efforts. Final approval for graduation is contingent upon a successful oral defense of the dissertation before the dissertation committee in a public forum.

The minimum requirements for the Doctor of Philosophy (Ph.D.) in Engineering are:

Code	Title	Hours
GNEN 5000	Graduate Launch	0
CHEE 8500	Advanced Chemical Reaction Engineering	3
CHEE 8510	Advanced Chemical Engineering Thermodynamics	3
CHEE 8550	Advanced Fluid Mechanics	3
CHEE 8560	Advanced Heat and Mass Transfer	3
Additional graduate course work, including:		33
CHEE 5930	Seminars in Chemical Engineering [1]	
Passage of the preliminary exam		
Passage of the qualifying exam		
Dissertation research (Completed to the satisfaction of the dissertation committee)		45
Total Hours		**90**

[1] All full-time students must register for one hour of CHEE 5930 each semester during the academic year. This course is graded on a satisfactory/unsatisfactory basis. To receive a grade of S, students must attend all seminars or provide a written explanation for their absence

Only credit hours obtained with a letter grade of C or higher, or an S grade for the limited number of classes offered on a satisfactory or unsatisfactory basis will fulfill degree requirements. Students must maintain a grade point average (GPA) of 3.0 or above.

For students admitted with a Bachelor's degree, the graduate course work must satisfy the following restrictions:

- No more than thirty (30) hours of Graduate Seminar (CHEE 5930), independent study, special problems or special topics
- No more than eleven (11) hours in 5000 level courses
- All courses must be taken at the 5000, 7000 or 8000 level in the College of Engineering, the College of Pharmacy, the College of Medicine and Life Sciences, or the Biology, Chemistry, Mathematics, Environmental Sciences, and Physics Departments of the College of Natural Sciences and Mathematics

The faculty may award students admitted with a Master in Chemical Engineering up to 30 hours of credit toward the Ph.D. This may include credit for core classes if the faculty deem classes taken as a Master student are comparable to the core classes. The student must satisfy all other requirements as listed above. Additional course work must satisfy the following restrictions:

- No more than fifteen (15) hours of Graduate Seminar (CHEE 5930), independent study, special problems or special topics.
- No more than four (4) hours in 5000 level courses
- All courses must be taken at the 5000 level or higher in the College of Engineering, the College of Pharmacy, or the Biology, Chemistry, Mathematics, Environmental Sciences, and Physics Departments of the College of Natural Sciences and Mathematics

Preliminary Examinations

The purpose of the preliminary exam is to evaluate whether a student possesses the background necessary to complete doctoral degree requirements. The oral exam is given at the end of the first year for all new doctoral students.

The exam will require the students to formulate and defend a research plan, wherein they will: (1) propose a study (on a topic selected by the student and approved by the advisor) that can result in a peer-reviewed journal publication; (2) submit a 6 – 10 page double-spaced proposal; and (3) deliver a 15 – 20 minute presentation followed by questions. The advisor's role in the proposal and presentation preparation will be limited to approving the proposal topic (i.e., the advisor will not edit or provide feedback on the proposal before its submission/presentation to the faculty). To pass this exam, the candidate must demonstrate the ability to plan a study using appropriate research tools, be able to use chemical engineering principles to defend their research proposal, and exhibit effective written and oral communication skills.

Students either pass or fail the exam. The faculty as a whole will evaluate the results and will consider input from the student's advisor, TA assignment supervisors and classroom instructors to determine the final grade. Students who fail the exam may petition the Department to consider offering a retake of the exam. If permission is not granted, then the exam failure will be final.

Students that enter with a B.S. and ultimately fail the exam are required to complete a Master's degree or leave the program. Students that enter with a M.S. are required to leave the program or pursue another M.S. degree.

Qualifying Exam

The qualifying exam consists of an oral defense of the proposed doctoral research project. The exam must be taken within one calendar year of passage of the preliminary exam. However, a student may petition the Department for extension of this time limit.

The student must submit a written proposal to their dissertation committee at least two weeks prior to the proposed exam date. The proposal should contain the following sections:

1. Project Summary
2. Research Objectives
3. Research Significance
4. Literature Review
5. Research Plan
6. Bibliography
7. Budget

The entire proposal should be prepared using a 12 point font and one inch margins around the page. The project summary should be double spaced and extend not more than one page. Sections 2-5 should also be double spaced and not exceed 20 pages in length. The budget should indicate both monetary and time requirements.

There are no restrictions on the student concerning preparation of the proposal. Students may consult with both faculty and other students, if agreeable.

The oral defense consists of a brief presentation of the proposal, typically 30-45 minutes, followed by a question and answer session. During the exam, the committee will assess the appropriateness of the proposed

project for a doctoral dissertation and the student's ability to successfully complete it; passage indicates that the committee believes the project is suitable and the student can complete it.

If a student fails the exam, they may petition the Department to retake the exam the following term. If permission is not granted, then the exam failure will be final.

Students that enter with a B.S. and ultimately fail the exam are required to complete a Master's degree or leave the program. Students that enter with a M.S. are required to leave the program or pursue another M.S. degree.

Dissertation Defense

After completing all other degree requirements and preparing a final draft of the dissertation, the student may schedule a final defense date with the dissertation committee. The Graduate School provides guidelines for dissertation preparation.

The defense is open to all faculty members of the University. Consequently, the student must submit the defense date to the Graduate School two weeks in advance to permit University-wide notification. At the same time, each committee member should receive a copy of the dissertation draft.

The defense consists of a short oral presentation, 30-45 minutes in length, followed by a question and answer session. During the defense, the committee will evaluate if the student has satisfactorily completed the proposed dissertation research and possesses a Doctoral level understanding of general Chemical Engineering and the particular research area.

If more than one member of the Advisory Committee votes against accepting the dissertation, the student fails the defense. The student may revise the thesis to address the concerns of the committee and request reconsideration. If the student fails upon revision of the dissertation, the student will be dismissed from the program without award of the degree.

- PLO 1. an ability to conduct independent research
- PLO 2. an ability to communicate technical issues to others
- PLO 3. an ability to apply knowledge of mathematics, science, and engineering to problem solving
- PLO 4. an ability to identify, formulate and solve engineering problems
- PLO 5. an understanding of ethical conduct in engineering research

Department of Civil and Environmental Engineering

OVERVIEW

Luis Mata, chair

The graduate students enrolled in the Civil and Environmental Engineering Department can pursue either a Master of Science in Civil Engineering or a Ph.D. in Engineering. The civil and environmental engineering field is very diverse offering research and coursework opportunities in environmental, transportation, structural, and geotechnical engineering. Some current and upcoming areas of research of the department faculty are in trash free waterways, food-energy-water nexus, harmful algal blooms, water treatment, human gut microbiome, artificial intelligence in transportation and structural systems, transportation asset management, resilient structures, composite materials, and landslides due to wildfires. The department welcomes interdisciplinary research; some students are advised by faculty from other departments.

Degrees Offered

- M.S. in Civil Engineering (Civil and Environmental Engineering) (p. 31)
- Ph.D. in Engineering (Civil and Environmental Engineering) (p. 32)

COURSES

CIVE 5300 Advanced Mechanics Of Materials
[3 credit hours]
Introduction to theory of elasticity, plane-stress and plane-strain problems, yield criteria and failure theories, bending of beams, energy methods, curved flexural members, unsymmetrical bending, torsion, shear center and axisymmetrically loaded members.
Term Offered: Spring, Fall

CIVE 5320 Computer-Aided Analysis of Structures
[3 credit hours]
Matrix analysis of continuous beams, trusses and frames by force method and displacement method. Methods of consistent deformation and slope deflection will be discussed to complement the matrix analysis. Computer applications.
Prerequisites: CIVE 3310 with a minimum grade of D-

CIVE 5430 Structural Steel Design II
[3 credit hours]
Study of local failure in beams, biaxial bending, plate girders, composite beams, semi-rigid composite connections and beam columns.
Term Offered: Spring

CIVE 5440 Reinforced Concrete Design II
[3 credit hours]
Analysis and design of columns under axial compression and biaxial bending. Consideration of bar cutoff, development lengths. Design of two-way slabs and building frames in reinforced concrete. Deflection of beams. Shear design provisions for deep beams.

CIVE 5450 Bridge Design I
[3 credit hours]
Design of the three most common types of short span bridges: concrete slabs, steel stringers and prestressed concrete. Additional topics are bearings, rehabilitation and retrofit and design to minimize maintenance.
Term Offered: Spring, Summer, Fall

CIVE 5480 Reinforced Masonry Design
[3 credit hours]
Study of the design of reinforced and unreinforced masonry design, beams and walls and columns. Working stress design, strength design and empirical design are studied.
Term Offered: Spring, Fall

CIVE 5530 Microbiome and Multi-Omics
[3 credit hours]
Microbiome indicates a group of microbes, and multi-omics are biological tools to understand the role of the microbiome in nature. The course covers the basics of microbiology to the most recent microbiome research and application to various fields such as engineering, environment, and human health. Therefore, the course will be useful, especially for the students who do not have much background knowledge on microbiology but want to have a broad view of how microbes work for us. The class will provide fundamental knowledge of microbiology to the students with different training and backgrounds, such as engineering, science, pharmacy, and medicine. Hands-on experience in the lab as well as with the computers will greatly support students engage the course concepts of microbiome and multi-omics. At the end of the course, students will understand how microbes contribute to environmental sustainability, engineering processes, and human health. Must be junior or senior to enroll.
Term Offered: Spring

CIVE 5610 Hydrology And Water Resources
[3 credit hours]
This course is directed to application of fluid mechanics, hydrology, and hydraulics to the discipline of water resources engineering. Topics covered include flow in closed conduits, flow in open channels, pump systems, surface water hydrology, and computational modeling for hydraulic systems. At the successful completion of this course, the student will learn to apply the fundamental principles to the practical solution of both analysis and design problems in closed and open conduit flows.
Prerequisites: CIVE 1170 with a minimum grade of D- and CHEE 2110 with a minimum grade of D-
Term Offered: Spring, Fall

CIVE 5630 Indoor Air Quality
[3 credit hours]
Characterization of the indoor air pollutants, predictions of indoor air quality levels and indoor air quality control. Four to five design problems involving indoor air quality will be discussed/solved in the class. Special emphasis on indoor radon and asbestos problems in the United States. Use of USEPA program.
Term Offered: Fall

CIVE 5670 Solid Waste Management And Disposal
[3 credit hours]
A basic study of solid waste management concepts including origin, quantities, qualities, collection and disposal of solid waste materials. The course focuses upon municipal wastes and introduces the student to hazardous waste technologies. The primary course objective is to develop environmentally sound landfill design technologies and other ultimate disposal techniques.

CIVE 5680 Environmental Law
[3 credit hours]
An overview of the major federal environmental statutes: Clean Air Act, Clean Water Act, RCRA, CERCLA, etc. and legal perspective of why they were developed. Exposure to some basic legal principles which will be integrated into the overall study of environmental law. Provides a practical perspective on how the law can be applied to situations encountered by environmental engineers and scientists in the real world.
Term Offered: Spring, Fall

CIVE 5690 Sustainability Engineering
[3 credit hours]
Course develops students' abilities to apply the principles of sustainability to engineered sysems. Course topics include sustainability definition and data, life cycle assessment based design, planetary boundaries, greenhouse gas emissions, green construction.
Term Offered: Spring, Fall

CIVE 5710 Advanced Engineering Systems Modeling
[3 credit hours]
A systematic approach to the analysis of complicated engineering system involing uncertain and probabilistic phenomena. Decision-making with multiple objectives, monte carlo simulation, reliability based design, and Markov process are studied.
Term Offered: Spring, Fall

CIVE 5930 Graduate Seminar In Civil Engineering
[1-3 credit hours]
An opportunity for qualified graduate students to pursue a relevant area of Civil Engineering of particular personal interest under the supervision of a faculty member.
Term Offered: Spring, Fall

CIVE 6280 Environmental and Energy Geotechnology
[3 credit hours]
This course is designed for engineering and geoscience students who want to explore a broad range of engineering challenges that emerge at the interface of materials, environment and energy. This course is aimed to provide advanced students with fundamental knowledge for understanding and modelling many complex phenomena involved in a variety of engineering applications. These include technologies of nuclear and hazardous waste disposal, unconventional petroleum and gas extraction, CO2 sequestration and geothermal energy.
Term Offered: Spring

CIVE 6310 Finite Element Methods
[3 credit hours]
Study of direct stiffness method, introduction to the minimum potential energy method and the Galerkin method, formulation of truss, beam, triangular and rectangular elements, applications to the analyses of space trusses, building frames, folded plates, fluid flow and seepage problems. Applications of modern computer software.
Term Offered: Spring, Fall

CIVE 6360 Dynamics Of Structures
[3 credit hours]
Evaluation of dynamic response of structures to arbitrary time-varying loadings; single degree-of-freedom, multi-degree-of-freedom and distributed-parameter systems; partial differential equation formulations of simple systems; mode superposition and wave propagation solutions; time history analysis and estimation of maximum response by spectral analysis; effects of nonlinearities on the structural response.
Term Offered: Spring, Fall

CIVE 6460 Advanced Composite Materials In Infrastructure
[3 credit hours]
Introduction to fiber composites and their applications in repair and retrofit of infrastructure. Strengthening of bridges, buildings, pavements. Understanding of basic concepts involved in design of concrete members reinforced with fiber reinforced polymer.
Term Offered: Spring

CIVE 6480 Prestressed Concrete Structures
[3 credit hours]
Structural behavior and failure modes of prestressed concrete structures; design in prestressed concrete, including long-span structures, bridges and precast systems.
Prerequisites: CIVE 5440 with a minimum grade of D-
Term Offered: Spring, Fall

CIVE 6490 Nonlinear Modeling of Reinforced Concrete
[3 credit hours]
Theories of elasticity and plasticity as applied to reinforced concrete, mechanical properties of concrete and reinforcing bars, linear and nonlinear elastic models, shear response, compression field and smeared crack models, their implementation and application into nonlinear finite element analysis, and performance assessment of plane frame structures.
Prerequisites: CIVE 3420 with a minimum grade of C and CIVE 6310 with a minimum grade of C or CIVE 8310 with a minimum grade of C or MIME 4280 with a minimum grade of C or MIME 5280 with a minimum grade of C

CIVE 6670 Physicochemical Processes for Water Quality Control
[3 credit hours]
The course will discuss theories and designs for water treatment processes.
Term Offered: Spring, Fall

CIVE 6900 Civil Engineering Problems
[3 credit hours]
Special assignment of civil engineering problems of various types at the graduate level.
Term Offered: Spring, Summer, Fall

CIVE 6920 Civil Engineering Project
[1-6 credit hours]
The student performs a special project of an advanced nature in civil engineering. The course is primarily intended for students pursuing a Masters degree with the project option in Civil Engineering.
Term Offered: Spring, Summer, Fall

CIVE 6960 Graduate Research And Thesis - Masters
[1-9 credit hours]
MS student should register their adviser's section number.
Term Offered: Spring, Summer, Fall

CIVE 6970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Master's/doctoral degree program.
Term Offered: Spring, Summer, Fall

CIVE 6980 Special Topics in Civil and Environmental Engineering
[1-6 credit hours]
This course is offered on selected subjects in a field in civil or environmental engineering with intensive investigation of the recent literature in an area of special interest to the class and the instructor.
Term Offered: Spring, Summer, Fall

CIVE 6990 Independent Study in Civil and Environmental Engineering
[1-6 credit hours]
The student, under the guidance of their research advisor, explores in-depth specific areas or topics related to their project, thesis, or dissertation research, or other academic interests.
Term Offered: Spring, Summer, Fall

CIVE 7430 Structural Steel Design II
[3 credit hours]

CIVE 7450 Bridge Design I
[3 credit hours]
Design of the three most common types of short span bridges: concrete slabs, steel stringers and prestressed concrete. Additional topics are bearings, rehabilitation and retrofit and design to minimize maintenance.
Term Offered: Spring, Fall

CIVE 7900 Independent Problems
[1-6 credit hours]

CIVE 8280 Environmental and Energy Geotechnology
[3 credit hours]
This course is designed for engineering and geoscience students who want to explore a broad range of engineering challenges that emerge at the interface of materials, environment and energy. This course is aimed to provide advanced students with fundamental knowledge for understanding and modelling many complex phenomena involved in a variety of engineering applications. These include technologies of nuclear and hazardous waste disposal, unconventional petroleum and gas extraction, CO2 sequestration and geothermal energy.
Term Offered: Spring

CIVE 8310 Finite Element Methods
[3 credit hours]
Study of direct stiffness method, introduction to the minimum potential energy method and the Galerkin method, formulation of truss, beam, triangular and rectangular elements, applications to the analyses of space trusses, building frames, folded plates, fluid flow and seepage problems. Applications of modern computer software.
Term Offered: Spring, Fall

CIVE 8360 Dynamics Of Structures
[3 credit hours]
Evaluation of dynamic response of structures to arbitrary time-varying loadings; single degree-of-freedom, multi-degree-of-freedom and distributed-parameter systems; partial differential equation formulations of simple systems; mode superposition and wave propagation solutions; time history analysis and estimation of maximum response by spectral analysis; effects of nonlinearities on the structural response.
Term Offered: Spring, Fall

CIVE 8460 Advanced Composite Materials In Infrastructure
[3 credit hours]
Introduction to fiber composites and their applications in repair and retrofit of infrastructure. Strengthening of bridges, buildings, pavements. Understanding of basic concepts involved in design of concrete members reinforced with fiber reinforced polymer.
Term Offered: Spring

CIVE 8490 Nonlinear Modeling of Reinforced Concrete
[3 credit hours]
Theories of elasticity and plasticity as applied to reinforced concrete, mechanical properties of concrete and reinforcing bars, linear and nonlinear elastic models, shear response, compression field and smeared crack models, their implementation and application into nonlinear finite element analysis, and performance assessment of plane frame structures.
Prerequisites: CIVE 3420 with a minimum grade of C and CIVE 6310 with a minimum grade of C or CIVE 8310 with a minimum grade of C or MIME 4280 with a minimum grade of C or MIME 5280 with a minimum grade of C

CIVE 8670 Physicochemical Processes for Water Quality Control
[3 credit hours]
The course will discuss theories and designs for water treatment processes.
Term Offered: Spring, Fall

CIVE 8900 Independent Problems
[1-6 credit hours]
Ph.D. student should register their adviser's section number.
Term Offered: Spring, Summer, Fall

CIVE 8960 Doctoral Graduate Research & Dissertation
[1-16 credit hours]
Graduate research towards the completion of a Doctoral degree.
Term Offered: Spring, Summer, Fall

CIVE 8970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Master's/doctoral degree program.
Term Offered: Spring, Summer, Fall

CIVE 8980 Special Topics in Civil and Environmental Engineering
[1-6 credit hours]
This course is offered on selected subjects in a field in civil or environmental engineering with intensive investigation of the recent literature in an area of special interest to the class and the instructor.
Term Offered: Spring, Summer, Fall

CIVE 8990 Independent Study in Civil and Environmental Engineering
[1-6 credit hours]
The student, under the guidance of their research advisor, explores in-depth specific areas or topics related to their project, thesis, or dissertation research, or other academic interests.
Term Offered: Spring, Summer, Fall

M.S. in Civil Engineering (Civil and Environmental Engineering)

OVERVIEW

M.S. students in our department gain advanced knowledge in environmental, geotechnical, structural, or transportation engineering. Students pursuing a research-based M.S. are expected to not only gain but also develop and share advanced knowledge to solve today's challenging problems including, but not limited to, harmful algal blooms (HABs), artificial intelligence in transportation, and infection disease tracking through analysis of wastewater. The department faculty conduct both applied and fundamental research and tailor the research to students' interests and skill sets. Students are expected to present their work in local and national conferences. Our department has an excellent track record with our M.S. students finding employment in industry or consulting firms prior to or shortly after graduation. M.S. students interested in an academic career often publish their research before continuing on to obtain a Ph.D. degree either in our department or at another institution.

ADMISSIONS REQUIREMENTS

Background of students: Admission for graduate students at The University of Toledo requires a four-year bachelor's degree from an accredited college of university. Most students admitted have a strong GPA from a civil, environmental, or chemical engineering department and have a GRE quantitative score of 160. Students with non-engineering backgrounds can be admitted or provisionally admitted on a case-by-case basis after review of the applicant's transcripts and prior accomplishments. If provisionally admitted, students will need to take certain undergraduate courses to prepare for graduate courses. These courses will be identified prior to admission and will appear on the student's plan of study.

Test scores: For all applicants from an accredited U.S. or Canadian university with an undergraduate GPA below 2.7 and for all international applicants from non-English speaking countries, GRE scores must be submitted with a quantitative GRE score of at least 150. For all international applicants from non-English speaking countries, an English test score is required. Minimum test scores should be TOEFL speaking score of 22 (total 81), IETLS Band 6.5 or Duolingo (105). Students not meeting these scores could be provisionally admitted by completing the GAP (https://www.utoledo.edu/cisp/gap.html) option.

Recommendation letters: The Department of Civil and Environmental Engineering requires two letters of recommendation. The letters can be from professors, employers or workplace supervisors. Unless it has been a long time since the applicant were a student, at least one letter should be from a professor.

Statement of purpose: The applicant should indicate their area of interest (environmental, geotechnical, structural, or transportation) in the statement of purpose.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Required for applicants whose degree is from a non-US institution.

- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 2
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** January 15
- **Spring:** October 1
- **Summer:** Contact program

Review of the application: Once the application is deemed complete by the College of Graduate Studies, the application is made available to the Civil and Environmental Engineering Department. The admissions committee of the department considers the application as a whole, including statements of purpose and reference letters. While exceptions for some circumstances have been made, the minimum expected GPA of admitted applicants is the equivalent of 70%.

PROGRAM REQUIREMENTS

For the master of science in civil engineering (M.S.C.E.) degree, a minimum of 30 credit hours is required – 21 cr hr of graduate course work and 9 cr hr of thesis research (CIVE 6960) performed under the supervision of a full-time faculty member approved by the department of civil engineering. The department also offers a M.S.C.E. degree with a project or course work option with the written approval of the department chair or graduate program director. In the project option, a minimum of 30 cr hr is required – 24 cr hr of graduate course work and 6 cr hr for the project report (CIVE 6920). In the course work-only option, a minimum of 30 cr hr in graduate course work is required. Courses taken on an audit basis do not count toward the degree. Additional requirements include:

- A maximum of 6 cr hr of CIVE 6990 Independent Study is allowed toward the degree.
- Students must prepare a plan of study in conjunction with the adviser (graduate program director for the first semester) with a concentration of required and elective courses in one of the department's research focus areas of graduate study and receive approval from the graduate program director. Required core courses in each area are determined by the faculty comprising that research area in conjunction with the graduate program director.
- No more than 9 cr hr toward the M.S.C.E. may be earned at another university, and in no case may the thesis or project be satisfied by work completed at another institution.

Combined bachelor's to master's - Civil Engineering

Undergraduate students accepted to the **BS/MS pipeline program** option will be admitted to the **MS program of Civil Engineering** and allowed to complete up to three graduate level classes (nine credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in to the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) CIVE 5300, CIVE 5320, CIVE 5340, CIVE 5440, CIVE 5480, CIVE 5610, CIVE 5710 and other elective coursework as approved by the Undergraduate and Graduate Program Directors may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

- PLO 1. Solve engineering problems in one of the two specialty areas (Infrastructure and Environmental).
- PLO 2. Solve engineering problems using mathematics in one of the two specialty areas indicated in SLO (1).
- PLO 3. Successfully present the results of engineering research in oral and written forms.
- PLO 4. Synthesize the completed research for publication in a journal, book, or conference for thesis students.
- PLO 5. Practice responsible citizenship in local and global communities by using skills including but not limited to professional ethics, diversity and inclusion, and social equity.

Ph.D. in Engineering (Civil and Environmental Engineering)

OVERVIEW

Our PhD program is geared towards students interested in an academic path or an advanced research based career. Most of our PhD students joining the program hold an MS degree and they are able to finish their program within three to four years. Many of our PhD students have published their research in peer reviewed journals and some have also obtained teaching skills to prepare them better for an academic position.

ADMISSIONS REQUIREMENTS

Background of students: Most students have a prior MS degree in engineering. Students applying for a PhD degree without an MS degree are typically admitted to the MS program and may later switch to the PhD program upon their interest and high level performance and approval of their advisor. Most students admitted have a strong GPA from a civil, environmental, or chemical engineering department and have a GRE quantitative score of 160. Students with non-engineering backgrounds can be admitted on a case-by-case basis after review of the applicants' transcripts and prior accomplishments.

Test scores: For all applicants from an accredited U.S. or Canadian university with an undergraduate GPA below 2.7 and for all international applicants from non-English speaking countries, GRE scores must be submitted with a quantitative GRE score of at least 150. For all international applicants from non-English speaking countries, an English test score is required. Minimum test scores should be TOEFL speaking score of 22 (total 81), IETLS Band 6.5 or Duolingo (105). Students not meeting these scores could be provisionally admitted by completing the GAP (https://www.utoledo.edu/cisp/gap.html) option.

Recommendation letters: The Department of Civil and Environmental Engineering requires two letters of recommendation but more will strengthen the application. The letters can be from professors, employers or workplace supervisors. Unless it has been a long time since the applicant was a student, at least one letter should be from a professor.

Statements of purpose: The applicant should indicate their area of interest (environmental, geotechnical, structural, or transportation) in the statement of purpose.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Required for applicants whose degree is from a non-US institution.
- **Transcripts:** Required
- **Statement of Purpose:** Required (indicate area of interest: geotechnical, transportation, environmental, or structural engineering)
- **Letters of Recommendation:** 2
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** January 15
- **Spring:** October 1
- **Summer:** Contact program

Review of the application: Once the application is deemed complete by the College of Graduate Studies, the application is made available to the Civil and Environmental Engineering Department. The admissions committee of the department considers the application as a whole, including statements of purpose and reference letters.

PROGRAM REQUIREMENTS

The doctoral degree requires a minimum of 90 credit hours, of which 45 credit hours are for course work and 45 credit hours are for dissertation research. To be formally admitted to candidacy for the degree, however, doctoral students must first pass a qualifying examination. All Ph.D. students should note that admission to the doctoral program does not constitute admission to candidacy. The doctoral program is normally a full-time program throughout all of the course work and the dissertation. The department of civil engineering does not encourage part-time studies in the Ph.D. program.

For the Ph.D. degree, a minimum of 60 graduate credit hours beyond the M.S.C.E. degree (90 credit hours beyond the B.S. degree) are required, of which at least 12 credit hours are for graduate course work (largely departmental), an additional three credit hours for graduate level mathematics course work, and 45 credit hours for dissertation research under the supervision of a full-time faculty member of the department of civil engineering. A minimum of 45 credit hours beyond the M.S. must be completed at The University of Toledo.

To be awarded the Ph.D. degree, the student must have at least a B average (minimum GPA of 3.0) for all credits in the program of study. Only credit hours obtained with a letter grade of "C" or higher, or an "S" grade for the limited number of classes offered on a satisfactory or unsatisfactory basis, will fulfill degree requirements. In addition, the student must be admitted to doctoral candidacy and pursue an original research problem. The research must be completed and the dissertation written and successfully defended in public before the Ph.D. degree is conferred.

Department of Electrical Engineering and Computer Science

Liang Cheng, chair
Daniel Georgiev, graduate program director

The mission of the Electrical Engineering and Computer Science (EECS) department is to educate future engineers and scientists in the fields of electrical engineering and computer science; to contribute to the body of knowledge in the fields of electrical engineering and computer science; and to conduct research and contribute to the development of innovative solutions to address diverse technological and societal needs.

The EECS department offers advanced studies leading to the M.S. or the Ph.D. degrees as well as a Graduate Certificate in Cybersecurity. EECS Graduate courses and research entail diverse topics across the spectrum of electrical engineering (EE) and computer science and engineering (CSE).

- In the EE research track, current topics include communications, control and signal processing, machine vision and imaging, power systems, power electronics, nano-electronic materials and devices, photovoltaic devices, laser-based advanced processing, electromagnetics and plasma science, renewable energy and smart grid, and microelectronics.
- In the CSE research track, current topics in computer science and engineering include artificial intelligence, computer systems design and applications (hardware and software), computer graphics and

visualization, computer aided design and simulation, cyber and computer security, hardware-oriented security and trust, social networking, and high-performance computing.

Degrees Offered

- Graduate Certificate in Cyber Security (p. 40)
- M.S. in Cyber Security (p. 40)
- M.S. in Electrical Engineering (p. 43)
- M.S. in Engineering (Computer Science & Engineering) (p. 45)
- Ph.D. in Engineering (Computer Science & Engineering) (p. 47)
- Ph.D. in Engineering (Electrical Engineering) (p. 48)

COURSES

CYBR 5930 Cyber Security Seminar
[0 credit hours]
All graduate students in the Master of Science in Cyber Security program are expected to attend the seminar each semester and to keep a journal of ideas, questions, and other items that may benefit their research. Students will also present their thesis and project results in the seminar.
Term Offered: Spring, Fall

CYBR 6800 Experiential Learning in Cyber Security
[3 credit hours]
This course will discuss advanced topics in computer and network security. It will revisit the foundation of cyber security, and then discuss recent attacks, analyze attack trends, and on-going activities in a number of emerging areas in cyber security. Students will also have the opportunities to learn real-world attacks and defenses through the UT Cyber Range infrastructure with the guidance from IT security team at UT.
Prerequisites: EECS 5640 with a minimum grade of D- and EECS 5720 with a minimum grade of D- and EECS 5790 with a minimum grade of D-
Term Offered: Fall

CYBR 6920 Cyber Security Project
[1-6 credit hours]
Intensive discipline specific study in cyber security for the project option, may include theoretical and experimental work. This course may be repeated for credit for up to 6 credit hours. The exact topic will be agreed upon mutually after discussion between the instructor and the student.
Term Offered: Spring, Summer, Fall

CYBR 6960 Cyber Security Research and Thesis
[1-9 credit hours]
Intensive discipline specific study in cyber security, including theoretical and experimental work. This course may be repeated for credit with minimum 9 cr hr required for the MS thesis. The exact topic will be agreed upon mutually after discussion between the instructor and the student.
Term Offered: Spring, Summer, Fall

CYBR 6970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Master's degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

CYBR 6990 Independent Study in Cyber Security
[1-3 credit hours]
Intensive discipline specific study in cyber security up to 3 hours, may include theoretical and experimental work. This course may be repeated for credit. The exact topic will be agreed upon mutually after discussion between the instructor and the student.
Term Offered: Spring, Summer, Fall

EECS 5120 Introduction to Fuzzy Systems and Applications
[3 credit hours]
Introduction to Fuzzy Rule Based Intelligent Systems. Basic concepts of Fuzzy logic, Fuzzy Sets, Fuzzy Arithmetic, Fuzzy Relations, Fuzzy Graphs, Approximate Reasoning and Fuzzy Implication. Applications in Real World Domains.
Term Offered: Spring, Fall

EECS 5200 Feedback Control Systems
[3 credit hours]
Feedback methods for the control of dynamic systems. Topics include characteristics and performance of feedback systems, state variable analysis stability, root locus and frequency response methods and computer simulations.
Term Offered: Spring

EECS 5220 Programmable Logic Controllers
[3 credit hours]
Programmable Logic Controllers (PLCs), programming, sensors, process control algorithms, interfacing of sensors and other I/O devices, simulation and networking.
Term Offered: Spring, Fall

EECS 5240 Power Systems Operation
[3 credit hours]
Single Line Diagrams & Per Unit calculations, Network Matrices & Ybus for systems with uncoupled lines, Load Flow Techniques, Large system Loss Formula using Zbus, Real and Reactive Power Dispatch programming, Power systems relays & protection schemes.
Term Offered: Spring, Fall

EECS 5260 Control Systems Design
[3 credit hours]
A general study of computer-aided design of control systems. Topics include: stability, compensation, pole placement, nonlinear systems and digital systems.
Term Offered: Fall

EECS 5330 Image Analysis And Computer Vision
[3 credit hours]
Imaging geometry, image filtering, segmentation techniques, image representation and description, stereovision and depth measurements, texture analysis, dynamic vision and motion analysis, matching and recognition.
Term Offered: Spring, Fall

EECS 5360 Communication Systems
[3 credit hours]
Fourier transform applications in signal analysis and communication. Signals spectra, filtering, AM and FM modulation, noise and optimum receiver, sampling theorem, multiplexing, PCM, introduction to digital modulators and demodulators.
Prerequisites: EECS 3300 with a minimum grade of D-
Term Offered: Spring, Fall

EECS 5370 Information Theory And Coding
[3 credit hours]
Coding concepts, Huffman code, Entropy analysis, Channel and mutual information, Channel capacity and Shannon's theorems, Algebraic coding theory and application to block code and cyclic code, Introduction to convolutional code.
Term Offered: Spring, Fall

EECS 5380 Digital Signal Processing
[3 credit hours]
Discrete Fourier Transform (DFT), discrete convolution and correlation, Fast Fourier Transform (FFT) and its applications, design of IIR and FIR digital filters, multirate/channel digital systems, decimation and interpolation.
Prerequisites: EECS 3210 with a minimum grade of D-
Term Offered: Spring, Fall

EECS 5390 Wireless And Mobile Networks
[3 credit hours]
Mobile radio propagation; traffic engineering; cellular concept; multiple radio access; multiple division techniques; channel allocation; mobile communication systems; existing wireless systems; network protocols; Ad Hoc and sensor networks; wireless LANS and PANS; recent advances.
Term Offered: Spring, Fall

EECS 5410 Electro-Optics
[3 credit hours]
Laser physics, optics, optical waveguides, optical communication systems and electro-optics. Design of light processing and communication systems will be considered with emphasis on optics and optical communication.
Term Offered: Spring, Fall

EECS 5460 Power Systems Management
[3 credit hours]
An advanced study of the management and operation of today's power system. Included are historical developments, utility and operational costs and economics, power generation alternatives, fuel alternatives, renewable applications, transmission and distribution practices, and a discussion of current power system issues, both in the U.S. and abroad.
Prerequisites: EECS 3220 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

EECS 5480 Power Electronics 1
[3 credit hours]
Basic electronic power switching circuits. Half-wave and full-wave rectification. Characteristics of power semiconductors. Phase-controlled rectifiers and inverters. Isolated and non-isolated dc-dc converters.
Term Offered: Spring, Fall

EECS 5500 Programming for the World Wide Web
[3 credit hours]
Fundamental concepts and programming languages for constructing contempoary websites. Differences and similarities between procedural, object-oriented, and scripting languages. Topics include HTML, Javascript, CSS, XML, Ajax, PHP, ASP.net, Three.js, and related technologies, as well as their impact on the programming process.
Term Offered: Spring

EECS 5520 Advanced Systems Programming
[3 credit hours]
This course examines pertinent concepts of systems programming. Topics covered include: synchronization, distributed programming models, kernel design, peripheral handling, file systems and security history and methods.
Prerequisites: EECS 3540 with a minimum grade of D-
Term Offered: Spring

EECS 5530 Computer Graphics I
[3 credit hours]
An introduction to typical computer graphics systems and their operation. Interactive techniques will be introduced as well as representations and projections of three-dimensional images. Exercises using graphics equipment are assigned.
Prerequisites: EECS 2510 with a minimum grade of D-
Term Offered: Spring, Fall

EECS 5560 Database Systems I
[3 credit hours]
The following topics are covered: relational database modeling, query languages, design issues and implementation issued of databases. An appropriate database language is introduced and used to demonstrate principles.
Term Offered: Spring, Fall

EECS 5590 Algorithms
[3 credit hours]
Techniques for devising efficient computer algorithms. Topics include: divide-and-conquer techniques, dynamic programming, linear programming, graph algorithms, greedy algorithms, NP and P complexity classes, and approximation algorithms for NP complete problems.
Prerequisites: EECS 2510 with a minimum grade of C- and EECS 4100 with a minimum grade of C-
Term Offered: Spring, Fall

EECS 5600 Solid State Devices
[3 credit hours]
Theory and operation of physical electronic devices. Electrical transport in metals, semiconductors and models of BJT's and FET's. Optoelectronic devices and integrated circuits. Laboratory includes hands-on experimentation with basic semiconductor fabrication processes.
Term Offered: Spring

EECS 5610 Digital VLSI Design I: Basic Subsystems
[3 credit hours]
CMOS process technologies, CMOS logic families, custom and semi-custom design. Subsystem design of adders, counters and multipliers. System design methods and VLSI design tools.
Prerequisites: EECS 3400 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

EECS 5640 Inside Cryptography
[3 credit hours]
Examines the inner workings of several cryptographic algorithms, including the discrete math behind them. Introduces operations in a Galois Field, and covers some Prime Number Theory. Symmetric algorithms include Feistel (DES) and non-Feistel (AES) designs; Asymmetric algorithms include Merkle-Hellman and RSA. Block and stream modes are explored, as are cryptographic hash functions, and ECB and Chained modes of encryption.
Prerequisites: EECS 2520 with a minimum grade of D- and EECS 3100 with a minimum grade of D-
Term Offered: Spring, Fall

EECS 5720 Fundamentals of Cyber Security
[3 credit hours]
This course introduces cybersecurity concepts and their relevance to national security, businesses, society, and individuals. Concepts that will be discussed include terminologies, blockchain, cryptocurrency, maths/statistics in the domain, review of various cybersecurity domains, forensics, and methods/practices to secure systems. Additional real-world security problems will be introduced through hands-on experiments.
Prerequisites: EECS 2110 with a minimum grade of D- or CSET 2200 with a minimum grade of D-
Term Offered: Spring, Fall

EECS 5740 Artificial Intelligence
[3 credit hours]
This course explores the topic of intelligent software agents with a emphasis on hands-on design of adaptive problem-solving agents for environments of increasing complexity ranging from single-agent computer games to complex real-world mult-agent environments.
Term Offered: Spring

EECS 5750 Machine Learning
[3 credit hours]
This course covers machine learning algorithms, theory and applications for decision tree, neural network, computational, Bayesian, evolutionary, and reinforcement learning.
Prerequisites: (MATH 1890 with a minimum grade of D- or MATH 2890 with a minimum grade of D-) and (MIME 4000 with a minimum grade of D- or EECS 3300 with a minimum grade of D- or MATH 4680 with a minimum grade of D- or MATH 2600 with a minimum grade of D-) and (EECS 1030 with a minimum grade of D- or CSET 1100 with a minimum grade of D-)
Term Offered: Spring, Fall

EECS 5760 Computer Security
[3 credit hours]
Survey of computer security concepts: ethics and responsibility, OS vulnerabilities and intrusion detection, viruses and worms, defensive strategies including secret/public key cryptosystems, firewalls and decoys.
Prerequisites: EECS 2110 with a minimum grade of C- and EECS 3540 with a minimum grade of C-
Term Offered: Fall

EECS 5770 Computer Hacking and Forensic Analysis
[3 credit hours]
This course is an introduction to discovering vulnerabilities, attacking/defending systems, responding to attacks, and identifying/designing controls for attack prevention. Topics include the evolution of hacking, penetration testing; cryptology; footprinting; vulnerability scanning and exploit; wireless, web, and database attacks; traffic analysis; incident response; and defensive technologies and controls.
Prerequisites: (EECS 2110 with a minimum grade of C- and EECS 4720 with a minimum grade of C-) or (EECS 5720 with a minimum grade of C)
Term Offered: Spring, Fall

EECS 5790 Network Security
[4 credit hours]
Theory and practice of network security. Topics include firewalls, Windows, UNIX and TCP/IP network security. Security auditing, attacks, viruses, intrusion detection and threat analysis will also be covered.
Prerequisites: EECS 4720 with a minimum grade of D- or EECS 5720 with a minimum grade of C
Term Offered: Spring

EECS 5830 Artificial Neural Networks and Deep Learning
[3 credit hours]
This course deals with various neural network architectures and learning algorithms for the training networks. Topics include perceptron, basic learning algorithms, the delta learning rule, multilayer feed forward NNs, backpropagation and gradient decent algorithm, cost functions, overfitting, regularization, and convolutional networks.
Term Offered: Spring, Fall

EECS 5920 Projects
[1-6 credit hours]
Independent research project with intensive investigation into an area of practical interest to the student and the instructor. Students will make progress in a project of an advanced nature in Electrical Engineering/Computer Science and Engineering. The project will culminate in a submission of a written report. Course may be repeated.
Term Offered: Spring, Summer, Fall

EECS 5930 Electrical Engineering & Computer Science Seminar
[1 credit hour]
Seminar talk series by invited speakers from academia, industry, research corporations, private or federal research labs, and funding agencies. 1 cr. hr. seminar.
Term Offered: Spring, Fall

EECS 5980 Special Topics in EECS
[1-4 credit hours]
Pilot offerings of new courses involving emerging topics of interest are introduced using this number. One credit per lecture hour or 2.5 lab hours per week.
Term Offered: Spring, Fall

EECS 6110 Advanced Computer Architecture
[3 credit hours]
Foundational principles involved in the design of modern computer systems. Topics include Instruction Set Architecture (ISA), CPU design, memory hierarchy, RISC/MIPS/CISC architectures, pipelining, ALU design, and input/output (I/O) systems. Cost performance analysis in computer architecture design, multicore, multiprocessor, and cluster architecture. Emerging trends and topics in computer architecture design.
Term Offered: Spring, Fall

EECS 6180 Biologically Inspired Computing
[3 credit hours]
Introduction to Computational Techniques inspired from Biology for Self Learning Adaptive Systems. Evolutionary Computations, Binary and Real coded Genetic Algorithms. Neural Networks, Swarm Intelligence, DNA Computing and Artificial Immune Systems. Hybrid systems such as Evolutionary Fuzzy Systems and Evolutionary Neural Systems, Swarm Neural Systems. Emerging Topics in Computing inspired by nature.
Term Offered: Fall

EECS 6190 Renewable Energy and Smart Grid
[3 credit hours]
Electric power systems nowadays are undergoing significant changes worldwide in order to become cleaner, smarter, and more reliable. This course examines a broad spectrum of topics relevant to theses changes.
Term Offered: Fall

EECS 6230 Optimal Control Theory
[3 credit hours]
Optimization of dynamic systems by the calculus of variations and Pontryagin's Maximum Principle. Solution of optimal control problems using direct and indirect computational methods. Applications include constrained state and/or control parameters.
Prerequisites: EECS 4200 with a minimum grade of D-

EECS 6300 Random Signals And Optimal Filters
[3 credit hours]
Description and properties of random signals and their processing by optimal filters. Correlation and power spectra. GRP. Narrowband noise. Signal detection (matched filter) and estimation (Wiener and Kalman filters).
Term Offered: Fall

EECS 6320 Data Compression For Multimedia Communication
[3 credit hours]
Multimedia information representation, Huffman, run length and arithmetic coding, predictive, transform, pyramid coding; vector quantization and subband coding; wavelet-based coding, data packetization, error resilience coding, mutimedia compression standards, JPEG, MPEG coding.
Term Offered: Spring

EECS 6340 Modern Communications Engineering I
[3 credit hours]
Introduction to detection and estimation and applications to the bandpass signals, Bibary and M-ary digital modulation techniques, Error-control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques.
Term Offered: Spring, Fall

EECS 6350 Modern Communications Engineering II
[3 credit hours]
Digital transmission over Gaussian/non-Faussian channels, Satellite systems (GEO and LEO) and multiple accesses, Cellular and satellite communication network, Mobile/wireless Personal communication services (PCS) and its networking.
Term Offered: Spring, Fall

EECS 6450 Advanced Power Electronics
[3 credit hours]
Dynamic analysis of DC-DC power conversion circuits. State space and converter transfer functions. Analytical semiconductor device modeling techniques. Sinusoidal pulse width modulation in inverter circuits. Isolated DC-DC converters.
Prerequisites: EECS 5480 with a minimum grade of D-
Term Offered: Spring

EECS 6550 Software Specification And Design
[3 credit hours]
This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.
Term Offered: Spring, Fall

EECS 6570 Intelligent Systems
[3 credit hours]
Heuristic search, game playing, constraint satisfaction, knowledge representation and reasoning with first order logic, planning, probabilistic modeling and reasoning, and learning.
Term Offered: Fall

EECS 6580 Wireless Sensor Networks
[3 credit hours]
Single node and network architecture, design principles, medium access control, naming and addressing, synchronization, localization and positioning, topology control, routing protocols, data-centric networking, and information and data aggregation.
Term Offered: Spring

EECS 6610 Principles of CMOS Devices
[3 credit hours]
MOSFET Device Physics, CMOS Fabrication, Scaling Trends, Characterization, Technology CAD, Digital Analog and RF Applications, Advanced Device Concepts, Nanoelectronics.
Term Offered: Spring

EECS 6630 Digital and VLSI System Testing
[3 credit hours]
In depth study of testing techniques for digital and VLSI circuit including memory and logic, field programmable gate arrays, system on chips, and quantum dot cellular automata circuits.
Term Offered: Spring

EECS 6650 Hardware Oriented Security and Trust
[3 credit hours]
The course covers the following topics: Hardware Security Basics, Physical Unclonable Function (PUF), Metrics for Evaluating PUFs, Split Manufacturing, Hardware Trojans, Detection of Hardware Trojans, Built-In Self-Repair Hardware Circuits, Security of FPGAs, Machine Learning Attack Models, Testing of Digital/VLSI Circuits.
Term Offered: Spring, Fall

EECS 6660 Field Programmable Gate Arrays
[3 credit hours]
Introduction to FPGA's. Programming technology. Logic block architectures. Routing architectures. FPGA based VLSI design. Design tools.
Term Offered: Spring, Fall

EECS 6830 Power Semiconductor Device Engineering
[3 credit hours]
Semiconductor material physics, electrical transport physics, power switching, power amplification characteristics, power diodes, power MOSFETs, power MOS-bipolar devices, thyristors, and emerging devices.
Term Offered: Fall

EECS 6840 Compound Semiconductors and Devices
[3 credit hours]
This course will cover the fundamentals of various compound-semiconductor materials and devices, including materials and device physics, diodes, GaAs MESFETS, optoelectronic and photovoltaic devices and structures.
Term Offered: Fall

EECS 6860 RF Integrated Circuits
[3 credit hours]
Wireless principles, Passive RLC networks, Passive IC component characteristics, MOS Device Physics, Distributed Systems, Smith Chart and s-parameters, Bandwidth estimation, high frequency amplifier design, voltage references, noise, LNA design, mixers, feedback systems, RF power amplifiers, PLLs, Oscillators and Synthesizers, Phase Noise, Transceiver architectures.
Term Offered: Spring

EECS 6870 Advanced Analog Integrated Circuits
[3 credit hours]
Integrated Circuit Technology, Device Modeling, MOS Switches, Current Sinks and Sources, Bandgap References, Amplifiers, Operational Amplifiers, Comparators, Switched-Capacitor Circuits, Data Converters
Term Offered: Fall

EECS 6900 Independent Research
[1-6 credit hours]
Selected topics from current EE and CSE research with intensive investigation into recent literature in an area of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

EECS 6910 EECS Graduate Seminar
[1 credit hour]
Students will attend seminars and prepare a report reflecting their learning, questions and the impact of the seminar series. Students will also present their thesis or project plan and initial research results.
Term Offered: Spring, Fall

EECS 6960 Master's Graduate Research And Thesis
[1-9 credit hours]
Graduate research towards the completion of a Master's degree. Students will make progress in a project of an advanced nature in Electrical Engineering/Computer Science and Engineering. The project will culminate in submission and a public defense a master's thesis. Course may be repeated.
Term Offered: Spring, Summer, Fall

EECS 6970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency full-time internship to provide an experiential learning component to the Master's/Doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

EECS 6980 Special Topics In Electrical Engineering & Computer Science
[1-5 credit hours]
Selected topics in the field of Electrical Engineering and Computer Science in areas of special interest to the class and the professor.
Term Offered: Spring, Summer, Fall

EECS 6990 Independent Study
[1-3 credit hours]
In depth study of a selected topic of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

EECS 8110 Advanced Computer Architecture
[3 credit hours]
Foundational principles involved in the design of modern computer systems. Topics include Instruction Set Architecture (ISA), CPU design, memory hierarchy, RISC/MIPS/CISC architectures, pipelining, ALU design, and input/output (I/O) systems. Cost performance analysis in computer architecture design, multicore, multiprocessor, and cluster architecture. Emerging trends and topics in computer architecture design.
Term Offered: Spring, Fall

EECS 8180 Biologically Inspired Computing
[3 credit hours]
Introduction to Computational Techniques inspired from Biology for Self Learning Adaptive Systems. Evolutionary Computations, Binary and Real coded Genetic Algorithms. Neural Networks, Swarm Intelligence, DNA Computing and Artificial Immune Systems. Hybrid systems such as Evolutionary Fuzzy Systems and Evolutionary Neural Systems, Swarm Neural Systems. Emerging Topics in Computing inspired by nature.
Term Offered: Fall

EECS 8190 Renewable Energy and Smart Grid
[3 credit hours]
Electric power systems nowadays are undergoing significant changes worldwide in order to become cleaner, smarter, and more reliable. This course examines a broad spectrum of topics relevant to theses changes.
Term Offered: Fall

EECS 8230 Optimal Control Theory
[3 credit hours]
Optimization of dynamic systems by the calculus of variations and Pontryagin's Maximum Principle. Solution of optimal control problems using direct and indirect computational methods. Applications include constrained state and/or control parameters.
Prerequisites: EECS 4200 with a minimum grade of D-

EECS 8300 Random Signals And Optimal Filters
[3 credit hours]
Description and properties of random signals and their processing by optimal filters. Correlation and power spectra. GRP. Narrowband noise. Signal detection (matched filter) and estimation (Wiener and Kalman filters).
Term Offered: Fall

EECS 8320 Data Compression For Multimedia Communication
[3 credit hours]
Multimedia information representation, Huffman, run length and arithmetic coding, predictive, transform, pyramid coding; vector quantization and subband coding; wavelet-based coding, data packetization, error resilience coding, mutimedia compression standards, JPEG, MPEG coding.
Term Offered: Spring

EECS 8340 Modern Communications Engineering I
[3 credit hours]
Introduction to detection and estimation and applications to the bandpass signals, Bibary and M-ary digital modulation techniques, Error-control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques.
Term Offered: Spring, Fall

EECS 8350 Modern Communications Engineering II
[3 credit hours]
Digital transmission over Gaussian/non-Faussian channels, Satellite systems (GEO and LEO) and multiple accesses, Cellular and satellite communication network, Mobile/wireless Personal communication services (PCS) and its networking.
Term Offered: Spring, Fall

EECS 8450 Advanced Power Electronics
[3 credit hours]
Dynamic analysis of DC-DC power conversion circuits. State space and converter transfer functions. Analytical semiconductor device modeling techniques. Sinusoidal pulse width modulation in inverter circuits. Isolated DC-DC converters.
Prerequisites: EECS 5480 with a minimum grade of D-
Term Offered: Spring

EECS 8550 Software Specification And Design
[3 credit hours]
This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.
Term Offered: Spring, Fall

EECS 8570 Intelligent Systems
[3 credit hours]
Heuristic search, game playing, constraint satisfaction, knowledge representation and reasoning with first order logic, planning, probabilistic modeling and reasoning, and learning.
Term Offered: Fall

EECS 8580 Wireless Sensor Networks
[3 credit hours]
Single node and network architecture, design principles, medium access control, naming and addressing, synchronization, localization and positioning, topology control, routing protocols, data-centric networking, and information and data aggregation.
Term Offered: Spring

EECS 8610 Principles of CMOS Devices
[3 credit hours]
MOSFET Device Physics, CMOS Fabrication, Scaling Trends, Characterization, Technology CAD, Digital Analog and RF Applications, Advanced Device Concepts, Nanoelectronics.
Term Offered: Spring

EECS 8630 Digital and VLSI System Testing
[3 credit hours]
In depth study of testing techniques for digital and VLSI circuit including memory and logic, field programmable gate arrays, system on chips, and quantum dot cellular automata circuits
Term Offered: Spring

EECS 8660 Field Programmable Gate Arrays
[3 credit hours]
Introduction to FPGA's. Programming technology. Logic block architectures. Routing architectures. FPGA based VLSI design. Design tools.
Term Offered: Spring, Fall

EECS 8670 Hardware Oriented Security and Trust
[3 credit hours]
The course covers the following topics: Hardware Security Basics, Physical Unclonable Function (PUF), Metrics for Evaluating PUFs, Split Manufacturing, Hardware Trojans, Detection of Hardware Trojans, Built-In Self-Repair Hardware Circuits, Security of FPGAs, Machine Learning Attack Models, and Testing of Digital/VLSI Circuits.
Term Offered: Spring, Fall

EECS 8830 Power Semiconductor Device Engineering
[3 credit hours]
Semiconductor material physics, electrical transport physics, power switching, power amplification characteristics, power diodes, power MOSFETs, power MOS-bipolar devices, thyristors, and emerging devices.
Term Offered: Fall

EECS 8840 Compound Semiconductors and Devices
[3 credit hours]
This course will cover the fundamentals of various compound-semiconductor materials and devices, including materials and device physics, diodes, GaAs MESFETS, optoelectronic and photovoltaic devices and structures.
Term Offered: Spring, Fall

EECS 8860 RF Integrated Circuits
[3 credit hours]
Wireless principles, Passive RLC networks, Passive IC component characteristics, MOS Device Physics, Distributed Systems, Smith Chart and s-parameters, Bandwidth estimation, high frequency amplifier design, voltage references, noise, LNA design, mixers, feedback systems, RF power amplifiers, PLLs, Oscillators and Synthesizers, Phase Noise, Transceiver architectures.
Term Offered: Fall

EECS 8870 Advanced Analog Integrated Circuits
[3 credit hours]
Integrated Circuit Technology, Device Modeling, MOS Switches, Current Sinks and Sources, Bandgap References, Amplifiers, Operational Amplifiers, Comparators, Switched-Capacitor Circuits, Data Converters
Term Offered: Fall

EECS 8900 Independent Research
[1-6 credit hours]
Selected topics from current EE and CSE research with intensive investigation into recent literature in an area of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

EECS 8910 EECS Graduate Seminar
[1 credit hour]
Students will attend seminars and prepare a report reflecting their learning, questions and the impact of the seminar series. Students will also present their thesis or project plan and initial research results.
Term Offered: Spring, Fall

EECS 8960 Dissertation
[1-9 credit hours]
Graduate research towards the completion of a Doctoral Degree. Course may be repeated.
Term Offered: Spring, Summer, Fall

EECS 8970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency full-time internship to provide an experiential learning component to the Master's/Doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of U
Term Offered: Spring, Summer, Fall

EECS 8980 Current Topics In Electrical Engineering & Computer Science
[1-5 credit hours]
Current topics in the field of Electrical Engineering and Computer Science in areas of special interest to the class and the professor. Students will be expected to complete a written project based on a review of the research literature of the area covered in this course.
Term Offered: Spring, Summer, Fall

EECS 8990 Independent Study
[1-3 credit hours]
In depth study of a selected topic of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

Graduate Certificate in Cyber Security

Overview

The graduate certificate in cyber security is designed for graduate students who are (i) admitted to the M.S in electrical engineering or computer science engineering, or (ii) eligible to take graduate level engineering courses within the Electrical Engineering and Computer Science (EECS) Department at The University of Toledo. The program requires completion of four cyber security-related graduate courses (12 cr hr). The certificate program provides the software and hardware cyber security foundation needed to secure employment in the general domain of cyber security.

A minimum GPA of 3.0 with no grade below C is required for certificate completion.

ADMISSION REQUIREMENTS

Applicants to the cyber security certificate are expected to meet the admission requirements for the M.S. in electrical engineering or computer science & engineering degree program. Students currently enrolled in a graduate program can add the certificate to their matriculation - contact the College of Graduate Studies for more information.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Required for applicants whose degree is from a non-US institution.
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 3
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admission:

- **Fall:** March 1
- **Spring:** October 1
- **Summer:** January 15

PROGRAM REQUIREMENTS

The certificate consists of any 4 courses from the list below:

Code	Title	Hours
EECS 5720	Fundamentals of Cyber Security	3
EECS 5640	Inside Cryptography	3
EECS 5760	Computer Security	3
EECS 5790	Network Security	4
EECS 6650	Hardware Oriented Security and Trust	3

- PLO 1. Apply specialized knowledge and skills gained through the certificate program to solve cybersecurity and related computer science problems.
- PLO 2. Demonstrate competency commensurate with the master's education for one or more of the following activities, related specifically to cybersecurity: design, develop, integrate, simulate, prototype, test, verify or validate a component, subsystem, system in hardware or software.

M.S. in Cyber Security

OVERVIEW

Weiqing Sun, program director

Our master's degree program in cyber security provides an experiential learning-rich curriculum tailored to your interests and industry's needs. The program offers personalized capstone options for research and professional tracks with a large number of elective courses. Flexible course scheduling within our programs allows you to start taking classes during either fall or spring semester

Our research capstone options (thesis or project) engage you in cyber security research projects under the guidance of a faculty research mentor. Research capstones help you develop skills to investigate cyber security issues, discover new cyber security knowledge and present your research to professionals in industry or academia. After completing a research capstone, you'll be prepared to continue your research and development in cyber security areas or work in industry, practicing your professional skills. Our professional capstone option will train you with the latest technological trends in cyber security through a combination of core and elective courses. The capstone course, Experiential Learning in Cyber Security, prepares you to address real-world cyber-attacks and design defense strategies through The University of Toledo's Cyber Range. Guided by UToledo IT security professionals, the capstone course will help you develop the competencies you need to work as a cyber security professional in a rapidly evolving IT world. You will be required to take 30 credit hours to graduate.

For more information, please check the program website (https://www.utoledo.edu/engineering/graduate-studies/cyber.html) and contact the Program Director (Dr. Weiqing Sun, weiqing.sun@utoledo.edu).

ADMISSIONS REQUIREMENTS

Prospective students must have a bachelor's degree in a computer science or related field. For other STEM graduates, prerequisite undergraduate-level foundation courses in computer programming, computer networks, data structures, and operating systems are required. University of Toledo equivalent courses are shown below. Admissions are made on an individual basis and take into consideration the applicant's previous academic record, test results, the intended area of study, and the needs and capacity of the College of Engineering.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 2.8/4.0 grade point average from previous undergraduate coursework or a 3.0/4.0 for previous graduate coursework
- **Application:** UToledo application is required
- **GRE:** Required for applicants who select a research capstone option and whose degree is from a non-US institution.
- **Transcripts:** Required
- **Statement of Purpose:** Required (in response to a cyber security prompt)
- **Letters of Recommendation:** 3 (with at least one from an employer or a professor)
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.
- **Resume:** Required

Application priority deadlines for admissions decisions:

- **Fall:** No deadline
- **Spring:** No deadline
- **Summer:** Contact program

For non-computer science STEM applicants, University of Toledo prerequisite coursework equivalencies for program admission are listed below.

Code	Title	Hours
Programming - one course or equivalent		
CSET 1200	Object Oriented Programming and Data Structures	
EECS 1510	Introduction To Object Oriented Programming	
Computer Networks - one course or equivalent		
CSET 4750	Computer Networks And Data Communication	
EECS 3150	Data Communications	
Data Structures and Algorithms - one course or equivalent		
CSET 3150	Introduction to Algorithms	
EECS 2510	Non-Linear Data Structures	
Operating Systems - one course or equivalent		
CSET 4350	Operating Systems	
EECS 3540	Operating Systems And Systems Programming	

PROGRAM REQUIREMENTS

The MS in Cyber Security degree has three capstone options: thesis, project, and coursework. The program requirements for each are described below.

Code	Title	Hours
Core Courses		10
EECS 5720	Fundamentals of Cyber Security	
EECS 5790	Network Security	
EECS 6650	Hardware Oriented Security and Trust	
Engineering Elective Courses - see capstone for required cr hr		
EECS 5640	Inside Cryptography	
EECS 5760	Computer Security	
EECS 5770	Computer Hacking and Forensic Analysis	
EECS 5520	Advanced Systems Programming	
EECS 5390	Wireless And Mobile Networks	
CYBR 5930	Cyber Security Seminar	
CYBR 6990	Independent Study in Cyber Security	
CYBR 6800	Experiential Learning in Cyber Security	
CYBR 6970	Graduate Engineering Internship	
Select up to two (thesis option) or up to three (project/coursework option) of the following:		
CIVE 5710	Advanced Engineering Systems Modeling	
EECS 5120	Introduction to Fuzzy Systems and Applications	
EECS 5460	Power Systems Management	
EECS 5500	Programming for the World Wide Web	

EECS 5560	Database Systems I	
EECS 5740	Artificial Intelligence	
EECS 5750	Machine Learning	
EECS 6180	Biologically Inspired Computing	
EECS 6320	Data Compression For Multimedia Communication	
EECS 6340	Modern Communications Engineering I	
EECS 6350	Modern Communications Engineering II	
GNEN 5700	Applied Probability and Statistics	
MIME 5460	MATLAB and C/C++ for Engineers	
MIME 6000	Advanced Engineering Mathematics I	
Non-Engineering Elective Courses		3
INFS 6050	Information Systems Fundamentals	
INFS 6150	Business Intelligence Management	
INFS 6450	Data Mining	
INFS 6560	Business Systems Analysis and Design	
INFS 6710	Management of Information Systems Security	
LAWM 5000	Law And The Legal System	
LAWT 6600	Special Topics (Privacy and Data Security (College of Law, spring))	
MATH 5640	Statistical Computing	
Capstone option		17
MS thesis (9 cr hr CYBR 6960)		
CYBR 6960	Cyber Security Research and Thesis	
Engineering electives - 8 cr hr		
MS project (6 cr hr CYBR 6920)		
CYBR 6920	Cyber Security Project	
Engineering electives - 11 cr hr		
Coursework only (3 cr hr CYBR 6800)		
CYBR 6800	Experiential Learning in Cyber Security	
Engineering electives - 14 cr hr		
Total Hours		**30**

Combined bachelor's to master's- Cyber Security

Undergraduate students accepted to the **BS to MS in Cyber Security** option will be admitted to the **MS in Cyber Security** and allowed to complete up to three graduate level classes (nine credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in to the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) EECS 5720, EECS 5770, and EECS 5740 may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

Example Plan of Study for the Thesis Option:

First Year		
First Term		**Hours**
EECS 5720	Fundamentals of Cyber Security	3
EECS 5760	Computer Security	3
EECS 6650	Hardware Oriented Security and Trust	3
CYBR 5930	Cyber Security Seminar	0
	Hours	**9**
Second Term		
EECS 5640	Inside Cryptography	3
EECS 5790	Network Security	4
CYBR 6990	Independent Study in Cyber Security	2
CYBR 5930	Cyber Security Seminar	0
	Hours	**9**
Third Term		
CYBR 6960	Cyber Security Research and Thesis	1
	Hours	**1**
Second Year		
First Term		
INFS 6710	Management of Information Systems Security	3
CYBR 6960	Cyber Security Research and Thesis	6
CYBR 5930	Cyber Security Seminar	0
	Hours	**9**
Second Term		
CYBR 6960	Cyber Security Research and Thesis	2
CYBR 5930	Cyber Security Seminar	0
	Hours	**2**
	Total Hours	**30**

Example plan of study for the Project Option:

First Year		
First Term		**Hours**
EECS 5720	Fundamentals of Cyber Security	3
EECS 5760	Computer Security	3
EECS 6650	Hardware Oriented Security and Trust	3
CYBR 5930	Cyber Security Seminar	0
	Hours	**9**
Second Term		
EECS 5640	Inside Cryptography	3
EECS 5790	Network Security	4
CYBR 6990	Independent Study in Cyber Security	2
CYBR 5930	Cyber Security Seminar	0
	Hours	**9**

Second Year		
First Term		
CYBR 6920	Cyber Security Project	3
CYBR 6800	Experiential Learning in Cyber Security	3
INFS 6710	Management of Information Systems Security	3
CYBR 5930	Cyber Security Seminar	0
	Hours	**9**
Second Term		
CYBR 6920	Cyber Security Project	3
CYBR 5930	Cyber Security Seminar	0
	Hours	**3**
	Total Hours	**30**

Example Plan of Study for the Coursework-only Option:

First Year		
First Term		**Hours**
EECS 5720	Fundamentals of Cyber Security	3
EECS 5760	Computer Security	3
EECS 6650	Hardware Oriented Security and Trust	3
CYBR 5930	Cyber Security Seminar	0
	Hours	**9**
Second Term		
EECS 5640	Inside Cryptography	3
EECS 5790	Network Security	4
LAWT 6600	Special Topics (Privacy and Data Security)	2
CYBR 5930	Cyber Security Seminar	0
	Hours	**9**
Second Year		
First Term		
EECS 5750	Machine Learning	3
CYBR 6990	Independent Study in Cyber Security	3
CYBR 6800	Experiential Learning in Cyber Security	3
CYBR 5930	Cyber Security Seminar	0
	Hours	**9**
Second Term		
EECS 5770	Computer Hacking and Forensic Analysis	3
CYBR 5930	Cyber Security Seminar	0
	Hours	**3**
	Total Hours	**30**

- PLO 1. Understand the cyber security challenges in contemporary networks and software systems.
- PLO 2. Demonstrate the proficiency in various tools and utilities used in cyber security.
- PLO 3. Evaluate security mechanisms in terms of their effectiveness and appropriateness for computer and network systems.
- PLO 4. Understand the ethical issues related to securing information systems and critical infrastructure.
- PLO 5. Communicate effectively, both orally and in writing, with other security professionals.
- PLO 6. Apply appropriate security methods and mechanisms to protect enterprise network systems.
- PLO 7. (Thesis and Project Capstones) Research cyber security issues, discovery new knowledge, and present the research results to professionals in industry or academia.

M.S. in Electrical Engineering

OVERVIEW

The Master of Science in electrical engineering (M.S. EE) program is open to qualified applicants with a B.S. degree in electrical engineering or a closely related field.

Graduate courses and research include topics in communications; controls, signal processing; machine vision and imaging; power systems; power electronics; electronic materials and devices; photovoltaic devices; device modeling, laser-based advanced processing; renewable energy and smart grid; electro-optics and photonics; microelectronics; fault tolerance and reliability; electromagnetics; computer aided design and simulation; microwave electronics, antennas, and plasma physics; and hardware-oriented security and trust.

The program is offered in a thesis-option version or in two non-thesis option versions:

1. **Thesis option:** A minimum of 30 credit hours of approved graduate study including 9 credit hours of M.S. Thesis under the supervision of an EECS Department faculty member is required. Students are required to successfully complete the oral defense of the thesis work and upload the thesis document to the OhioLink electronic repository.
2. **Non-thesis options:** The degree requirements for M.S with non-thesis option are available with the approval of the Department Chair or the Department Graduate Program Director.
   a. M.S. with project option: Students are required to complete 30 credit hours of an approved graduate study including 6 hours of M.S. Project as specified by individual department guidelines and requirements. Students are required to submit a typed Project Report to the department-approved committee, consisting of the student's advisor and another faculty member.
   b. M.S. with coursework-only option: Students are required to complete a minimum of 30 credit hours of approved graduate-level course work.

The program prepares students with advanced and up-to-date knowledge and skills to pursue careers in the various fields of electrical engineering. The M.S. degree provides the foundation needed to become a productive researcher or a developer of innovative solutions to technological problems in the field.

ADMISSION REQUIREMENTS

Admission to the M.S. in electrical engineering program requires a B.S. degree in electrical engineering or a closely related field.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 2.8/4.0 grade point average for undergraduate coursework from a U.S. institution; a 3.0/4.0 for undergraduate coursework from an international institution; or a 3.3/4.0 for previous graduate coursework.
- **Application:** UToledo application required
- **GRE:** Required for applicants whose degree is from a non-US institution.
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 2
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** March 1
- **Spring:** October 1
- **Summer:** Contact department

Admission decisions are made on an individual basis and take into consideration the applicant's test results and previous academic record, the intended area of study, and the capacity of the EECS department.

PROGRAM REQUIREMENTS

MS EE program students can select one of the options below.

1. Master of Science degree with Thesis option: A minimum of 30 credit hours of approved graduate study, including nine credit hours of Master of Science thesis under the supervision of a faculty member, is required. Students are required to submit a written thesis and successfully complete the oral defense of the thesis work.
2. Master of Science degree with Non-Thesis option: The degree requirements for the Master of Science with non-thesis option are:
   a. Master of Science degree with Project option: Students are required to complete 30 credit hours of approved graduate-level work, including six hours of Master of Science project as specified by the individual department guidelines and requirements. Students are required to submit a written project report to the department.
   b. Master of Science degree with Course Work-only option: Students are required to complete 30 credit hours of approved graduate-level course work

Requirements and rules:

1. Students must submit a Plan of Study by the end of the 1st semester, which must be approved by a faculty advisor and the graduate program director.
2. Students must take one credit hour (included in the required 30 hours for the program) of the EECS graduate seminar course EECS 5930 with a maximum of two excused absences in the semester.
3. Students admitted to the MSEE must also be admitted into one of the associated "specialization" areas based on their undergraduate degree and background.
   a. This is accomplished during orientation week before the first semester or during the first week of the semester. The graduate Program Director (GPD) will advise students that they must select an available "specialization area" within the degree program into which they are admitted before they are permitted to register. Not all listed specialization areas may be available during any given academic year.
   b. Once the student chooses a "specialization area", then the student must consult with the GPD to secure his/her signature for permission to register for the courses in that specific area, which must be completed before the first semester starts or in the first week of the semester.
   c. Students must register for all core courses offered from the specialization area during that term, and if not all core courses are available during that term, then additional courses must be included from the "recommended electives" list as required by the registration status of the student. However, student must take the remaining core courses for the chosen specialization area during their next immediate term of offering.
4. Student admitted into a specialization area associated with the the MSEE program must take all required core courses as designated for that specialization area.
   - Core courses may be substituted by recommended electives under unique circumstances and on an exceptional and case-by-case basis. This is so if a core course cannot be offered by the department for foreseeable future due to reasons outside the control of department, which may include but not limited to, such as faculty unavailability or student having taken those courses as part of BS/MS program at UT or a transfer student into our MS programs etc.
     - The procedure to follow to substitute a required core is as follows: faculty adviser, but not the student, must in writing request substitution of a core course with a recommended elective or another course which may be from a different specialization area within the degree program with a detailed rationale from the EECS Graduate Committee whose written and documented approval of such requests is required for them to take effect.
5. Students must take at least 15 credit hours of graduate level EECS courses, specifically 3 core courses of a specialization area excluding independent study, independent research, masters' project or masters' thesis hours.
6. Students must take at least 6 credit hours of 6000-level courses excluding masters' thesis, independent study, masters' project or independent research.

7. Non-compliance with the requirements may result in a “HOLD” being put on student account preventing any further registration actions.

A table with required and recommended courses for each specialization area is included in the attached Program Restructuring document below.

Students are encouraged to include higher-level math courses in their program, subject to approval of their advisers.

Courses taken on an audit basis do not count toward the degree. Courses outside of the College of Engineering require prior approval.

In order to be awarded the Master of Science degree, the student must have at least a B average (a minimum GPA of 3.0/4.0) for all graduate course credits in the program of study as well as for the entire graduate transcript. Only credit hours obtained with a letter grade of “C” or higher, or an “S” grade for the limited number of classes offered on a satisfactory or unsatisfactory basis, will fulfill the degree requirements.

MSEE with thesis option:

Code	Title	Hours
Core courses		9
Recommended courses		9
EECS 6990	Independent Study	2
EECS 5930	Electrical Engineering & Computer Science Seminar	1
EECS 6960	Master's Graduate Research And Thesis	9
Total Hours		**30**

MSEE with project option:

Code	Title	Hours
Core courses		9
Recommended courses		12
EECS 6990	Independent Study	2
EECS 5930	Electrical Engineering & Computer Science Seminar	1
EECS 5920	Projects	6
Total Hours		**30**

MSEE with courses-only option:

Code	Title	Hours
Core courses		9
Recommended courses		18
EECS 6990	Independent Study	2
EECS 5930	Electrical Engineering & Computer Science Seminar	1
Total Hours		**30**

- PLO 1. Apply specialized knowledge and skills gained through the MSEE program to solve complex electrical engineering problems.
- PLO 2. Demonstrate competency commensurate with the master's education for one or more of the following engineering activities: design, develop, integrate, simulate, prototype, test, verify or validate a component, subsystem, system in hardware or software.
- PLO 3. Demonstrate effective communication skills.
- PLO 4. Demonstrate professionalism appropriate to the discipline.

M.S. in Engineering (Computer Science & Engineering)

OVERVIEW

The Master of Science in Engineering with concentration in computer science and engineering (M.S.E. CSE) program is open to qualified applicants with a B.S. degree in computer science, computer engineering or a closely related field.

Graduate courses and research topics include computer systems design and applications (hardware and software); artificial intelligence; machine vision and imaging; computer networks; computer graphics and visualization; cyber security; hardware-oriented security and trust; social networking; and high performance computing.

The program is offered in a thesis-option version or in two non-thesis option versions:

1. **Thesis option:** A minimum of 30 credit hours of approved graduate study including 9 credit hours of M.S. Thesis under the supervision of an EECS Department faculty member is required. Students are required to successfully complete the oral defense of the thesis work and upload the thesis document to the OhioLink electronic repository.
2. **Non-thesis options:** The degree requirements for M.S with non-thesis option are available with the approval of the Department Chair or the Department Graduate Program Director.
   a. M.S. with project option: Students are required to complete 30 credit hours of an approved graduate study including 6 hours of M.S. Project as specified by individual department guidelines and requirements. Students are required to submit a typed Project Report to the department-approved committee, consisting of the student’s advisor and another faculty member.
   b. M.S. with coursework-only option: Students are required to complete a minimum of 30 credit hours of approved graduate-level course work.

ADMISSION REQUIREMENTS

Admission to the M.S.E. CSE program requires a B.S. degree in computer science, computer engineering or a closely related field.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 2.8/4.0 grade point average for undergraduate coursework from a U.S. institution; a 3.0/4.0 for undergraduate coursework from an international institution; or a 3.3/4.0 for previous graduate coursework.
- **Application:** UToledo application required
- **GRE:** Required for applicants whose degree is from a non-US institution.

- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 2
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** March 1
- **Spring:** October 1
- **Summer:** Contact department

Admission decisions are made on an individual basis and take into account the applicant's test results and previous academic record, the intended area of study, and the capacity of the EECS department.

PROGRAM REQUIREMENTS

MS in Engineering (concentration in Computer Science and Engineering) program (MSECSE) students can select one of the options below.

1. Master of Science degree with Thesis option: A minimum of 30 credit hours of approved graduate study, including nine credit hours of Master of Science thesis under the supervision of a faculty member, is required. Students are required to submit a written thesis and successfully complete the oral defense of the thesis work.
2. Master of Science degree with Non-Thesis option: The degree requirements for the Master of Science with non-thesis option are:
   a. Master of Science degree with Project option: Students are required to complete 30 credit hours of approved graduate-level work, including six hours of Master of Science project as specified by the individual department guidelines and requirements. Students are required to submit a written project report to the department.
   b. Master of Science degree with Course Work-only option: Students are required to complete 30 credit hours of approved graduate-level course work

Requirements and rules:

1. Students must submit a Plan of Study by the end of the 1st semester, which must be approved by a faculty adviser and the graduate program director.
2. Students must take one credit hour (included in the required 30 hours for the program) of the EECS graduate seminar course EECS 5930 with a maximum of two excused absences in the semester.
3. Students admitted to the MSECSE must also be admitted into one of the "specialization" areas associated with the MSECSE program and based on their undergraduate degree and background.
   a. This is accomplished during orientation week before the first semester or during the first week of the semester. The graduate Program Director (GPD) will advise students that they must select an available "specialization area" within the degree program into which they are admitted before they are permitted to register. Not all listed specialization areas may be available during any given academic year.
   b. Once the student chooses a "specialization area", then the student must consult with the GPD to secure his/her signature for permission to register for the courses in that specific area, which must be completed before the first semester starts or in the first week of the semester.
   c. Students must register for all core courses offered from the specialization area during that term, and if not all core courses are available during that term, then additional courses must be included from the "recommended electives" list as required by the registration status of the student. However, student must take the remaining core courses for the chosen specialization area during their next immediate term of offering.
4. Student admitted into a specialization area associated with the MSECSE program must take all required core courses as designated for that specialization area.
   - Core courses may be substituted by recommended electives under unique circumstances and on an exceptional and case-by-case basis. This is so if a core course cannot be offered by the department for foreseeable future due to reasons outside the control of department, which may include but not limited to, such as faculty unavailability or student having taken those courses as part of BS/MS program at UT or a transfer student into our MS programs etc.
     - The procedure to follow to substitute a required core is as follows: faculty advisor, but not the student, must in writing request substitution of a core course with a recommended elective or another course which may be from a different specialization area within the degree program with a detailed rationale from the EECS Graduate Committee whose written and documented approval of such requests is required for them to take effect.
5. Students must take at least 15 credit hours of graduate level EECS courses, specifically 3 core courses of a specialization area excluding independent study, independent research, masters' project or masters' thesis hours.
6. Students must take at least 6 credit hours of 6000-level courses excluding masters' thesis, independent study, masters' project or independent research.
7. Non-compliance with the requirements may result in a "HOLD" being put on student account preventing any further registration actions.

Students are encouraged to include higher-level math courses in their program, subject to approval of their advisers.

Courses taken on an audit basis do not count toward the degree. Courses outside of the College of Engineering require prior approval.

In order to be awarded the MS degree, the student must have at least a B average (a minimum GPA of 3.0/4.0) for all graduate course credits in the program of study as well as for the entire graduate transcript. Only credit hours obtained with a letter grade of "C" or higher, or an "S" grade for the

limited number of classes offered on a satisfactory or unsatisfactory basis, will fulfill the degree requirements.

MSE CSE with thesis option:

Code	Title	Hours
Core Courses		9
Recommended Courses		9
EECS 6990	Independent Study	2
EECS 5930	Electrical Engineering & Computer Science Seminar	1
EECS 6960	Master's Graduate Research And Thesis	9
Total Hours		**30**

MSE CSE with project option:

Code	Title	Hours
Core Courses		9
Recommended Courses		12
EECS 6990	Independent Study	2
EECS 5930	Electrical Engineering & Computer Science Seminar	1
EECS 5920	Projects	6
Total Hours		**30**

MSE CSE with courses-only option:

Code	Title	Hours
Core Courses		9
Recommended Courses		18
EECS 6990	Independent Study	2
EECS 5930	Electrical Engineering & Computer Science Seminar	1
Total Hours		**30**

- PLO 1. Apply specialized knowledge and skills gained through the MSECSE program to solve complex computer engineering or computer science problems.
- PLO 2. Demonstrate competency commensurate with the master's education for one or more of the following computer engineering or computer science activities: design, develop, integrate, simulate, prototype, test, verify or validate a component, subsystem, system in hardware or software.
- PLO 3. Demonstrate effective communication skills.
- PLO 4. Demonstrate professionalism appropriate to the discipline.

Ph.D. in Engineering (Computer Science & Engineering)

OVERVIEW

The Ph.D. degree in Engineering (with computer science and engineering concentration) is conferred on the basis of extended study and high scholarly attainment in the field of computer science and engineering. The students are expected to apply advanced and specialized knowledge and skills, gained through the program, to solve novel and complex problems in the domains of computer science or computer engineering, and develop appropriate professional skills. In the course of the program, the students will demonstrate effective communication skills and competency commensurate with the doctoral education by making an original and substantial contribution to the field of computer science or computer engineering.

Graduate courses and research include topics in computer systems design and applications (hardware and software); artificial intelligence; machine vision and imaging; computer networks; computer graphics and visualization; cyber security; hardware-oriented security and trust; social networking; and high performance computing.

The program prepares students with advanced and up-to-date knowledge and skills to pursue careers as scientists/researchers/educators in the various fields of computer science and computer engineering. The doctoral program provides the foundation needed to become leaders as well as productive scholars or developers of innovative solutions to technological problems in these fields.

ADMISSION REQUIREMENTS

Admission to the Ph.D. in Engineering (concentration in computer science and engineering) program requires a B.S. or an M.S. degree in computer science, computer engineering or a closely related field.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university.
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate and graduate coursework.
- **Application:** UToledo application required
- **GRE:** Required for applicants whose degree is from a non-US institution.
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** minimum of 2 required
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** March 1
- **Spring:** October 1
- **Summer:** Contact department

Admission decisions are made on an individual basis and take into account the applicant's test results and previous academic and research

record, the intended area of study, and the capacity of the EECS department to advise and support Ph.D. students and Ph.D. level research projects.

PROGRAM REQUIREMENTS

Ph.D. students must complete a total of at least 90 hours of graduate credit (including 45 credit hours of dissertation) beyond the bachelor's degree, or 60 credit hours beyond the M.S. degree. Doctoral candidacy requires selection of an academic advisor, formation of a dissertation committee, and satisfactory performance on the doctoral qualifying examination. Candidates are awarded the Ph.D. degree following:

1. Satisfactory completion of the requisite credit hours beyond the M.S. / B.S. degree (the M.S. or B.S. degree must be in a closely related field); and
2. Successful defense of a dissertation that constitutes a fundamental advancement of knowledge in the field.

The Ph.D. typically takes a minimum of three full years of graduate work beyond the M.S. degree.

The general requirements for the Ph.D. degree are:

- A minimum of 60 credit hours beyond the M.S. degree or a minimum of 90 credit hours beyond the B.S. degree. Out of these credit hours, a minimum of 45 credit hours should be devoted to research toward the student's dissertation.
- No more than three credit hours of independent study for students with an M.S. degree and no more than 9 credit hours of independent study for students with a B.S. degree may be counted toward the Ph.D. course requirement.
- The student must pursue, complete and publish a research manuscript that is demonstrated to be an original contribution to the field of study.
- The dissertation must be written and successfully defended publicly before the Ph.D. degree is conferred.
- Students must submit a minimum of two journal papers based on the dissertation research. Copies of the accepted/published papers, or official letters of acknowledgments for the submitted papers must be given to the graduate director at least one week prior to the dissertation defense date.
- The student is required to take the 1cr.h. EECS seminar course and pass with an S grade.

Ph.D. Qualifying Examination

The intent of the Ph.D. Qualifying Examination is to assess the student's potential for successfully completing doctoral level studies and research in the department. The students are tested in four areas: two based on the required core courses of the specialization area; and two based on the recommended courses list in the student's specialization areas, chosen in consultation with the student's advisor. The examination is given in two written parts.

Further details pertaining to the qualifying examination, as well as course registration requirements, Plan of Study requirements, and PhD proposal defense requirements can be found in the EECS Graduate Handbook.

A document containing the courses and the specialization areas of the PhD CSE program is attached below.

It is the responsibility of the student and the faculty advisor to formulate a program of study that satisfies the requirements for the Ph.D. degree. The student's program of study should promote depth of knowledge through one of the specialization areas associated with Computer Science and Engineering. The program of study must be approved by the faculty advisor, the Advisory Committee, the Graduate Program Director, the Associate Dean of Graduate Studies of the College of Engineering, and the College of Graduate Studies.

PhD/CSE (the student has a BS degree in CS, CE, or a related field - 90 cr hr required)

Code	Title	Hours
Core Courses		9
Recommended Courses		30
EECS 8990	Independent Study	5
EECS 5930	Electrical Engineering & Computer Science Seminar	1
EECS 8960	Dissertation	45
Total Hours		**90**

PhD/CSE (the student has an MS degree in CS, CS or a related field - a minimum of 60 cr hr required)

Code	Title	Hours
Core Courses		9
Recommended Courses		6
EECS 5930	Electrical Engineering & Computer Science Seminar	1
EECS 8960	Dissertation	45
Total Hours		**61**

- PLO 1. Apply advanced and specialized knowledge and skills gained through the program to solve novel and complex problems in the domains of computer science or computer engineering.\\n
- PLO 2. Demonstrate competency commensurate with the doctoral education by making an original and substantial contribution to the body of knowledge in computer science or computer engineering.\\n
- PLO 3. Demonstrate effective communication skills.\\n
- PLO 4. Demonstrate professional skills appropriate to the discipline.

Ph.D. in Engineering (Electrical Engineering)

OVERVIEW

The Ph.D. degree in Engineering (with concentration in electrical engineering) is conferred on the basis of extended study and high scholarly attainment in the field of electrical engineering. Students are expected to apply advanced and specialized knowledge and skills, gained through the program, to solve novel and complex problems in the domain of electrical engineering, and develop appropriate professional skills. In the course of the program, the students will demonstrate effective

communication skills and competency commensurate with the doctoral education by making an original and substantial contribution to the body of knowledge in electrical engineering.

Graduate courses and research include topics in communications; controls, signal processing; machine vision and imaging; power systems; power electronics; electronic materials and devices; photovoltaic devices; device modeling, laser-based advanced processing; renewable energy and smart grid; electro-optics and photonics; microelectronics; fault tolerance and reliability; electromagnetics; computer aided design and simulation; microwave electronics, antennas, and plasma physics; and hardware-oriented security and trust.

The program prepares students with advanced and up-to-date knowledge and skills to pursue careers as scientists/researchers/educators in the various fields of electrical engineering.#The doctoral program provides the foundation needed to become leaders as well as productive scholars or developers of innovative solutions to technological problems in these fields.

ADMISSION REQUIREMENTS

Admission to the Ph.D. in Engineering (concentration in electrical engineering) program requires a B.S. or M.S. degree in electrical engineering or a closely related field.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate and graduate coursework
- **Application:** UToledo application required
- **GRE:** Required for applicants whose degree is from a non-US institution.
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** minimum of 2 required
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** March 1
- **Spring:** October 1
- **Summer:** Contact department

PROGRAM REQUIREMENTS

Ph.D. students must complete a total of at least 90 hours of graduate credit (including 45 credit hours of dissertation) beyond the bachelor's degree, or 60 credit hours beyond the M.S. degree. Doctoral candidacy requires selection of an academic advisor, formation of a dissertation committee, and satisfactory performance on the doctoral qualifying examination. Candidates are awarded the Ph.D. degree following:

1. Satisfactory completion of the requisite credit hours beyond the M.S. / B.S. degree (the M.S. or B.S. degree must be in a closely related field); and
2. Successful defense of a dissertation that constitutes a fundamental advancement of knowledge in the field.

The Ph.D. typically takes a minimum of three full years of graduate work beyond the M.S. degree.

The general requirements for the Ph.D. degree are:

- A minimum of 60 credit hours beyond the M.S. degree or a minimum of 90 credit hours beyond the B.S. degree. Out of these credit hours, a minimum of 45 credit hours should be devoted to research toward the student's dissertation.
- No more than three credit hours of independent study for students with an M.S. degree and no more than 9 credit hours of independent study for students with a B.S. degree may be counted toward the Ph.D. course requirement.
- The student must pursue, complete and publish a research manuscript that is demonstrated to be an original contribution to the field of study.
- The dissertation must be written and successfully defended publicly before the Ph.D. degree is conferred.
- Students must submit a minimum of two journal papers based on the dissertation research. Copies of the accepted/published papers, or official letters of acknowledgments for the submitted papers must be given to the graduate director at least one week prior to dissertation defense date.
- The student is required to take the 1cr.h. EECS seminar course and pass with an S grade.

Ph.D. Qualifying Examination

The intent of the Ph.D. Qualifying Examination is to assess the student's potential for successfully completing doctoral level studies and research in the department. The students are tested in four areas: two based on the required core courses of the specialization area; and two based on the recommended courses list in the student's specialization areas, chosen in consultation with the student's advisor. The examination is given in two written parts.

Further details pertaining to the qualifying examination, as well as course registration requirements, Plan of Study requirements, and PhD proposal defense requirements can be found in the EECS Graduate Handbook.

It is the responsibility of the student and the faculty advisor to formulate a program of study that satisfies the requirements for the Ph.D. degree. The student's program of study should promote depth of knowledge by covering one of the specialization areas associated with Electrical Engineering. The program of study must be approved by the faculty advisor, the Advisory Committee, the Graduate Program Director, the Associate Dean of Graduate Studies of the College of Engineering, and the College of Graduate Studies.

PhD/EE (the student has a BS degree in EE or a related field - 90cr hr required)

Code	Title	Hours
Core Courses		9
Recommended Courses		30
EECS 8990	Independent Study	5
EECS 5930	Electrical Engineering & Computer Science Seminar	1
EECS 8960	Dissertation	45
Total Hours		**90**

PhD/EE (the student has an MS degree in EE or a related field - a minimum of 60 cr hr required)

Code	Title	Hours
Core Courses		9
Recommended Courses		6
EECS 5930	Electrical Engineering & Computer Science Seminar	1
EECS 8960	Dissertation	45
Total Hours		**61**

- PLO 1. Apply advanced and specialized knowledge and skills gained through the program to solve novel and complex problems in the domain of electrical engineering.
- PLO 2. Demonstrate competency commensurate with the doctoral education by making an original and substantial contribution to the body of knowledge in electrical engineering.
- PLO 3. Demonstrate effective communication skills.
- PLO 4. Demonstrate professional skills appropriate to the discipline.

Department of Mechanical, Industrial, and Manufacturing Engineering

Hossein Sojoudi, chair
Qiuying Zhao, graduate program director

Graduate students enrolled in the Department of Mechanical, Industrial and Manufacturing Engineering (M.I.M.E.) may pursue the following degree programs:

- Master of Science in Industrial Engineering
- Master of Science in Mechanical Engineering
- Doctor of Philosophy in Engineering, Industrial Engineering Concentration
- Doctor of Philosophy in Mechanical Engineering

The fields of mechanical and industrial engineering are diverse, offering opportunities in research, design, product development and manufacturing. Major areas of mechanical engineering include aerodynamics, fluid dynamics, solid mechanics, bioengineering, material sciences, nanotechnology, dynamics, automotive engineering, production and process, machine design, vibrations and control systems, and reliability-based design and optimization. Major areas of industrial engineering involve the development of integrated systems by using mathematical and social sciences, and engineering analysis. This work may be in the areas of operations research, production and supply chain engineering, management engineering, ergonomics and human factors engineering, safety engineering, or financial engineering. The department features state-of-the-art studies using modern equipment and techniques.

Research Focus Areas

The current research of the department focuses on the following areas:

- **Numerical and Experimental Thermal Fluid Sciences:** The computational and experimental thermal fluid science research focus group encompasses broad research activities. These include research in such areas as alternative energy, computational fluid dynamics and heat transfer, tribology, flow stability and transition, vortex dynamics, drag reduction, small and medium engine turbines, microgravity flows, thermal systems simulation, biofluid flow dynamics, turbulent boundary layer characterization, experimental methods using hot wire/film anemometry, laser Doppler velocimetry, particle image velocimetry, and flow visualization techniques.
- **Materials, Design, and Manufacturing**: The objectives of the materials, design, and manufacturing focus group are to conduct research that will advance the engineering knowledge base and lead to new processes and products in the broad areas of materials, manufacturing, mechanical systems, dynamic systems and control, mechanical behavior of materials and mechanical design. Specifically, the research thrust of this group includes but is not limited to material design and additive manufacturing, medical device innovation, and smart material systems, MEMS, biomechanics, design methodology, fatigue and fracture mechanics, machine dynamics, noise and vibration analysis and control, solid modeling, and robotics. An essential aspect of this group is the blend of practical experimental expertise with the benefits of computational technologies. Processes are understood from a "hands-on" perspective and expanded through defining theoretical models. Engineering materials are studied throughout their life cycle, from material design raw material acquisition, product creation and usage, remanufacturing, recycling, and final material disposal. Key expertise within this group includes internationally recognized faculty in robotics, biomechanics, additive manufacturing, and environmentally conscious manufacturing.

Degrees Offered

- Graduate Certificate in Aerospace Engineering (p. 57)
- Graduate Certificate in Manufacturing (p. 58)
- Graduate Certificate in Materials Science & Engineering (p. 58)
- Graduate Certificate in Mechatronics (p. 59)
- M.S. in Industrial Engineering (p. 60)
- M.S. in Mechanical Engineering (p. 61)
- Ph.D in Engineering (Industrial Engineering) (p. 63)
- Ph.D. in Mechanical Engineering (https://catalog.utoledo.edu/graduate/engineering/departments/mechanical-industrial-manufacturing-engineering/phd-mechanical-engineering/)

COURSES

MIME 5060 Manufacturing Engineering
[3 credit hours]
The course provides an overview of advanced manufacturing processes, manufacturing management, nano- and bio-manufacturing processes and their applications.
Term Offered: Spring, Fall

MIME 5080 Operations Research I
[3 credit hours]
This course focuses on the mathematical methods of Operations Research and their applications in engineering. Topics include the optimal solution of deterministic and stochastic mathematical models, modeling process, linear programming, the simplex method, duality theory and sensitivity analysis.
Term Offered: Spring, Summer, Fall

MIME 5100 Manufacturing Systems Simulation
[3 credit hours]
Discrete and continuous simulation models are used to study queuing networks, manufacturing and related engineering systems. Simulation languages and animation are covered. Statistical inference is used to draw conclusions and to identify the best system.
Term Offered: Spring, Fall

MIME 5230 Dynamics Of Human Movement
[3 credit hours]
The goal of this course is for students to be able to describe motions of the human body. Three-dimensional analysis and measurements of human body movements including kinematics, kinetics and energetics of human gait, anthropometry and application to bioengineering and orthopedics will be presented. Euler angles and the screw axis method will be used to describe three-dimensional motions.
Term Offered: Spring, Fall

MIME 5240 Experimental Methods in Orthopaedic Biomechanics
[3 credit hours]
Experimental techniques used in orthopedics and in the study of the musculoskeletal system including mechanical testing, experimental and analytical methods for stress analysis, strain gages, methods used in human motion analysis to include motion capture, force plates and EMG's. Course prerequisites: For undergraduate students: (BIOE 2200 or MIME 1650) and (BIOE 3110 or CIVE 1160) For graduate students: None
Prerequisites: (BIOE 2200 with a minimum grade of D- or MIME 1650 with a minimum grade of D-) and (BIOE 3110 with a minimum grade of D- or CIVE 1160 with a minimum grade of D-)
Term Offered: Spring, Fall

MIME 5280 Cad - Finite Element Methods
[3 credit hours]
Numerical solutions of boundary value problems, variational calculus and the principle of minimum potential energy, finite element formulation of two dimensional field and elasticity problems, axisymmetric elements, finite element programming.
Term Offered: Summer, Fall

MIME 5300 Advanced Mechanics Of Materials
[3 credit hours]
Theory of elasticity, plane stress and plane strain problems, yield criteria and failure theories, bending of beams, energy methods, curved flexural members, unsymmetric bending, torsion, shear center and axisymmetrically loaded members.
Term Offered: Spring, Fall

MIME 5310 Mechanics Of Composite Materials
[3 credit hours]
Review of elasticity of anisotropic solids, determination of mechanical properties of fiber-reinforced lamina, analysis and performance of laminated composites.
Term Offered: Spring

MIME 5320 Fatigue Of Materials & Structures
[3 credit hours]
Fatigue design methods; fatigue fracture mechanisms; cyclic deformation behavior and material cyclic properties; stress-based, and fracture mechanics-based methodologies to fatigue life prediction of smooth and notched members subjected to constant or variable amplitude loadings.
Prerequisites: CIVE 1160 with a minimum grade of D-
Term Offered: Spring, Fall

MIME 5350 Advanced Ceramics
[3 credit hours]
This course provides greater knowledge on the atomic bonding, crystal structure, crystal imperfections, phases and interfaces, microstructures, phase diagrams, phase transformation, transport and diffusion, metal deformation, fracture of materials, deterioration of materials, electronic and physical properties of ceramics.
Prerequisites: MIME 1650 with a minimum grade of C- and PHYS 2130 with a minimum grade of C-
Term Offered: Spring, Fall

MIME 5370 Advanced Materials for Automotive Structures
[3 credit hours]
An in#depth study of the broad range of engineering materials used in the construction of motor vehicles. Inter#relations between materials microstructure, components manufacturing process and components service behavior.
Prerequisites: (MIME 1650 with a minimum grade of C- and PHYS 2130 with a minimum grade of C-)
Term Offered: Spring, Fall

MIME 5380 Engineering Polymers and Rubbers
[3 credit hours]
Polymers and rubber are introduced through lecture and lab components at three levels- 1) synthesis and characterization, 2) thermal, molecular and mechanical properties, and 3) design considerations for engineering applications.
Prerequisites: (MIME 1650 with a minimum grade of C- and PHYS 2130 with a minimum grade of C-)
Term Offered: Spring, Fall

MIME 5390 Failure Analysis of Materials
[3 credit hours]
The failure analysis is a procedure to determine the physical cause of the failure of an element, component or industrial equipment. The course will be focused on material related and will present an introduction to the principles of failure analysis and the fundamental aspects to conduct a failure analysis investigation. A key component of the course is the discussion of real cases of failures (case studies), i.e. failures in mining machinery, chemical processing equipment, energy production, systems, aircraft and petrochemical industry components. This course provides the connection between mechanisms that are responsible for material failures and will address the characterization techniques used in failure analysis. Fundamental failure mechanisms in various materials applications including fracture of metals and alloys, failure in electronic devices, and environmental factor induced failures will be covered. Each categorized phenomenon will be approached by historical events to reveal the application and connection between the mechanism and the incidents.
Prerequisites: (MIME 1650 with a minimum grade of C- and PHYS 2130 with a minimum grade of C-)
Term Offered: Spring, Fall

MIME 5410 Alternative Energy
[3 credit hours]
This course focuses on the technical aspects of sustainable energy technologies, such as wind, solar, biomass, ocean waves/tides, geothermal, and hydropower; it also covers issues and applications related to storage, transportation, distribution, industrial usage, and buildings. The course investigates the progress, challenges, and opportunities of each technology to be both technically feasible and economically viable.
Term Offered: Spring, Fall

MIME 5420 Modeling and Control of Engineering Systems
[3 credit hours]
In this course students study physical modeling and feedback principles for control of mechanical and electrical systems. Transient response, root locus and frequency response principles are applied to the control of basic mechanical and electrical systems. PID control laws are emphasized.
Term Offered: Spring, Fall

MIME 5430 Advanced Automotive Control Systems
[3 credit hours]
This course covers the major aspects of automotive control, including engine, driveline, and complete vehicle control. This includes applications such as fuel and ignition control, ABS systems, gear-shifting, and vehicle velocity estimation.
Term Offered: Spring, Summer, Fall

MIME 5440 Advanced Mechatronics
[3 credit hours]
This course will give students hands-on experience with mechatronic systems and components. The mechatronics lab (NE-1063) will be used to demonstrate several mechatronics systems including inverted pendulums, suites of sensors and motors, and other more complex systems. A major part of the course will be a semester-long project where the students conceive, design, and build a mechatronic device. The components for this device, namely a Raspberry Pi and a variety of sensors and actuators, will be directly funded by the course fee.
Term Offered: Spring, Fall

MIME 5450 Advanced Automation Design
[3 credit hours]
This course will introduce the range of common components used in automation, including actuators, sensors, motors, linear guides, energy chain, industrial robots and light curtains. Students will practice (with feedback) walking through the design process in specifying, sizing, laying out and integrating these components. The course will use some elements of CAD, where CAD experience would be helpful, but this would also be a good opportunity to quickly build competence with CAD.
Term Offered: Spring, Fall

MIME 5460 Advanced MATLAB for Engineers
[3 credit hours]
MATLAB is a useful 'tool' for each engineer to have in their 'toolkit'. This course will review the basics of using MATLAB, identify best-practices (applicable to other programming languages as well), and then move on to examples of more-advanced functionality, e.g. image processing, Simulink control of mechatronic systems, numerically solving differential equations, GPU computation, and optimization. Programming experience would be helpful, but this would also be a good opportunity to rapidly grow programming skills with an easy-to-learn language. A major component of the course is a semester-long project where the student can choose a topic that is most relevant to their research or professional interests, or simply a new area that they're curious about, e.g. mechatronics and programming embedded systems.
Term Offered: Spring, Summer, Fall

MIME 5510 Turbomachinery
[3 credit hours]
Theory of energy transfer between fluid and rotor in turbomachines. Design of turbomachine components, axial flow compressors and fans, centrifugal compressors and pumps, axial flow turbines. Design theory and principles, performance analysis, and computational methods
Term Offered: Spring, Summer, Fall

MIME 5520 Heating, Ventilating & Air Conditioning
[3 credit hours]
Control of the thermal environment within enclosed spaces including psychometric properties of air heating and cooling, loads and factors affecting human comfort. Analysis of basic heating and refrigeration systems, heat pumps, heaters, utilization of solar energy, humidifiers, energy conservation and controls for systems.
Term Offered: Fall

MIME 5530 Internal Combustion Engines
[3 credit hours]
Study of Otto, Diesel, and Miller Cycles, performance characteristics, and construction details of internal combustion engines. Analysis of problems associated with air flow, fuel injection, combustion, cooling, supercharging, friction, lubrication, emissions, testing, and control.
Term Offered: Spring

MIME 5540 Jet Propulsion
[3 credit hours]
Mechanics and thermodynamics of jet propulsion. Fundamentals of high-speed flow. Analysis of gas turbine engine components: diffuser, compressor, turbine and nozzle. Investigation of characteristics of ramjets, turbojets, turbofans and turboprops. Introduction to solid and liquid rockets.
Prerequisites: MIME 3410 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

MIME 5550 Aerodynamics
[3 credit hours]
Fundamentals of aerodynamics, potential flow theory, aerodynamic forces and moments, introduction to numerical analysis, application to external and internal flows, theory of lift for infinite and finite wings, induced drag.
Term Offered: Spring, Fall

MIME 5560 Gas Dynamics
[3 credit hours]
Analysis of compressible flow phenomena including shock and detonation waves. Topics include wave propagation, isentropic flow, normal shock waves, oblique shock waves, Prandtl-Meyer flow, and analysis and application to supersonic airfoil theory, inlet, and nozzle.
Term Offered: Spring

MIME 5690 Reliability
[3 credit hours]
Reliability of components and multicomponent systems. Static and dynamic reliability models for both independent and dependent failures. Effects of redundancy. Reliability testing consideration.
Term Offered: Spring, Summer, Fall

MIME 5820 Sustainability Analysis and Design
[3 credit hours]
The course is intended to introduce students to sustainability analysis and design in manufacturing and service settings as related to mechanical and industrial engineering. It will cover solid waste minimization for manufacturers, life cycle analysis, and environmentally conscious design.
Term Offered: Spring, Fall

MIME 5830 Additive Manufacturing
[3 credit hours]
Additive manufacturing (AM) is a method of manufacturing that has been growing rapidly. In this course the students will learn about various AM technologies. They will also work with the required design software packages to create 3D models and 3D-print objects from the designed models.
Prerequisites: MIME 2650 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

MIME 5980 Special Topics
[1-6 credit hours]
A special topic at the graduate level in Mechanical, Industrial or Manufacturing Engineering to be offered as a course during a term by a faculty member.
Term Offered: Spring, Summer, Fall

MIME 6000 Advanced Engineering Mathematics I
[3 credit hours]
An advanced course in mathematical analysis for engineers. Topics include matrix methods, eigenvalues and eigenvectors, systems of equations, series representations including FFT, ordinary differential equations and Bessel functions. This course will make use of computer-aided-mathematics techniques and include engineering applications.
Term Offered: Fall

MIME 6100 Advanced Engineering Mathematics II
[3 credit hours]
Partial differential equations for engineering applications including elliptic, parabolic, hyperbolic differential and non-linear systems of equations. Solution procedures include separation of variables, Laplace transform methods, solutions using complex analysis including conformal mapping and numerical methods.
Prerequisites: MIME 6000 with a minimum grade of D-
Term Offered: Spring

MIME 6200 Advanced Dynamics
[3 credit hours]
Study of dynamics of a system of particles and rigid bodies using Newtonian and Lagrangian Mechanics including multi-body systems. Principles of nonlinear system dynamics and stability.
Term Offered: Spring

MIME 6300 Continuum Mechanics
[3 credit hours]
A unified approach to the study of the mechanics of continuous media; analysis of tensors; kinematics of material media; analysis of deformation and stress; the mathematical statement of the laws of conservation of mass, momentum and energy; formulation of the mechanical constitutive equations for various classes of solids and fluids.
Term Offered: Spring, Fall

MIME 6350 Elasticity
[3 credit hours]
Review of tensor analysis, analysis of stress and strain, three dimensional equations of elasticity, plane problems in rectangular Cartesian and polar coordinates.
Term Offered: Fall

MIME 6360 Plasticity
[3 credit hours]
Review of elastic stress-strain relations, analysis of strain rate and concept of stress rate, criteria of yielding and rules of plastic flow, elastoplastic bending and torsion, theory of slipline fields, mechanics of metal forming processes.
Term Offered: Spring

MIME 6380 Fracture Mechanics
[3 credit hours]
Principles of fracture mechanics and its applications to the prevention of fractures in components and structures, linear elastic and elastic-plastic fracture mechanics, fracture mechanisms, fracture toughness, applications to fatigue crack propagation.
Term Offered: Fall

MIME 6440 Computational Fluid Dynamics I
[3 credit hours]
Properties of various partial differential equations. Basics of finite difference methods. Governing equations of fluid mechanics and heat transfer. Numerical solution of inviscid flow equations. Methods for solving Euler equations. Treatment of shock waves. Applications to simple compressible flows. Numerical methods for boundary-layer type equations.
Term Offered: Fall

MIME 6450 Experimental Fluid Mechanics
[3 credit hours]
Digital data acquisition and analysis; limitations and interpretation of physical measurements; sources of errors and difficulties in experimental technique; advanced experimental methods for static and dynamic measurements in thermal systems and fluid flow.
Term Offered: Spring

MIME 6460 Intermediate Fluid Mechanics and Heat Transfer
[3 credit hours]
Development of the Navier-Stokes and the convective equations. Analysis of boundary-layer flows including similarity solutions, potential flows as well as convective heat transfer topics. This course is intended to provide a solid theoretical foundation in fluid mechanics and convective heat transfer for graduate students, preparing them for more specialized courses in Heath Transfer and Fluid Mechanics.
Term Offered: Spring, Fall

MIME 6470 Advanced Computational Fluid Dynamics
[3 credit hours]
This course presents numerical methods to solve hyperbolic equations for compressible fluids. The eigensystem and characteristics of the system of equations representing one-dimensional Euler flows are detailed in terms of conservative and primitive variables. The focus of this course is to introduce concepts of finite-volume upwinding schemes and numerical flux formulations. Numerical solution methods using both explicit and implicit schemes will be introduced in the class and be selectively exercised in the CFD coding project.
Prerequisites: MIME 3430 with a minimum grade of D- and MIME 3400 with a minimum grade of D-
Term Offered: Spring, Fall

MIME 6540 Computational Fluid Dynamics II
[3 credit hours]
Finite difference procedures applied to the solution of reduced forms of the Navier-Stokes equations. Numerical solution of compressible and incompressible forms of the Navier-Stokes equations for laminar and turbulent flows. Fundamental turbulence models. Solution enhancement methods including multi-grid schemes and the use of preconditioning. Grid generation procedures using algebraic and differential equation methods. Structured versus unstructured grid methods. Grid adaptation procedures. Computer program applications.
Prerequisites: MIME 6440 with a minimum grade of D-
Term Offered: Spring

MIME 6550 Turbulent Flow
[3 credit hours]
Study of the nature, origin and dynamics of turbulence. Governing equations of turbulent flows. Internal and external flows. Aspects of free shear flow, turbulent boundary layers and statistical descriptions are presented. Numerical and experimental methods applied to turbulent flow.
Term Offered: Spring, Fall

MIME 6570 Advanced Fluid Mechanics
[3 credit hours]
Review of general governing equations, stability of laminar flows, transition to turbulence, incompressible turbulent flows, compressible boundary layer flow, and a selected topic chosen with the class.
Prerequisites: MIME 6460 with a minimum grade of D-
Term Offered: Spring

MIME 6580 Advanced Heat Transfer
[3 credit hours]
Analytical and numerical methods for steady and transient heat conduction, convective heat transfer in boundary layers, models for external and internal forced flows, free flows, influence of turbulence, and phase change.
Prerequisites: MIME 6460 with a minimum grade of D-
Term Offered: Spring, Fall

MIME 6590 Advanced Gas Dynamics
[3 credit hours]
One-dimensional steady flows of prefect gases: fundamental laws and basic equations for subsonic, transonic, and supersonic processes. Multidimensional flows: exact solutions; linearized flows; characteristics; supersonic nozzle design. Unsteady one-dimensional flows with discontinuities. Measurements in compressible flows. A selected topics in viscous, heat conducting compressible flows and boundary layers.
Prerequisites: MIME 4560 with a minimum grade of D-
Term Offered: Spring

MIME 6650 Advanced Material Science and Engineering
[3 credit hours]
The course provides an overview of structure, properties, design considerations, processing and engineering application of engineering materials. Hard and Soft materials are introduced through lecture and demonstrations at three levels- 1) synthesis and characterization, 2) thermal, molecular and mechanical properties, and 3) design considerations for engineering applications.
Term Offered: Spring, Summer, Fall

MIME 6720 Design of Experiments
[3 credit hours]
Design and analysis of experiments including analysis of variance and regression analysis. Factorial, blocked and nested models are considered together with appropriate estimation and post ANOVA tests.
Term Offered: Fall

MIME 6810 Assembly And Joining Processes
[3 credit hours]
This course is comprised of two parts: joining processes and assembly systems. Commonly used joining methods, such as welding, mechanical fastening and adhesion are discussed. General principles of assembly are presented with extensive use of automobile assembly as an example.
Term Offered: Spring

MIME 6900 Independent Research
[1-16 credit hours]
Research credit hours toward the Master of Science degree in Mechanical, Industrial and Manufacturing Engineering Department. Students are to use the section number of their thesis/dissertation adviser.
Term Offered: Spring, Summer, Fall

MIME 6920 Special Projects
[1-6 credit hours]
A special project by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students interested in mechanical, industrial or manufacturing engineering.
Term Offered: Spring, Summer, Fall

MIME 6930 Graduate Seminar
[0 credit hours]
This is a seminar for graduate students in Mechanical, Industrial and Manufacturing Engineering. Topics include orientation to the graduate program and special topics by speakers from industry and other universities. Credit does not apply toward a graduate degree.
Term Offered: Spring, Fall

MIME 6960 Graduate Research and Thesis
[1-9 credit hours]
Masters thesis research.
Term Offered: Spring, Summer, Fall

MIME 6970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Master's/Doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

MIME 6980 Special Topics
[1-6 credit hours]
A special topic at the graduate level in Mechanical, Industrial or Manufacturing Engineering to be offered as a course during a term by a faculty member.
Term Offered: Spring, Summer, Fall

MIME 6990 Independent Study
[1-6 credit hours]
An independent study by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students in mechanical, industrial or manufacturing engineering.
Term Offered: Fall

MIME 8000 Advanced Engineering Mathematics I
[3 credit hours]
An advanced course in mathematical analysis for engineers. Topics include matrix methods, eigenvalues and eigenvectors, systems of equations, series representations including FFT, ordinary differential equations and Bessel functions. This course will make use of computer-aided-mathematics techniques and include engineering applications.
Term Offered: Fall

MIME 8100 Advanced Engineering Mathematics II
[3 credit hours]
Partial differential equations for engineering applications including elliptic, parabolic, hyperbolic differential and non-linear systems of equations. Solution procedures include separation of variables, Laplace transform methods, solutions using complex analysis including conformal mapping and numerical methods.
Prerequisites: MIME 8000 with a minimum grade of D-
Term Offered: Spring

MIME 8120 Advanced Measurement Systems
[3 credit hours]
Sensor selection, data acquisition system selection, evaluation of system response, digital sampling theory, statistical data analysis, space-time correlations, spectral analysis, analog and digital signal conditioning, and static and dynamic measurements.
Term Offered: Fall

MIME 8200 Advanced Dynamics
[3 credit hours]
Study of dynamics of a system of particles and rigid bodies using Newtonian and Lagrangian Mechanics including multi-body systems. Principles of nonlinear system dynamics and stability.
Term Offered: Spring

MIME 8300 Continuum Mechanics
[3 credit hours]
A unified approach to the study of the mechanics of continuous media; analysis of tensors; kinematics of material media; analysis of deformation and stress; the mathematical statement of the laws of conservation of mass, momentum and energy; formulation of the mechanical constitutive equations for various classes of solids and fluids.
Term Offered: Spring, Fall

MIME 8350 Elasticity
[3 credit hours]
Review of tensor analysis, analysis of stress and strain, three dimensional equations of elasticity, plane problems in rectangular Cartesian and polar coordinates.
Term Offered: Fall

MIME 8360 Plasticity
[3 credit hours]
Review of elastic stress-strain relations, analysis of strain rate and concept of stress rate, criteria of yielding and rules of plastic flow, elastoplastic bending and torsion, theory of slipline fields, mechanics of metal forming processes.
Term Offered: Spring

MIME 8380 Fracture Mechanics
[3 credit hours]
Principles of fracture mechanics and its applications to the prevention of fractures in components and structures, linear elastic and elastic-plastic fracture mechanics, fracture mechanisms, fracture toughness, applications to fatigue crack propagation.
Term Offered: Fall

MIME 8440 Computational Fluid Dynamics I
[3 credit hours]
Properties of various partial differential equations. Basics of finite difference methods. Governing equations of fluid mechanics and heat transfer. Numerical solution of inviscid flow equations. Methods for solving Euler equations. Treatment of shock waves. Applications to simple compressible flows. Numerical methods for boundary-layer type equations.
Term Offered: Fall

MIME 8450 Experimental Fluid Mechanics
[3 credit hours]
Digital data acquisition and analysis; limitations and interpretation of physical measurements; sources of errors and difficulties in experimental technique; advanced experimental methods for static and dynamic measurements in thermal systems and fluid flow.
Term Offered: Spring

MIME 8460 Intermediate Fluid Mechanics and Heat Transfer
[3 credit hours]
Development of the Navier-Stokes and the convective equations. Analysis of boundary-layer flows including similarity solutions, potential flows as well as convective heat transfer topics. This course is intended to provide a solid theoretical foundation in fluid mechanics and convective heat transfer for graduate students, preparing them for more specialized courses in Heath Transfer and Fluid Mechanics.
Term Offered: Spring, Fall

MIME 8470 Advanced Computational Fluid Dynamics
[3 credit hours]
This course presents numerical methods to solve hyperbolic equations for compressible fluids. The eigensystem and characteristics of the system of equations representing one-dimensional Euler flows are detailed in terms of conservative and primitive variables. The focus of this course is to introduce concepts of finite-volume upwinding schemes and numerical flux formulations. Numerical solution methods using both explicit and implicit schemes will be introduced in the class and be selectively exercised in the CFD coding project.
Prerequisites: MIME 3430 with a minimum grade of D- and MIME 3400 with a minimum grade of D-
Term Offered: Spring, Fall

MIME 8540 Computational Fluid Dynamics II
[3 credit hours]
Finite difference procedures applied to the solution of reduced forms of the Navier-Stokes equations. Numerical solution of compressible and incompressible forms of the Navier-Stokes equations for laminar and turbulent flows. Fundamental turbulence models. Solution enhancement methods including multi-grid schemes and the use of preconditioning. Grid generation procedures using algebraic and differential equation methods. Structured versus unstructured grid methods. Grid adaptation procedures. Computer program applications.
Prerequisites: MIME 8440 with a minimum grade of D-
Term Offered: Spring

MIME 8550 Turbulent Flow
[3 credit hours]
Study of the nature, origin and dynamics of turbulence. Governing equations of turbulent flows. Internal and external flows. Aspects of free shear flow, turbulent boundary layers and statistical descriptions are presented. Numerical and experimental methods applied to turbulent flow.
Term Offered: Spring, Fall

MIME 8570 Advanced Fluid Mechanics
[3 credit hours]
Review of general governing equations, stability of laminar flows, transition to turbulence, incompressible turbulent flows, compressible boundary layer flow, and a selected topic chosen with the class.
Prerequisites: MIME 8460 with a minimum grade of D-
Term Offered: Spring

MIME 8580 Advanced Heat Transfer
[3 credit hours]
Analytical and numerical methods for steady and transient heat conduction, convective heat transfer in boundary layers, models for external and internal forced flows, free flows, influence of turbulence, and phase change.
Prerequisites: MIME 8460 with a minimum grade of D-
Term Offered: Spring, Fall

MIME 8590 Advanced Gas Dynamics
[3 credit hours]
One-dimensional steady flows of prefect gases: fundamental laws and basic equations for subsonic, transonic, and supersonic processes. Multidimensional flows: exact solutions; linearized flows; characteristics; supersonic nozzle design. Unsteady one-dimensional flows with discontinuities. Measurements in compressible flows. A selected topics in viscous, heat conducting compressible flows and boundary layers.
Prerequisites: MIME 4560 with a minimum grade of D-
Term Offered: Spring

MIME 8650 Advanced Material Science and Engineering
[3 credit hours]
The course provides an overview of structure, properties, design considerations, processing and engineering application of engineering materials. Hard and Soft materials are introduced through lecture and demonstrations at three levels- 1) synthesis and characterization, 2) thermal, molecular and mechanical properties, and 3) design considerations for engineering applications.
Term Offered: Spring, Summer, Fall

MIME 8720 Design of Experiments
[3 credit hours]
Design and analysis of experiments including analysis of variance and regression analysis. Factorial, blocked and nested models are considered together with appropriate estimation and post ANOVA tests.
Term Offered: Fall

MIME 8800 Advanced Manufacturing Systems Engineering
[3 credit hours]
Advanced studies of traditional manufacturing processes and advanced manufacturing systems with emphasis on manufacturing engineering processes and equipment, machine tools, process planning, design an operation of manufacturing systems.

MIME 8810 Assembly And Joining Processes
[3 credit hours]
This course is comprised of two parts: joining processes and assembly systems. Commonly used joining methods, such as welding, mechanical fastening and adhesion are discussed. General principles of assembly are presented with extensive use of automobile assembly as an example.
Term Offered: Spring

MIME 8900 Independent Research
[1-16 credit hours]
Research credit hours toward the doctoral degree for students in the Mechanical, Industrial and Manufacturing Engineering Department. Students are to use the section number of their dissertation adviser.
Term Offered: Spring, Summer, Fall

MIME 8920 Special Projects
[1-6 credit hours]
A special project by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students interested in mechanical, industrial or manufacturing engineering.
Term Offered: Spring, Summer, Fall

MIME 8930 Graduate Seminar
[0 credit hours]
This is a seminar for graduate students in Mechanical, Industrial and Manufacturing Engineering. Topics include orientation to the graduate program and special topics by speakers from industry and other universities. Credit does not apply toward a graduate degree.
Term Offered: Spring, Fall

MIME 8960 Dissertation
[1-9 credit hours]
Doctoral dissertation research credit hours for students in the Mechanical, Industrial and Manufacturing Engineering Department. Students are to use the section number of their dissertation adviser.
Term Offered: Spring, Summer, Fall

MIME 8970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Master's/Doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

MIME 8980 Special Topics
[1-6 credit hours]
A special topic at the graduate level in Mechanical, Industrial or Manufacturing Engineering to be offered as a course during a term by a faculty member.
Term Offered: Spring, Summer, Fall

MIME 8990 Independent Study
[1-6 credit hours]
An independent study by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students in mechanical, industrial or manufacturing engineering.
Term Offered: Summer, Fall

Graduate Certificate in Aerospace Engineering

OVERVIEW

Dr. Duane Ray Hixon, program director

The Graduate Certificate in Aerospace is designed for practicing mechanical engineers in the workforce and graduate students pursuing an M.S. in Mechanical Engineering who wish to demonstrate a focus in aerospace related curriculum. The certificate requires the completion of four courses (12 cr hr) from three of four aerospace related subject areas. Students can take these courses remotely. The certificate will develop the technical skills engineers need to conceptualize, design, develop, and test aerodynamic components and systems as well as communicate effectively with specialized engineering teams.

GRADUATE CERTIFICATE IN AEROSPACE ENGINEERING

The graduate certificate in aerospace engineering offers courses focused on fluid dynamics, heat transfer, aerothermodynamics, materials, design, and manufacturing. An understanding of these topics provides the basis for design and development of advanced aerospace systems.

PROGRAM CURRICULUM & REQUIREMENTS

The certificate is structured to require 12 credit hours of course work. A total of four (4) courses from at least three (3) of the subject areas listed under requirements must be successfully completed for the certificate.

Fluid Dynamics

Code	Title	Hours
MIME 5550	Aerodynamics	3
MIME 6440	Computational Fluid Dynamics I	3
MIME 6450	Experimental Fluid Mechanics	3
MIME 6460	Intermediate Fluid Mechanics and Heat Transfer	3

Heat Transfer

Code	Title	Hours
MIME 6460	Intermediate Fluid Mechanics and Heat Transfer	3
MIME 6580	Advanced Heat Transfer	3

Aerothermodynamics

Code	Title	Hours
MIME 5510	Turbomachinery	3
MIME 5540	Jet Propulsion	3
MIME 5560	Gas Dynamics	3

Materials, Design, and Manufacturing

Code	Title	Hours
MIME 5060	Manufacturing Engineering	3
MIME 5300	Advanced Mechanics Of Materials	3
MIME 6200	Advanced Dynamics	3
MIME 6720	Design of Experiments	3

- PLO (1) Demonstrate technical proficiency in aerospace topics
- PLO (2) Solve problems using mathematics and engineering principles in aerospace
- PLO (3) Discuss aerospace concepts clearly and concisely in both oral and written formats

Graduate Certificate in Manufacturing

OVERVIEW

Manufacturing is undergoing systemic changes as a result of technological advances and reshoring of manufacturing to the U.S. Adoption and integration of additive manufacturing technologies is changing the way products are made and opening product opportunities that were previously unfeasible. New manufacturing technologies, coupled with internet of things (IOT) and Green initiatives that reduce raw material costs and promote a circular economy, are shaping the manufacturing landscape of today. The graduate certificate in manufacturing will equip graduates with the knowledge and skills they need in this rapidly changing environment and enable employers to quickly identify graduates with the manufacturing expertise that they need.

Benefits

Many industries are seeking to upgrade the skills of their workforce as methods of manufacturing expand to include additive manufacturing, advanced automation, and automated assembly. Replacing legacy processes with new manufacturing methods also requires re-imagining engineering design for production with these new technologies.

The certificate can be stacked with another certificate for additional credentials or to complete an M.S. degree.

ADMISSION REQUIREMENTS

Applicants for the program are evaluated based on the admission requirements of the M.S. of mechanical engineering program. Students currently enrolled in a graduate program can add the certificate to their matriculation - contact the College of Graduate Studies for more information.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- Application: UToledo application required
- **GRE:** Not required
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 2 minimum; 3 preferred
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admission:

- **Fall:** No deadline
- **Spring:** Contact program
- **Summer:** Contact program

PROGRAM REQUIREMENTS

Code	Title	Hours
Required courses (select 3)		9
MIME 5060	Manufacturing Engineering	
MIME 5830	Additive Manufacturing	
MIME 6720	Design of Experiments	
MIME 6810	Assembly And Joining Processes	
Elective courses (select 2)		6
MIME 5080	Operations Research I	
MIME 5100	Manufacturing Systems Simulation	
MIME 5690	Reliability	
MIME 5800	Design For Manufacturability	
MIME 5820	Sustainability Analysis and Design	
MIME 6800		
Total Hours		**15**

- PLO 1. Be hired as practicing engineers in industries and government laboratories that are involved in the design, simulation, implementation, testing, analysis, and control of manufacturing processes and systems.
- PLO 2. Be prepared to continue their education with an advanced degree in mechanical engineering, industrial engineering, or other related field of engineering.
- PLO 3. Be prepared to continue their studies in other graduate programs to pursue careers in business or law.

Graduate Certificate in Materials Science & Engineering

OVERVIEW

Dr. A. H. Jayatissa, program director

The graduate certificate in material science and engineering offers courses focused on all classes of compounds - metals, ceramics, electronic materials, and polymers. Understanding materials properties and behaviors from the molecular level to the manufacturing scale provide a strong basis for materials selection, development, and advancement of specialized manufacturing methods.

The certificate requires completion of four material science-related courses (12 cr hr).

ADMISSION REQUIREMENTS

Applicants for the program are evaluated based on the admission requirements of the M.S. of mechanical engineering program. Students

currently enrolled in a graduate program can add the certificate to their matriculation - contact the College of Graduate Studies for more information.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Not required
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 2 minimum; 3 preferred
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application deadline:

- **Fall:** No deadline
- **Spring:** Contact Program
- **Summer:** Contact Program

To complete this 12 cr hr certificate, the students have to complete 4 courses from the following list of courses.

Code	Title	Hours
MIME 5350	Advanced Ceramics	3
MIME 5370	Advanced Materials for Automotive Structures	3
MIME 5380	Engineering Polymers and Rubbers	3
MIME 5390	Failure Analysis of Materials	3
EECS 5600	Solid State Devices	3

This certificate will offer students to learn advanced materials science and engineering in related fields such as metals, ceramics, electronic materials, and polymers. All of these materials are very important and essential components in mechanical and manufacturing engineering fields. Students will have the option to select any 4 courses (12 Cr Hrs) from the list of approved courses that cover the above topics.

- PLO 1. Identify, formulate, and solve complex engineering problems by applying the properties of materials.
- PLO 2. Design and produce different devices that meet specified needs based on different materials.
- PLO 3. Recognize ethical and professional responsibilities in materials science and engineering related to engineering manufacturing.
- PLO 4. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions related to materials science and engineering.
- PLO 5. Acquire and apply new knowledge as needed, using appropriate learning strategies.
- PLO 6. Communicate verbally or in writing through research papers, presentations, and inventions.
- PLO 7. Manage a technical project related to materials science engineering related technical fields, research projects, or industries.

Graduate Certificate in Mechatronics

OVERVIEW

Dr. George Choueiri, program director

The Mechatronics Certificate Program is designed for mechanical engineers already in the workforce to introduce mechatronics and the relevant sub-topics including programming, electrical hardware, dynamics and controls. The certificate requires completion of five mechatronics-related courses (15 cr hr), taken one course per semester, starting in the fall. The courses have thus far been taught in classrooms at The University of Toledo and students have also taken these courses remotely. This certificate will build the requisite skills that engineers need to conceptualize, design, build and test mechatronic devices, which have largely replaced traditional mechanical-only devices.

ADMISSION REQUIREMENTS

Applicants for the program are evaluated based on the admission requirements of the M.S. of mechanical engineering program.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Not required
- Transcripts: Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 2 minimum; 3 preferred
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions:

- **Fall:** No deadline
- **Spring:** Contact program

- **Summer:** Contact program

PROGRAM REQUIREMENTS

Mechatronics certificate (15 cr hr) - Courses taken in the following categories:

Code	Title	Hours
1. Control Area		3
MIME 5420	Modeling and Control of Engineering Systems	
MIME 5430	Advanced Automotive Control Systems	
2. Programming Area		3
MIME 5460	MATLAB and C/C++ for Engineers	
3. Hardware Area		3
EECS 5480	Power Electronics 1	
Other graduate level courses as approved by the program director		
4. Project		3
MIME 5440	Advanced Mechatronics	
5. Elective		3
MIME 5450	Advanced Automation Design	
MIME 5420	Modeling and Control of Engineering Systems	
MIME 5430	Advanced Automotive Control Systems	
Other graduate level course as approved by the program director		
Total Hours		**15**

- PLO 1) Demonstrate technical proficiency in mechatronics topics.
- PLO 2) Solve problems using mathematics and engineering knowledge in mechatronics.
- PLO 3) Explain course projects in mechatronics clearly and concisely in written and oral formats.

M.S. in Industrial Engineering

OVERVIEW

The occupation of industrial engineering involves the optimization of complex systems, processes or organizations. Industrial engineers develop integrated systems by using mathematical and social sciences, and engineering analysis. Their work may be in areas of operations research, production and supply chain engineering, management engineering, ergonomics and human factors engineering, safety engineering, or financial engineering.

ADMISSIONS REQUIREMENTS

Applicants must hold a B.S. in mechanical or industrial engineering, or a closely related field, from an accredited engineering program. If the baccalaureate is in a non-engineering or science area, students may be required to complete prerequisite courses without graduate degree credit. For transfer credit, students should refer to the general policies of the College of Graduate Studies.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Not required
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 2 minimum; 3 preferred
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** March 15
- **Spring:** October 1
- **Summer:** Contact department

PROGRAM REQUIREMENTS

The Master of Science degree program may be pursued with thesis, project and non-thesis options. Degree requirements for thesis, project, and coursework-only capstone options are provided in the table below. The department may specify additional credit or non-credit requirements for satisfactory completion as well as enhancement of degree objectives. The plan of study for the Master of Science degree must be filed before 16 hour of academic coursework has been completed. For full-time students, this normally will required that the plan of study be filed before registration for the second term.

A minimum of 12 cr hr of required or elective coursework must be at the 6000-level. A student may be required to complete more than the required minimum hours to satisfy prerequisite deficiencies specified as provisional admission conditions and/or to fulfill educational requirements for the program as specified by the advisor or department.

Code	Title	Hours
Mathematics core		**3**
MIME 6000	Advanced Engineering Mathematics I	3
or other graduate level math course with prior advisor approval		
Focus area core (2 courses)		**6**
MIME 5060	Manufacturing Engineering	3
MIME 6720	Design of Experiments	3
Elective coursework - cr hr requirement depends on capstone option		12-21
MIME 5060	Manufacturing Engineering	3
MIME 5070		3
MIME 5080	Operations Research I	3
MIME 5100	Manufacturing Systems Simulation	3
MIME 5230	Dynamics Of Human Movement	3

MIME 5280	Cad - Finite Element Methods	3
MIME 5300	Advanced Mechanics Of Materials	3
MIME 5350	Advanced Ceramics	3
MIME 5410	Alternative Energy	3
MIME 5690	Reliability	3
MIME 5800	Design For Manufacturability	3
MIME 5820	Sustainability Analysis and Design	3
MIME 5830	Additive Manufacturing	3
MIME 6650	Advanced Material Science and Engineering	3
MIME 6720	Design of Experiments	3
MIME 6800		3
MIME 6810	Assembly And Joining Processes	3
MIME 6910		3
or other graduate level engineering course with prior advisor approval		
Capstone option		**21**
MS thesis		
MIME 6960	Graduate Research and Thesis	9
Elective coursework		12
MIME 6930	Graduate Seminar (every semester)	0
MS Project		
MIME 6920	Special Projects	6
Elective coursework		15
MIME 6930	Graduate Seminar (every semester)	0
Coursework only		
Elective coursework		21
MIME 6930	Graduate Seminar (every semester)	0

- PLO 1) Demonstrate technical proficiency in their focus area topics
- PLO 2) Apply advanced engineering mathematics and/or statistical principles to solve engineering problems in one of the IE specialty areas
- PLO 3) Demonstrate ability to conduct a literature review
- PLO 4) Explain course projects in one of the IE specialty areas clearly and concisely in written and oral formats
- PLO 5) Thesis or project option: explain their research clearly and concisely in written and oral formats
- PLO 6) Thesis or project option: generate high quality engineering research

M.S. in Mechanical Engineering

OVERVIEW

The field of mechanical engineering is very diverse, offering opportunities in research, design, product development and manufacturing. Major areas of mechanical engineering include aerodynamics, fluid dynamics, solid mechanics, bioengineering, material sciences, nanotechnology, dynamics, automotive engineering, production and process, machine design, vibrations and control systems, and reliability-based design and optimization. The department features state-of-the-art studies using modern equipment and techniques.

ADMISSIONS REQUIREMENTS

Applicants must hold a B.S. in mechanical or industrial engineering, or a closely related field, from an accredited engineering program. If the baccalaureate is in a non-engineering or science area, students may be required to complete prerequisite courses without graduate degree credit. For transfer credit, students should refer to the general policies of the College of Graduate Studies.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Not required
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 2 minimum; 3 preferred
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** March 15
- **Spring:** October 1
- **Summer:** Contact department

PROGRAM REQUIREMENTS

The Master of Science degree program may be pursued with thesis, project and non-thesis options.

The MS in Mechanical Engineering degree can be completed in one of two research focus areas. Degree requirements for thesis, project, and coursework-only capstone options are provided in the tables below. The department may specify additional credit or non-credit requirements for satisfactory completion as well as enhancement of degree objectives. The plan of study for the Master of Science degree must be filed before 16 hour of academic coursework has been completed. For full-time students, this normally will require that the plan of study be filed before registration for the second term.

A minimum of 12 cr hr of required or elective coursework must be 6000-level. A student may be required to complete more than the required minimum cr hr to satisfy prerequisite deficiencies specified as provisional

admission conditions and/or to fulfill educational requirements for the program as specified by the advisor or department.

Materials, Design, and Manufacturing research focus area:

Code	Title	Hours
Mathematics core		**3**
MIME 6000	Advanced Engineering Mathematics I	3
or other graduate level math course with prior advisor approval		
Focus area core (2 courses)		**6**
MIME 5060	Manufacturing Engineering	3
MIME 5300	Advanced Mechanics Of Materials	3
MIME 6200	Advanced Dynamics	3
MIME 6720	Design of Experiments	3
Elective coursework - cr hr requirement depends on capstone option		**12-21**
MIME 5060	Manufacturing Engineering	3
MIME 5080	Operations Research I	3
MIME 5100	Manufacturing Systems Simulation	3
MIME 5230	Dynamics Of Human Movement	3
MIME 5240	Experimental Methods in Orthopaedic Biomechanics	3
MIME 5280	Cad - Finite Element Methods	3
MIME 5300	Advanced Mechanics Of Materials	3
MIME 5310	Mechanics Of Composite Materials	3
MIME 5430	Advanced Automotive Control Systems	3
MIME 5440	Advanced Mechatronics	3
MIME 5450	Advanced Automation Design	3
MIME 5460	MATLAB and C/C++ for Engineers	3
MIME 5800	Design For Manufacturability	3
MIME 5820	Sustainability Analysis and Design	3
MIME 5830	Additive Manufacturing	3
MIME 6300	Continuum Mechanics	3
MIME 6200	Advanced Dynamics	3
CIVE 6340		3
MIME 6350	Elasticity	3
MIME 6360	Plasticity	3
MIME 6380	Fracture Mechanics	3
MIME 6650	Advanced Material Science and Engineering	3
MIME 6720	Design of Experiments	3
MIME 6800		3
MIME 6810	Assembly And Joining Processes	3
or other graduate level engineering course with prior advisor approval		
Capstone option		**21**
MS thesis		
MIME 6960	Graduate Research and Thesis	9
Elective coursework		12
MIME 6930	Graduate Seminar (every semester)	0
MS Project		
MIME 6920	Special Projects	6
Elective coursework		15
MIME 6930	Graduate Seminar (every semester)	0
Coursework only		
Elective coursework		21
MIME 6930	Graduate Seminar (every semester)	0

COmputational & Experimental Thermal Sciences RESEARCH FOCUS AREA:

Code	Title	Hours
Mathematics core		**3**
MIME 6000	Advanced Engineering Mathematics I	3
or other graduate level math course with prior advisor approval		
Focus area core		**9**
MIME 6460	Intermediate Fluid Mechanics and Heat Transfer	3
Select 1 of the following courses:		
MIME 6440	Computational Fluid Dynamics I	3
MIME 6450	Experimental Fluid Mechanics	3
MIME 6470	Advanced Computational Fluid Dynamics	3
Select 1 of the following courses:		
MIME 6570	Advanced Fluid Mechanics	3
MIME 6580	Advanced Heat Transfer	3
Elective coursework - cr hr requirement depends on capstone option		**9-18**
MIME 5410	Alternative Energy	3
MIME 5510	Turbomachinery	3
MIME 5520	Heating, Ventilating & Air Conditioning	3
MIME 5530	Internal Combustion Engines	3
MIME 5540	Jet Propulsion	3
MIME 5550	Aerodynamics	3
MIME 5560	Gas Dynamics	3
MIME 6440	Computational Fluid Dynamics I	3
MIME 6450	Experimental Fluid Mechanics	3
MIME 6460	Intermediate Fluid Mechanics and Heat Transfer	3
MIME 6470	Advanced Computational Fluid Dynamics	3
MIME 6540	Computational Fluid Dynamics II	3
MIME 6570	Advanced Fluid Mechanics	3
MIME 6580	Advanced Heat Transfer	3
or other graduate level engineering course with prior advisor approval		
Capstone option		**18**
MS thesis		
MIME 6960	Graduate Research and Thesis	9
Elective coursework		9
MIME 6930	Graduate Seminar (every semester)	0
MS Project		
MIME 6920	Special Projects	6
Elective coursework		12
MIME 6930	Graduate Seminar (every semester)	0
Coursework only		

Elective coursework		18
MIME 6930	Graduate Seminar (every semester)	0

- PLO 1. Demonstrate technical proficiency in their focus area topics
- PLO 2. Apply advanced engineering mathematics and/or statistical principles to solve engineering problems in one of the ME specialty areas
- PLO 3. Demonstrate ability to conduct a literature review
- PLO 4. Explain course projects in one of the ME specialty areas clearly and concisely in written and oral formats
- PLO 5. Thesis or project option: explain their research clearly and concisely in written and oral formats
- PLO 6. Thesis or project option: generate high quality engineering research

Ph.D in Engineering (Industrial Engineering)

OVERVIEW

The Ph.D. program in Engineering with a concentration in Industrial Engineering is interdisciplinary and provides its students with an opportunity to study in a broad range of areas within mechanical engineering, industrial engineering, and other engineering areas within the College of Engineering and College of Medicine and Life Sciences. Ph.D. students could work at the intersection of materials engineering, medicine, and advanced manufacturing on a wide range of projects from innovative biomedical devices and technologies to advanced bearing, ice detection and prevention, human movements, robotics, recycling, fatigue, and innovative coatings. These projects include experimental characterization as well as multi-scale modeling and data analysis.

ADMISSIONS REQUIREMENTS

Admission for the Ph.D. program in Engineering with a concentration in Industrial Engineering requires the M.S. in Industrial Engineering or another engineering field provided the student shows evidence of an appropriate engineering background at the undergraduate level, including a minimum of two years of calculus through differential equations and one year of physics. Highly qualified B.S. engineering graduates can be admitted directly into the Ph.D. program.

Application requirements:

- **Degree:** Applicants must hold a four-year bachelor's degree from a regionally accredited college or university
- **GPA:** Applicants must have at least a 3.0/4.0 grade point average from previous undergraduate coursework or a 3.3/4.0 for previous graduate coursework
- **Application:** UToledo application required
- **GRE:** Not required
- **Transcripts:** Required
- **Statement of Purpose:** Required
- **Letters of Recommendation:** 2 minimum; 3 preferred
- **Proof of English language proficiency:** Required for students from non-English speaking countries. See University graduate admissions for minimum test score requirements and exceptions.

Application priority deadlines for admissions and funding decisions:

- **Fall:** March 15
- **Spring:** October 1
- **Summer:** Contact department

PROGRAM REQUIREMENTS

A satisfactory doctoral degree plan is developed jointly by the student and the dissertation adviser, subject to the approval of the department chair or graduate program director.

A minimum of 15 credit hours of regular 8000-level graduate courses taken for a letter grade beyond the M.S. degree is required for the doctoral degree program. Twelve of these 15 credit hours must be departmental graduate courses. Students entering the direct doctoral program with a bachelor's degree must complete 45 credit hours of graduate course work, of which 36 are regular departmental graduate courses beyond their bachelor's degree, and at least 27 credit hours must be at the 6000/8000 level. Other courses taken may include courses not listed as departmental courses, independent study courses, and courses taken S/U.

In addition to the above course requirements, all supported students are required to enroll and participate in a graduate seminar (MIME 8930 (https://catalog.utoledo.edu/search/?P=MIME%208930) or equivalent) each semester. The department may specify additional credit or non-credit requirements, for satisfactory completion as well as enhancement of degree objectives.

For transfer credit, students should refer to the general policies of the College of Graduate Studies.

Doctoral Qualifying Examination

Students can complete the PhD degree with a concentration Industrial Engineering. The MIME PhD qualifying includes earning a grade of (**A-**) in **three classes**. These three classes must be taken by all students (with or w/o a prior MS degree) who are seeking a PhD degree in MIME at the University of Toledo. Below are the three classes that students must take and obtain a satisfactory grade (**A-**). **These classes are currently offered at least once a year.**

Students must complete the mathematics course (Advanced Engineering Mathematics I – MIME 6000/8000) and the following two courses (a total of 3 classes):

- Design of Experiments (**Design of Experiment - MIME 6720/8720**)
- Manufacturing Engineering (**Manufacturing Engineering - MIME 5060**)

1. Students must follow the following steps:

A. Students must select their **PhD advisor by the end of their first academic semester**.

B. Students must **form their PhD committee by the end of their second semester. Proper** forms must be filled out and signatures of the committee members must be obtained. The doctoral dissertation committee must consist of at least five members. The chair of the committee will be the candidate's principal adviser. The other members usually will be the co-adviser (if any), faculty members or experts in a related field, with at least one committee member outside the department.

C. The **committee members** will check and verify whether the student has fulfilled grade requirements (A-) in the selected courses after students finish **their second semester**. Proper signatures to be obtained.

D. The **student's committee** can decide (before beginning of the 3rd semester) what **courses students must take** if the grade requirement is not fulfilled in each area/course.

E. Students must present to their committee by the end of their 3rd or 4th semester at MIME UToledo about their research topic (i.e. research questions, literature review, and preliminary data if available). The committee can probe fundamental understanding of the students related to their research. This is different than research progress and can focus on fundamentals in a student's area of study. Committee members will decide whether 1) the student is on the right track in research. 2) Whether the student has fundamental understanding related to the research area. If the committee members deem appropriate, they can suggest to students to take classes related to their research area and to improve fundamental understanding of the students. This can include an independent study with a research advisor.

If a student does not satisfy grade requirements in core classes or other classes suggested by the PhD committee, the committee must assess student's research performance, fundamental understanding, and grades to decide whether the student can continue in the PhD program. The PhD committee members will vote to make the final decision.

A student will be considered a Ph.D. candidate after this step.

F. Research Proposal Presentation: Students should present their research progress to their committee during a **formal proposal defense**.

G. Students can schedule their dissertation defense a semester following their successful proposal defense. Summer can count as a semester.

Note: If students change their PhD advisor **after** their qualifying exam requirements fulfilled, the student must select a new advisor and form a new committee and then can resume from **step E**. The new advisor and the student will decide about taking new classes and the committee might suggest that the student should take some other classes as well. If students change their advisor any time **before** fulfilling the qualifying exam, the student must find a new advisor and work with him/her to start from **step B**.

Doctoral Degree Candidacy

Doctoral candidacy requires satisfactory performance in the doctoral qualifying examination (steps A through E above), filing of an approved doctoral program plan, selection of an academic adviser (step A above), formation of a doctoral dissertation committee (step B above) and maintaining good academic performance as specified in the MIME Department Graduate Student Handbook.

When the above requirements have been met, the student may file his/her application for doctoral candidacy. The department requires that the application be filed within one year of the time the doctoral qualifying examination is passed. Doctoral students must have established candidacy for the doctoral degree before presenting and defending dissertation research.

Doctoral Dissertation

After the student and the adviser have agreed on a dissertation topic, the student must write a dissertation proposal. The student will present the proposal to the doctoral dissertation committee and successfully defend his/her dissertation proposal.

The signatures of the committee on the candidate's dissertation indicate approval of the dissertation research and represent the final certification of its adequacy.

- PLO 1) Demonstrate technical proficiency in their focus area topics.
- PLO 2) Explain doctoral level course projects clearly and concisely in written and oral formats.
- PLO 3) Explain their doctoral research clearly and concisely in written and oral formats.
- PLO 4) Generate high quality engineering research that is original, significant and consequential, and is publishable in high quality journals, book chapters, and conference proceedings.
- PLO 5) Participate in research proposal writing to fund their research.
- PLO 6) Teach undergraduate engineering courses.

College of Health and Human Services

Graduate Catalog 2026-2027

The UToledo College of Health and Human Services, an innovative college housed within a national public research university, prepares engaged professionals who improve the human condition in the region and the world. We deliver nationally recognized academic programs committed to discovery, teaching, professional practice and service that directly improve human lives.

Our programs enhance the human condition through the delivery of relevant learning, influential research, practical applications and meaningful community engagement. We are an educational resource to our community in population health, social justice, exercise & rehabilitation sciences and intervention and wellness. Our interprofessional collaborations, effective integration of theory and practice, and commitment to relevant societal issues and opportunities will provide you with a well-rounded education; one that is comprised of didactic and clinical experiences that are dedicated to helping and improving the quality of life of those we serve. Whether you are starting college for the first time, returning to complete a degree, transferring from another college or just checking us out, we want to serve you. Our goal is your success.

MISSION:

The UToledo College of Health and Human Services, an innovative college housed within a national public research university, prepares engaged professionals who improve the human condition in the region and the world.

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Graduate Degrees/Certificates Offered

A list of degree programs offered in the College of Health and Human Services is provided below. Above each degree is the Department that offers that degree program. Program descriptions are provided in the information under each school.

DepartmenT of Exercise and Rehabilitation Sciences (p. 66)

Masters Degree Programs

MAster of Arts in Recreation and leisure studies (p. 78)

- Recreation Administration

MASTER OF ARTS IN SPEECH-LANGUAGE PATHOLOGY (p. 80)

Doctoral Degree Programs

- Doctor of Physical Therapy (p. 86)
- Occupational Therapy Doctorate (p. 82)

Department of Human Services (p. 89)

Masters Degree Programs

Master of Arts in Counselor Education (p. 100)

- Clinical Mental Health Counseling
- School Counseling

Master of Arts in School Psychology (p. 103)

MASTER OF SOCIAL WORK (p. 104)

Educational Specialist Degree Program

- Education Specialist in School Psychology (p. 106)

Graduate Certificate Programs

- Graduate Certificate in Clinical Mental Health Counseling (p. 108)
- Graduate Certificate in School Counseling (p. 109)

DEPARTMENT OF POPULATION HEALTH (p. 110)

Masters Degree Programs

MASTER OF PUBLIC HEALTH

- Environmental and Occupational Health (p. 115)
- Generalist (p. 117)
- Health Promotion and Education (p. 119)
- Public Health Epidemiology (p. 120)

MASTER OF SCIENCE IN OCCUPATIONAL HEALTH (p. 122)

- Industrial Hygiene

Dual Degree Program

- Doctor of Medicine and Master of Public Health[1]
  (Offered through the College of Health and Human Services and the College of Medicine and Life Sciences)

[1] Student must be accepted into the MD program first to be eligible for the dual degree.

Graduate Certificate Programs

- Certificate in Biostatistics and Epidemiology (p. 123)
- Certificate in Epidemiology (p. 124)
- Graduate Certificate in Public Health Emergency Response (p. 124)
- Certificate in Occupational Health (p. 125)

School of Nursing (p. 125)

Doctor Of Nursing Practice (DNP), Advanced Practice Nursing (p. 140)

- Adult Gerontology Acute Care Nurse Practitioner Concentration
- Family Nurse Practitioner Concentration
- Pediatric Primary Care Nurse Practitioner Concentration
- Psychiatric Mental Health Nurse Practitioner Concentration

Doctor of Nursing Practice in Nurse Anesthesia (p. 144)

Doctor Of Nursing Practice (DNP), Nurse Executive (p. 145)

Master Of Science In Nursing (MSN), Advance Practice Nursing (p. 147)

- Adult Gerontology Acute Care Nurse Practitioner Concentration
- Family Nurse Practitioner Concentration

- Pediatric Primary Care Nurse Practitioner Concentration
- Psychiatric Mental Health Nurse Practitioner Concentration

Master Of Science In Nursing (MSN), Graduate Entry (p. 150)

Graduate Certificate Programs

For Current Registered Nurses with a Graduate Degree in Nursing:

- Adult Gerontology Acute Care Nurse Practitioner (p. 151)
- Family Nurse Practitioner Graduate Certificate (p. 151)
- Pediatric Primary Care Nurse Practitioner Graduate Certificate (p. 153)
- Psychiatric Mental Health Nurse Practitioner Graduate Certificate (p. 153)

College Policies (Graduate Handbook)

College Of Graduate Studies

- College of Graduate Studies (p. 407)
- College Policies and Procedures and Handbook (p. 407)
- Academic Regulations (p. 412)
- Graduate Academic Policies (https://www.utoledo.edu/policies/academic/graduate/)

Departments

- Department of Exercise and Rehabilitation Sciences (p. 66)
- Department of Human Services (p. 89)
- Department of Population Health (p. 110)
- School of Nursing (p. 125)

Department of Exercise and Rehabilitation Sciences

ERIC LONGSDORF, chair

In the recreation professions, the master of arts in recreation and leisure studies with specializations in recreation administration or recreational therapy is available.

The department offers a master's degree in speech-language pathology.

The department offers a doctoral degree in physical therapy.

The department offers a doctoral degree in occupational therapy.

The department offers a master's degree in recreation and leisure studies.

Degrees Offered

- MA in Recreation and Leisure Studies (p. 78)
- MA in Speech Language Pathology (p. 80)
- Occupational Therapy Doctorate (p. 82)
- Doctor of Physical Therapy Program (p. 86)

EXSC 8960 Doctoral Dissertation In Exercise Science
[1-12 credit hours]
Directed research towards completion of the doctoral degree. Students may register for credit in more than one semester. Total dissertation credit toward the degree may not exceed 16 hours.
Term Offered: Spring, Summer, Fall

OCCT 7000 Foundations of Occupational Therapy
[3 credit hours]
This course introduces students to the history, philosophy, core concepts, ethics, and the domain and process of occupational therapy. Students also explore the basic tenets of therapeutic occupation and investigate the role that chosen occupations play within an individual's daily life. Professional skills in occupational analysis and professional communication are introduced and applied. Students also complete concurrent lab experiences with students from other health care professions as part of the university-wide Interprofessional Education Program. Prerequisite: Admission to OTD Program
Term Offered: Fall

OCCT 7010 OT Models of Practice I
[5 credit hours]
Examines the biomechanical model of practice including its musculoskeletal and kinesiological foundations. Includes assessments and interventions for prevention, adaptation, and compensation. Prerequisite: Admission to OTD Program
Term Offered: Fall

OCCT 7020 OT Models of Practice II
[5 credit hours]
An introduction to the nervous system, with emphasis on the neurological basis of human occupation and the effects of neurological conditions (disease, injury, and mental illness) on occupational performance. Explores neuroplasticity and neuro rehabilitation. Labs include neuroanatomy and clinical assessment. Prerequisite: Occupational Therapy Models of Practice I Co-requisite: Occupational Therapy Models of Practice III
Term Offered: Spring

OCCT 7030 OT Models of Practice III
[4 credit hours]
Explores historical and alternative conceptual frameworks of occupation and therapeutic occupation. Examines cognitively based and general models of practice. Presents related assessments and interventions for prevention, adaptation, and compensation. Prerequisite: Occupational Therapy Models of Practice I Co-requisite: Occupational Therapy Models of Practice II
Term Offered: Spring

OCCT 7040 OT Models of Practice IV
[5 credit hours]
Focuses on the occupational therapy process and models of practice for intervention with children and individuals with neurological impairments, including assessment and intervention. Prerequisite: Occupational Therapy Models of Practice II
Term Offered: Summer

OCCT 7110 OT Research I: Evidenced-Informed Practice
[4 credit hours]
Introduction to the principles of measurement and research design, with an emphasis on critically evaluating the design of research studies relevant to clinical practice. Examines quantitative and qualitative research methodologies. Introduces students to the OTD Scholarly Project.
Term Offered: Fall

OCCT 7120 OT Research II: Scholarly Project Proposal
[2 credit hours]
Provides structure for student, guided by faculty advisor, to define a research question, investigate the literature, explore the site(s) for data collection, and create a research proposal for their scholarly project.
Term Offered: Spring, Summer, Fall

OCCT 7130 OT Research III: Scholarly Project Implementation
[2 credit hours]
Provides structure for student to implement their scholarly project following approved methods.
Prerequisites: OCCT 7120 with a minimum grade of C
Term Offered: Spring, Summer, Fall

OCCT 7210 OT Advocacy I: Education in Healthcare
[2 credit hours]
Explores the role of occupational therapist as educator. Examines educational theory, instructional methods and technology, and evaluation of teaching effectiveness with patients, families, peers, supervisees, and community groups.
Term Offered: Fall

OCCT 7220 OT Advocacy II: Community & Academic Education
[2 credit hours]
Applies teaching principles as students assume the role of educators to the community. Explores the role of the therapist in design, development, implementation, and evaluation of occupational therapy curricula. Integrates presentation of self and professionalism.
Term Offered: Summer

OCCT 7310 FW and Professional Dev I
[1 credit hour]
Introduces Level I and Level II Fieldwork, and the Capstone Experience, including policy, procedures, and documentation and the portfolio assignment. Defines professional behavior and health care communication. Encourages discussion of Level I fieldwork experiences. Includes Level I fieldwork experience. Prerequisite: Admission to the OTD Program
Term Offered: Fall

OCCT 7320 FW and Professional Dev II
[1 credit hour]
Emphasizes interviewing clients for an occupational profile. Encourages discussion of Level I fieldwork experiences. Introduces the course sequence of the Capstone Experience. Includes Level I fieldwork experience. Prerequisite: Fieldwork and Professional Development Seminar I
Term Offered: Spring

OCCT 7330 FW and Professional Dev III
[1 credit hour]
Introduces Capstone Seminar opportunities in teaching, research, program development, or clinical practice. Introduces Capstone Manual and structure for planning the individualized Capstone Experience. Provides a forum for discussion fieldwork experiences. Summer Prerequisite: Fieldwork and Professional Development Seminar II
Term Offered: Summer

OCCT 7400 Conditions in OT
[2 credit hours]
Reviews the physical and mental health conditions that challenge successful and satisfying occupational performance, with an emphasis on the aspects of medical management and rehabilitation relevant to the role of the occupational therapist. Spring Prerequisite: Occupational Therapy Advocacy I
Term Offered: Spring

OCCT 7410 OT Foundations I: Domain & Process
[3 credit hours]
Introduces the history, philosophy, core concepts, ethics, and the domain and process of occupational therapy. Explores the basic tenets of therapeutic occupation and investigates the role that chosen occupations play within an individual's daily life. Professional skills in occupational analysis and professional communication are introduced and applied.
Term Offered: Fall

OCCT 7420 OT Foundations II: Models of Practice
[4 credit hours]
Explores historical and alternative conceptual frameworks of occupation and therapeutic occupation. Examines cognitively based and general models of practice. Presents related assessments and interventions for prevention, adaptation, and compensation.
Term Offered: Spring

OCCT 7430 OT Foundations III: Conditions
[2 credit hours]
Provides foundational knowledge of physical and mental health conditions and their impact on occupational performance and participation. Emphasizes medical management and rehabilitation relevant to the role of occupational therapy.
Term Offered: Spring

OCCT 7510 OT Practice I: Human Movement & Performance
[5 credit hours]
Examines the biomechanical model of practice including its musculoskeletal and kinesiological foundations. Includes assessments and interventions for remediation, prevention, adaptation, and compensation.
Term Offered: Fall

OCCT 7520 OT Practice II: Neuroscience
[5 credit hours]
An introduction to the nervous system, with emphasis on the neurological basis of human occupation and the effects of neurological conditions (disease, injury, and mental illness) on occupational performance. Explores neuroplasticity and neuro rehabilitation. Labs include neuroanatomy and clinical assessment.
Term Offered: Spring

OCCT 7530 OT Practice III: Children & Youth
[3 credit hours]
Focuses on the occupational therapy process and models of practice for intervention with children and youth, including assessment and intervention.
Term Offered: Summer

OCCT 7540 OT Practice IV: Neurorehabilitation
[3 credit hours]
Focuses on the occupational therapy process and models of practice for intervention with individuals with neurological impairments, including assessment and intervention.
Term Offered: Summer

OCCT 7710 OT Fieldwork & Professional Development I
[1 credit hour]
Introduces Level I and Level II Fieldwork and the Doctoral Capstone, laying the foundation for professional practice in occupational therapy. Explores fieldwork policies, procedures, and documentation, and the development a professional portfolio. Defines professional behavior and healthcare communication. Includes Level I fieldwork experience with reflective discussion.
Term Offered: Fall

OCCT 7720 OT Fieldwork & Professional Development II
[1 credit hour]
Emphasis on interviewing clients for an occupational profile and fostering cultural competence on occupational engagement. Includes Level I fieldwork experience with preparatory discussion.
Prerequisites: OCCT 7710 with a minimum grade of C
Term Offered: Spring

OCCT 7730 OT Fieldwork & Professional Development III
[1 credit hour]
Emphasizes observation as an assessment measure. Provides practice for planning and implementing client-centered occupation-based interventions including grading up and down, therapeutic use of self, and behavior management. Includes Level I fieldwork experience with reflective discussion.
Prerequisites: OCCT 7720 with a minimum grade of C
Term Offered: Summer

OCCT 8050 OT Models of Practice V
[5 credit hours]
Advances clinical reasoning for occupational therapy practice to support occupational performance throughout the lifespan, including prevention of occupational impairment. Prerequisite: Occupational Therapy Models of Practice IV Co-requisite: Occupational Therapy Models of Practice VI
Term Offered: Spring

OCCT 8060 OT Models of Practice VI
[4 credit hours]
Examines compensation-oriented models of practice including assistive technology, positioning, patient handling, and mobility. Presents occupational and non-occupational assessments and interventions for prevention, adaptation, and compensation. Prerequisite: Occupational Therapy Models IV Co-requisite: Occupational Therapy Models V
Term Offered: Fall

OCCT 8070 OT Models of Practice VII
[4 credit hours]
Examines contemporary and possible models of practice emphasizing wellness, health promotion, community care, population-based intervention and other emerging trends. Provides students with leadership experiences in program development. Prerequisite: Occupational Therapy Models of Practice VI Corequisite: Occupational Therapy Models of Practice VIII
Term Offered: Spring

OCCT 8080 OT Models of Practive VIII
[3 credit hours]
Models of practice emphasizing group occupational forms, group process, and therapeutic use of self in groups. Involves practice in assessment and intervention with persons experiencing both physical and mental health conditions. Prerequisite: Occupational Therapy Models of Practice VI Co-requisite: Occupational Therapy Models of Practice VII
Term Offered: Fall

OCCT 8120 Research in OT II
[3 credit hours]
Provides structure for student, guided by faculty mentor, to define a research question, investigate the literature, explore the site(s) for data collection, and prepare preliminary research proposal. Involves individual faculty contact. Spring Prerequisite: Research in Occupational Therapy I
Term Offered: Spring

OCCT 8130 Research in Occ Therapy III
[3 credit hours]
Provides structure for student to begin data collection after obtaining official approval of project by major advisor and institutional review board. Involves individual faculty contact. Fall, Spring, Summer Prerequisite: Research in Occupational Therapy II
Term Offered: Fall

OCCT 8140 OT Research IV: Scholarly Project Completion
[2 credit hours]
Includes completion of data collection and transitions to analysis of results employing accepted statistical and other accepted analytical methods.
Prerequisites: OCCT 7130 with a minimum grade of C
Term Offered: Spring, Summer, Fall

OCCT 8150 OT Research V: Scholarly Project Presentation
[2 credit hours]
Includes preparation and delivery of the research presentation as the culmination of the student's scholarly project.
Prerequisites: OCCT 8140 with a minimum grade of C
Term Offered: Spring, Summer, Fall

OCCT 8230 OT Advocacy III: Advocacy & Populations
[2 credit hours]
Identifies advocacy issues relevant to occupational therapy and introduces community resources that can enhance successful and satisfying reintegration back into home, school, work, and/or community. Explores legislation and ethical issues that influence health care provision.
Term Offered: Fall

OCCT 8240 OT Advocacy IV: Leadership & Management
[3 credit hours]
Examines leadership, management, and supervision of occupational therapy services in a dynamic health care system. Addresses legislative, regulatory, and payment issues affecting program development. Encourages leadership development.
Term Offered: Spring

OCCT 8340 FW and Professional Dev IV
[1 credit hour]
Addresses communication with children, family members, and health care professionals; ethics and safety; and cultural diversity. Students identify Capstone Practicum sites, site mentor(s), and the faculty mentor. A forum for discussion of Level I fieldwork experiences is provided. Level I fieldwork experience is included. Prerequisite: Fieldwork and Professional Development Seminar II
Term Offered: Fall

OCCT 8350 FW and Professional Dev V
[3 credit hours]
Addresses issues of clinical supervision; Level II fieldwork policy, procedures, and documentation; and professional development. A forum for discussion of Level I fieldwork experiences is provided. Students develop a comprehensive Capstone Proposal. Includes Level I fieldwork experience. Prerequisite: Fieldwork and Professional Development Seminar IV
Term Offered: Spring

OCCT 8360 Fieldwork Level II
[3 credit hours]
Provides a 12 - week, full-time, supervised fieldwork experience where students refine entry-level abilities to integrate occupational therapy theory, research, and practice under supervision and with collaboration of the academic institution. An on-line forum for discussion of Level II fieldwork experiences is provided. Prerequisite: Completion of academic content except research, which may be taken concurrently
Term Offered: Summer, Fall

OCCT 8370 Fieldwork Level II
[6 credit hours]
Provides a 12 - week, full-time, supervised fieldwork experience where students refine entry-level abilities to integrate occupational therapy theory, research, and practice under supervision and with collaboration of the academic institution. An on-line forum for discussion of Level II fieldwork experiences is provided. Prerequisite: OCCT 8360 and completion of academic content except research, which may be taken concurrently
Prerequisites: OCCT 8360 (may be taken concurrently) with a minimum grade of D-
Term Offered: Fall

OCCT 8380 Capstone Practicum
[6 credit hours]
Students develop skills in teaching, research, program development, advocacy or clinical practice with mentorship by faculty and on-site practitioners. This course, in combination with OCCT 8900 and OCCT 8910 requires documentation of 560 hours. Prerequisite: Level II FW, competency exam, all courses except research
Term Offered: Spring

OCCT 8400 Physical Agent Modalities and Other Non-Occupational Methods
[2 credit hours]
Addresses non-occupational methods including physical agent modalities and technology used with medically complex patients. Covers scientific underpinnings and regulatory guidelines for appropriate use of physical agent modalities in occupational therapy. Summer Prerequisite: Occupational Models of Practice VI
Term Offered: Summer

OCCT 8440 OT Foundations IV: Interprofessional Education
[1 credit hour]
Team-based interprofessional education focused on understanding the roles of members of healthcare teams, communication strategies, collaboration, and patient safety.
Term Offered: Fall

OCCT 8450 OT Foundations V: Program Development
[4 credit hours]
Examines contemporary and possible models of practice emphasizing wellness, health promotion, community care, population-based intervention and other emerging trends. Provides students with leadership experiences in program development.
Term Offered: Spring

OCCT 8550 OT Practice V: Physical Rehabilitation
[5 credit hours]
Focuses on necessary components of clinical intervention for individuals with physical disability including assistive technology, positioning, patient handling, and mobility.
Term Offered: Fall

OCCT 8560 OT Practice VI: Behavioral & Mental Health
[3 credit hours]
Focuses on necessary components of clinical intervention to improve behvioral and mental health for clients with both physical and mental health conditions, incuding group interventions, group process, and therapeutic use of self in groups.
Term Offered: Fall

OCCT 8570 OT Practice VII: Professional Reasoning Across the Lifespan
[5 credit hours]
Advances clinical reasoning for occupational therapy practice to support occupational performance throughout the lifespan, including prevention of occupational impairment.
Term Offered: Spring

OCCT 8580 OT Practice VIII: Clinical Care
[2 credit hours]
Focuses on the knowledge and skill to provide occupational therapy interventions in clinical settings, such as hand therapy and orthopedic clinics, hospitals, and acute and sub-acute hospitals. Includes labs and competencies for physical agent modalities and equipment used with medically complex patients.
Term Offered: Summer

OCCT 8740 OT Fieldwork & Professional Development IV
[2 credit hours]
Students begin Doctoral Capstone preparation through site selection and needs assessment for their casptone proposal. Course covers identifying a practicum site, securing site and faculty mentors, and dissemination options. Fieldwork topics include communication with children, families, and healthcare professionals; ethics and safety; and cultural diversity. Includes discussion of Level I fieldwork experiences.
Prerequisites: OCCT 7730 (may be taken concurrently) with a minimum grade of S
Term Offered: Fall

OCCT 8750 OT Fieldwork & Professional Development V
[1 credit hour]
Addresses issues of clinical supervision; prepares for Level II fieldwork by reviewing policy, procedures, and documentation. Emphasizes personal responsiblity for learning and professional development. A forum for discussion of Level I fieldwork experiences is provided.
Prerequisites: OCCT 8740 with a minimum grade of S
Term Offered: Spring

OCCT 8760 OT Fieldwork & Professional Development VI
[1 credit hour]
Students complete a comprehensive proposal for the Doctoral Capstone. Includes the development of overall goals; rationales for site and mentor selection; measurable objectives; learning methods to be accomplished; and criteria for student evaluation.
Term Offered: Summer

OCCT 8800 Independent Study OT
[0-12 credit hours]
Intensive study in a field of interest, including theoretical and experimental work. May be repeated for credit. Prerequisite: Admission to OTD program or consent of instructor Fall, Spring, Summer
Term Offered: Summer, Fall

OCCT 8900 Mentored Capstone Dissemination
[3 credit hours]
Focuses on individualized issues arising in the Capstone Practicum. Involves mentorship by site and faculty practitioners and culminates in a paper and a presentation dealing with a specific area within occupational therapy. Spring Prerequisite: Level II fieldwork and completion of academic content except research, which may be taken concurrently Co-requisites: Mentored Studies in Capstone Area or approved elective and Capstone Practicum
Term Offered: Spring

OCCT 8910 Mentored Studies:Capstone Area
[3 credit hours]
Focuses on mastery of literature and in-depth knowledge of an area within occupational therapy through exploration of library, electronic, and clinical resources. Lends theoretical and research support to the Capstone Practicum. Spring Prerequisite: Level II fieldwork and completion of academic content except research, which may be taken concurrently Co-requisites: Mentored Capstone Dissemination and Capstone Fieldwork Practicum
Term Offered: Spring

OCCT 9810 OT Fieldwork: Level II A
[3 credit hours]
Provides a 12 - week, full-time, supervised fieldwork experience where students refine entry-level abilities to integrate occupational therapy theory, research, and practice under supervision and with collaboration of the academic institution. An on-line forum for discussion of Level II fieldwork experiences is provided.
Prerequisites: OCCT 8750 with a minimum grade of S
Term Offered: Spring, Summer, Fall

OCCT 9820 OT Fieldwork: Level II B
[6 credit hours]
Provides a second 12 - week, full-time, supervised fieldwork experience where students refine entry-level abilities to integrate occupational therapy theory, research, and practice under supervision and with collaboration of the academic institution. An on-line forum for discussion of Level II fieldwork experiences is provided.
Term Offered: Spring, Summer, Fall

OCCT 9900 Occupational Therapy Doctorate Capstone
[10 credit hours]
Student develop skills aligned with the individualized objectives in their approved captone proposal with mentorship by faculty and on-site practitioners.
Prerequisites: OCCT 9820 with a minimum grade of S
Term Offered: Spring, Summer, Fall

PHYT 5000 Gross Anatomy
[5 credit hours]
Students will study the structure of the human body using the structure-function relationship as the course paradigm. Musculoskeletal, vascular, and peripheral nervous system anatomy will be emphasized, as will the coordinated role of these structures, both locally and regionally, in producing movement of the axial skeleton and extremities. Competencies serve as a foundation for clinical science coursework, particularly in the musculoskeletal and neuromuscular areas of practice.
Term Offered: Summer

PHYT 5020 Lifespan I
[2 credit hours]
The first of two, this course examines typical lifespan development from birth to adolescence. Emphasis is on theoretical constructs, gross motor development, physical therapy examination, diagnosis, prognosis and evaluation of findings. Also includes an overview of fine motor development, cognitive development, reflex development, interaction with families, public laws and child abuse.
Term Offered: Summer

PHYT 5050 Analysis of Movement I
[2 credit hours]
This is the first of two courses that will integrate anatomy and biomechanics in order to gain an understanding of normal and abnormal human movement. In this course, foundational concepts will be introduced including biomechanical principles and tissue and muscle mechanics and applied to understanding movement of the upper extremity joints.
Term Offered: Summer

PHYT 5060 Analysis of Movement II
[3 credit hours]
This is the second of two courses that will integrate anatomy and biomechanics in order to gain an understanding of normal and abnormal human movement. In this course biomechanical principles of human movement will be reviewed and applied to understanding movement of the spine, pelvis, and lower extremity joints. Concepts of human movement analysis will be introduced and applied to common functional movements such as standing, transferring, walking, stair negotiation, and running.
Prerequisites: PHYT 5000 with a minimum grade of C and PHYT 5050 with a minimum grade of C and PHYT 5350 with a minimum grade of C
Term Offered: Fall

PHYT 5090 Neuroscience
[5 credit hours]
An introduction to the nervous system, including fundamental concepts in neuroanatomy and neurophysiology as they relate to human movement and basic bodily function mediated by the central and peripheral nervous systems. Emphasis is placed on the effects of neurological conditions (disease, injury, mental illness) relevant to physical therapy and functional performance. Basic clinical assessment skills of neurological impairments will integrate neuroscience information with clinical practice.
Term Offered: Spring

PHYT 5110 Clinical Pathophysiology I
[3 credit hours]
Integrated study of physiological and pathophysiological processes that influence the human body at the cellular, organ and systemic levels. Emphasis on mechanisms of and clinical manifestations of common diseases with discussion of potential impact on the delivery of PT services. Content to serve as the basis for discussion of pharmacology in subsequent courses.
Term Offered: Fall

PHYT 5120 Clinical Pathophysiology II
[1 credit hour]
Second of 2 courses that address the integrated study of normal physiological and pathophysiological processes in human body at cellular, organ, and systemic levels - emphases on clinical manifestations and impact on PT plan of care.
Term Offered: Summer

PHYT 5130 Evidence Informed Practice
[4 credit hours]
Introduction to the principles of measurement and research design, with an emphasis on critically evaluating the design of research studies relevant to clinical practice.
Term Offered: Fall

PHYT 5270 Applied Exercise Physiology
[3 credit hours]
Exploration of exercise physiology principles as related to promotion of PT patients/clients' health and wellness. Emphasizes physiological and biochemical changes with exercise/training and exercise testing and prescription for PT patients/clients.
Term Offered: Spring

PHYT 5280 Therapeutic Interventions I
[2 credit hours]
The theory and practice of physical therapy in the acute care setting as it relates to improvement of functional mobility, prevention of complications, and preparation for next level of care.
Term Offered: Spring

PHYT 5290 Therapeutic Interventions II
[2 credit hours]
Study of the theoretical basis for, and the application of thermal, mechanical, and electrical modalities used for the PT management of clients. Emphasis is on evidence-based practice, critical thinking, and clinical decision-making using a case-based format, and review of the scientific literature will be used in determining the most appropriate use of modalities within a comprehensive PT plan of care.
Term Offered: Summer

PHYT 5300 Principles of Therapeutic Exercise
[2 credit hours]
Application of scientific principles in anatomy, applied biomechanics, and exercise physiology to develop sound therapeutic exercise procedures. Emphasis on development of skills associated with therapeutic exercise for patients with musculoskeletal and/or general movement dysfunction. Students will learn how to use and apply a variety of common fitness and rehabilitation exercise apparatus and develop appropriate PT treatment plans that include exercise for a given patient problem.
Term Offered: Spring

PHYT 5350 Introduction to Examination
[2 credit hours]
Introduction to the physical examination process, including history-taking, systems review and screening. Emphasis on basic PT examination skills of the cardiovascular, musculoskeletal, and integumentary systems. Skills include: assessment of tolerance to functional activity (vital signs), posture, pain, peripheral pulses and edema; goniometry; and strength testing.
Term Offered: Summer

PHYT 5450 Foundations of Physical Therapy
[2 credit hours]
Addresses the professional socialization process. Professional codes and guides of behavior will be discussed in relation to delivery of competent, ethical, legal and compassionate PT services. Topics include: therapeutic communication, cultural competency, stress management and conflict resolution. Introduction to basic principles of teaching and learning for the role of educator is included.
Term Offered: Fall

PHYT 5650 Pharmacology of Physical Therapy
[1 credit hour]
Integrated study of pharmacology that presents the pharmacodynamics and pharmacotherapeutics of common classes of drugs. Drugs covered include: anti-inflammatory, analgesic, muscle relaxant, psychotropic, anti-microbial, and diabetic medications. Emphasis on indications, contraindications, adverse drug reactions, and the implications for physical therapy care.
Term Offered: Summer

PHYT 5750 Clinical Reasoning
[1 credit hour]
Introduction to theoretical models that guide clinical decision making, including patient management, clinical reasoning, disablement, and evidence-based practice models. Documentation will be discussed as a tool to aid clinical reasoning.
Term Offered: Spring

PHYT 5850 Clinical Education Experience I
[3 credit hours]
The first in a series four full-time, supervised clinical education experiences. Students are engaged in supervised practice in a 6-week integrated clinical education experience that emphasizes the early phases of development toward entry-level PT competencies in professional practice and patient management in either an inpatient or outpatient practice setting.
Term Offered: Summer

PHYT 5900 Medical Imaging
[2 credit hours]
This course provides the student with the tools needed to interpret information obtained from the radiology report and apply it to management of the physical therapy patient. Musculoskeletal imaging is emphasized, but imaging for other body systems is also addressed. This course strengthens the student's competency to perform a comprehensive patient evaluation, establish a diagnosis and prognosis, develop a physical therapy plan of care, and to communicate and collaborate with other health care providers.
Term Offered: Spring

PHYT 6020 Lifespan II
[2 credit hours]
The principles of normal aging including the physiological, functional, and psychosocial changes associated with aging, and a review of diseases and disorders common to the aging population.
Term Offered: Fall

PHYT 6100 Health Promotion
[2 credit hours]
Discussion and application of the elements of health and wellness as described by Healthy People 2020. Emphasis on health assessment, obesity, physical activity, nutrition, complementary/alternative management, and behavior modification strategies.
Term Offered: Spring

PHYT 6170 Scholarly Project I
[2 credit hours]
This course is intended to examine a physical therapy relevant question in a systematic and scholarly manner.
Term Offered: Summer

PHYT 6180 Scholarly Project II
[2 credit hours]
This course is intended to explore physical therapy practice with the aim of creating new knowledge in a systematic and scholarly manner.
Term Offered: Spring

PHYT 6260 Cardiovascular-Pulmonary Physical Therapy
[3 credit hours]
Integrative study of the role of PT in interdisciplinary management of patients with cardiovascular and/or pulmonary dysfunction. Application of skills associated with PT examination, evaluation, diagnosis, prognosis and interventions for patients with CV-P dysfunction.
Term Offered: Fall

PHYT 6460 Education in Healthcare
[2 credit hours]
Study of a physical therapist's role as educator of peers, patients and families, community members, and students in the clinical setting. Emphasis on instructional design, instructional strategies, teaching methods, and evaluation of learning.
Term Offered: Fall

PHYT 6500 Musculoskeletal Rehab I
[3 credit hours]
First of two courses, focused on the synthesis of principles of pathophysiology and screening and examination of musculoskeletal system. Emphasis on pertinent special examination techniques, principles of evaluation, PT diagnosis and prognosis, and intervention for the upper and lower extremities. Case-based discussion of role of common M-S pharmacological management, radiographic procedures and findings, and interpretation of special tests for diagnostic purposes.
Term Offered: Fall

PHYT 6510 Musculoskeletal Rehab II
[3 credit hours]
Second of two courses, continued discussion of the principles of pathophysiology and musculoskeletal examination, evaluation, PT diagnosis and prognosis, and intervention. Emphasis on spine and lower quarter biomechanical examination and evaluation as it relates to lumbopelvic dysfunction. Includes discussion of: pharmacological management of inflammation and pain, and synthesis of radiological findings (radiographs, MRI, CT scans), as they relate to rendering PT diagnosis and prognosis.
Term Offered: Spring

PHYT 6600 Neuromuscular Rehab I
[3 credit hours]
The first of two courses that will integrate evidence-based rehabilitation concepts into the management of patients with common neuromuscular diseases. Contemporary theories of neurological rehabilitation, motor control, and motor learning are integrated with therapeutic exercise to address common impairments in clients. Examination, evaluation, plan of care development, and interventions for clients with cerebrovascular accident (stroke), spinal cord injury, and traumatic brain injury are emphasized.
Term Offered: Fall

PHYT 6610 Neuromuscular Rehab II
[3 credit hours]
Second course in the series on rehabilitation of patients with neuromuscular diagnoses, including amputations, and neurodegenerative diseases. Emphasis on theories, philosophies, and the PT plan of care including examination, evaluation, and intervention strategies. Prostheses and orthoses prescription, application and training included.
Term Offered: Spring

PHYT 6620 Pediatric Rehabilitation
[2 credit hours]
Principles of rehabilitation for pediatric clients with neuromuscular impairments and developmental disabilities. Preparation for physical therapy practice in pediatric settings using interdisciplinary family-centered practice; normal and abnormal development, standardized assessment, service-delivery settings, interventions, management strategies specific to pediatrics. Emphasis on essential pediatric core competencies and the PT Management including examination, evaluation, diagnosis/prognosis, and intervention strategies.
Term Offered: Spring

PHYT 6700 Professional Issues
[1 credit hour]
Discussion of current events and issues faced by the profession of physical therapy as identified by the APTA and other pertinent sources, and as encountered during clinical education experiences.
Term Offered: Summer

PHYT 6720 Special Topics in Physical Therapy I
[2 credit hours]
Intensive exploration of a topic related to physical therapy service delivery in advanced practice. The content of this course serves to deepen the student's study of clinical management in select topics.
Term Offered: Spring, Summer

PHYT 6730 Special Topics in Physical Therapy II
[2 credit hours]
Intensive exploration of topics related to physical therapy service delivery in advanced practice. The course is designed to meet the student's special interests and professional goals. The content of this course serves to deepen the student's study of clinical management in select topics
Term Offered: Spring

PHYT 6740 Clinical Seminar I
[2 credit hours]
The first of a series of two courses, this course emphasizes the application of clinical psychomotor skills, problem-solving and critical thinking for a variety of diagnoses and practice settings using patient scenarios including patients with movement dysfunction involving multiple body systems. An emphasis is placed on evidence-based decision-making, comprehensive evaluation, progressive intervention planning, and evaluation of one's own clinical reasoning processes and skills.
Term Offered: Fall

PHYT 6750 Clinical Seminar II
[2 credit hours]
The second of a series of two courses, this course emphasizes the application of clinical psychomotor skills, problem-solving and critical thinking for a variety of diagnoses and practice settings using patient scenarios including patients with movement dysfunction involving multiple body systems. An emphasis is placed on evidence-based decision-making, comprehensive evaluation, progressive intervention planning, and evaluation of one's own clinical reasoning processes and skills.
Term Offered: Spring

PHYT 6850 Clinical Education Experience II
[5 credit hours]
The second in a series of four full-time, supervised clinical education experiences. Students are engaged in supervised practice in a 10 week clinical education experience that emphasizes development toward entry-level PT competencies in professional practice and patient management in an inpatient or outpatient practice setting.
Term Offered: Summer

PHYT 7050 Practice Management
[2 credit hours]
Examination of management and supervisory issues encountered in contemporary physical therapy practice. Discussion will include identification, analysis, and resolution of issues that compromise the delivery of effective and efficient PT services in a variety of practice settings. Topics include: organizational structure and behavior, human resources, finance and operations management, and marketing.
Term Offered: Fall

PHYT 7320 Medical Screening
[1 credit hour]
Preparation to work within a collaborative medical model and application of threshold detection to recognize and identify impairments or "red flags" in medical screening that warrant contact with a physician or other health care provider. Patient cases illustrate important medical screening principles. Emphasis on an examination scheme to promote efficient, effective patient data collection and professional communication with patients, physicians and other health providers.
Term Offered: Summer

PHYT 7890 Clinical Education Experience III
[4 credit hours]
The third in a series of four full-time, supervised clinical education experiences. Students are engaged in supervised practice in a 8-week terminal clinical education experience that emphasizes development toward entry-level PT competencies in professional practice and patient management in an inpatient or outpatient practice setting.
Term Offered: Summer

PHYT 7900 Clinical Education Experience IV
[6 credit hours]
The fourth in a series of four full-time, supervised clinical education experiences. Students are engaged in supervised practice in a 12 week terminal clinical education experience that emphasizes development of entry-level PT competencies in professional practice and patient management in an inpatient, outpatient or specialized practice setting.
Term Offered: Spring, Fall

RCRT 5040 Recreational Therapy Services within the Veterans Administration
[3 credit hours]
The course will focus on current trends, issues, and clinical techniques specific to serving Veterans within the Veteran's Administration VA system as a Recreational Therapist. Course content will include orientation to military culture and rituals, specific diagnoses, and conditions commonly experienced by Veterans, delivery of outcome-based RT interventions and special programs, partnerships, and an in-depth look into internships and employment opportunities within the VA system.
Term Offered: Spring, Fall

RCRT 5300 Inclusion and Recreational Therapy Services
[3 credit hours]
An introductory course which defines the principals of inclusion and major legislation that impacts the provision and delivery of recreational therapy services for individuals with disabilities. Thirty hour volunteer component required. Minimum "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5310 Leisure And Popular Culture
[3 credit hours]
This course provides the graduate student with an advanced understanding of leisure theory, philosophy, and behavior and its application to the delivery of leisure services within contemporary culture.
Term Offered: Summer, Fall

RCRT 5320 Administration In Recreational Therapy
[3 credit hours]
This course focuses on the administrative functions of delivering Recreational Therapy services. Students will gain an understanding of the aspects of management principles including ethics, legislation, technology, quality management, risk management, financial and human resources, marketing, and accrediting agencies. Minimum "C" required for RCRT majors. Note: Senior Standing and Acceptance in the Recreational Therapy program.
Term Offered: Spring, Fall

RCRT 5330 Administration in Recreation Services
[3 credit hours]
This course focuses on the administrative functions of Recreation and Recreation-Related services. Students will gain an understanding of the aspects of management principles including theoretical foundations, program and administrative planning, evaluation, maintenance, facility management, budgeting, human resources, and professional development.
Term Offered: Spring

RCRT 5340 Leisure, Recreation, And Aging in Recreational Therapy Practice
[3 credit hours]
This course provides a study of the impacts of aging on leisure and recreation activities during middle and later adulthood by investigating the aging process, leisure across the lifespan, and the impact of leisure and recreation on quality of life and wellness from an RT perspective. Minimum grade of "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5410 Facility Planning and Design
[3 credit hours]
This course provides the graduate student with an advanced understanding of, and ability to apply, the principles of design and the site design process to the development of recreation-based facilities. Specific areas of the design process presented include: tools of the trade, functional and aesthetic considerations, research, regional and site analysis, programming, final design development, construction, management, and evaluation.
Term Offered: Spring

RCRT 5420 Research Applications in Recreation & Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding of, and ability to apply, the basic components of research in the academic and professional practice setting including: ethics, human subject protection, research concepts, topic identification, theoretical roots, literature review development, sample selection, methodologies, instrument testing, data collection and analysis procedures, and research reporting.
Term Offered: Fall

RCRT 5560 Recreational Therapy Interventions 1
[3 credit hours]
This course provides the student the fundamental skill development needed to implement therapeutic outcomes using Recreational Therapy interventions utilizing leisure education, assistive technology, and animal assisted therapy within treatment settings. Minimum "C" required for RCRT majors. Registration restriction: Acceptance into the Recreation and Leisure master's program.
Term Offered: Fall

RCRT 5565 Recreational Therapy Interventions 2
[3 credit hours]
This course provides the student the fundamental skill development needed to implement therapeutic outcomes using Recreational Therapy interventions utilizing therapeutic art, horticulture, and stress management/relaxation therapy within treatment settings. Minimum "C" required for RCRT majors.
Term Offered: Spring

RCRT 5570 Recreational Therapy Interventions 3
[2 credit hours]
This course provides the student the fundamental skill development needed to implement therapeutic outcomes using Recreational Therapy interventions utilizing therapeutic fitness and aquatic therapy within treatment settings. Minimum "C" required for RCRT majors.
Term Offered: Fall

RCRT 5710 Outdoor and Adaptive Sports Program Delivery in Recreational Therapy Practice
[3 credit hours]
An introduction to theory and techniques related to risk management, leadership, and administration of outdoor pursuits in RT practice as it applies to working with individuals in clinical and non-clinical settings. Students will also gain an understanding of adapted sports, modification of equipment, adapted sports competition for persons with disabilities and the classification system governing adapted sports competition for veterans. Minimum "C" required for RCRT majors. Prerequisite: Senior Standing and Acceptance in the Recreational Therapy program.
Term Offered: Spring, Fall

RCRT 5720 Introduction To Therapeutic Recreation
[3 credit hours]
This course is designed to introduce the student to theories, models, principles, and history of therapeutic recreation service. Through lectures, discussions and self-directed learning activities, the student will examine the structure and function of therapeutic recreation processes in a variety of treatment settings. Minimum "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5730 Physical and Neurological Diagnosis and Conditions in Recreational Therapy Practice
[3 credit hours]
This course is designed to provide the student with in-depth knowledge of the diagnostic criteria, etiology, and symptomology related to physical, neurological, sensory, and metabolic diagnosis and conditions across the lifespan with a focus on RT practice. RT interventions, pharmacological interventions, family involvement, risk management, and other implications impacting RT practice will also be examined.
Term Offered: Fall

RCRT 5750 Group Dynamics In Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding, and ability to apply, concepts and theories of the therapeutic group process as applicable to professional practice. Students will be introduced to and practice: facilitation skills, behavior modification techniques, and effective communication and leadership skills.
Term Offered: Spring, Fall

RCRT 5760 APIE in Recreation Therapy
[3 credit hours]
This course addresses the procedures and processes of assessment, planning, implementation and evaluation of recreation therapy services.

RCRT 5790 Psychological Diagnosis and Conditions in Recreational Therapy Practice
[3 credit hours]
This course is designed to provide the student with in-depth knowledge of the diagnostic criteria, etiology, and symptomology related to psychological conditions across the lifespan with a focus on RT practice. RT interventions, pharmacological interventions, family involvement, risk management, and other implications impacting RT practice will be examined.
Term Offered: Spring

RCRT 5800 Clinical: Physical Rehabilitation
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the APIE(D) process with a physical rehabilitation population.
Term Offered: Spring, Summer, Fall

RCRT 5810 Recreational Therapy Fieldwork 1
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the Recreational Therapy APIE(D) process with a population served by a CTRS.
Term Offered: Fall

RCRT 5820 Recreational Therapy Fieldwork 2
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the APIE(D) process with a clinical population. Minimum "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5830 Recreational Therapy Fieldwork III
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the APIE(D) process with a geriatric population.
Term Offered: Spring

RCRT 5840 Recreational Therapy Fieldwork 4
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the Recreational Therapy APIE(D) process with a population served by a CTRS. Minimum "C" required for RCRT majors. Registration restriction: Acceptance into the master of arts in recreation and leisure.
Term Offered: Spring

RCRT 5870 Program Planning In Recreational Therapy
[3 credit hours]
This course requires the graduate student to apply cumulative knowledge of the APIE(D) process through designing evidence-based: treatment programs, program evaluations, protocols and treatment plans in recreation therapy practice.
Term Offered: Spring

RCRT 5930 Internship Competency in Recreational Therapy
[1 credit hour]
This course is designed to prepare graduate students for the Recreational Therapy Internship process and professional employment in recreational therapy. Students will demonstrate academic and professional competence to ensure readiness for successful completion of a Recreational Therapy Internship. Student internship expectations and professional certifications and licensure are also addressed.
Term Offered: Spring

RCRT 5940 Internship In Recreation And Leisure
[1-6 credit hours]
This course provides the graduate student with the opportunity to complete an internship under the supervision of a recreation professional in partial fulfillment for the MA degree in recreation and leisure studies.
Term Offered: Spring, Summer, Fall

RCRT 6000 Issues And Trends In Recreation/Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding of the issues and trends impacting the delivery of recreation and recreation therapy services in diverse professional settings.
Term Offered: Spring

RCRT 6020 Financial Resources Of Recreation And Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding of the finincial management concepts and resources supporting the delivery of recreation and recreation therapy services.
Term Offered: Summer, Fall

RCRT 6100 Recreation I: Leisure and Society
[4 credit hours]
This course thoroughly examines and provides understanding of the recreation and leisure services profession in relation to the historical, philosophical, behavioral, cultural, social, and economical contributions of the profession to the provision of recreation and leisure services.
Term Offered: Fall

RCRT 6110 Recreation II: Leadership
[4 credit hours]
This course thoroughly examines and provides understanding of the major components of leadership in relation to human development, cultural adaptability, communication, group dynamics, influencing behavior, conflict resolution, ethics, managing risk and effective leadership in the provision of recreation and leisure services.
Term Offered: Fall

RCRT 6120 Recreation III: Facility Design
[4 credit hours]
This course thoroughly examines and provides understanding of the processes included in designing recreation and recreation-related facilities including the history of development of the recreation facility infrastructure in the United States, tools of the trade, principles of design, functional and aesthetic considerations, research, regional and site analysis, universal design and accessibility, construction management, evaluation, and final design development.
Term Offered: Fall

RCRT 6130 Recreation IV: Liability & Risk
[4 credit hours]
This course thoroughly examines and provides understanding of risk management, legal liability, negligence, emergency action plan development, risk management plan development, and addressing and reducing risk in the provision of recreation and leisure services.
Term Offered: Spring

RCRT 6140 Recreation V: Financial Resources
[4 credit hours]
This course thoroughly examines and provides understanding of the foundations of fiscal management as it relates to fiscal planning; fiscal acquisition; sources of funding; resource allocation; budgeting; the management of assets, liabilities, equities, revenues, expenses and profits; and developing and understanding fiscal documents in the provision of recreation and leisure services.
Term Offered: Spring

RCRT 6150 Recreation VI: Administration
[4 credit hours]
This course thoroughly examines and provides understanding of management theory and practice, organization and structure, ethics, planning, decision making and problem solving, human and fiscal resources, marketing, legal issues, and evaluation in the provision of recreation and leisure services.
Term Offered: Spring

RCRT 6160 Recreation VII: Evaluation
[3 credit hours]
This course thoroughly examines and provides understanding of the common methodologies used in conducting recreation-related research and evaluation including the research process, research ethics, research methodologies, instrument development and testing, data collection and analysis, data interpretation and reporting as it relates to the provision of recreation and leisure services.
Term Offered: Summer

RCRT 6940 Recreation VIII: Internship
[3 credit hours]
This course provides the graduate student with the opportunity to complete an internship under the supervision of a recreation professional in partial fulfillment for the MA degree in recreation and leisure studies.
Term Offered: Spring, Summer, Fall

RCRT 6990 Independent Study In Recreation And Leisure
[1-3 credit hours]
This course provides the graduate student with the opportunity to develop an advanced independent learning experience in support of academic and/or professional interests.
Term Offered: Spring, Summer, Fall

SLP 6000 Advanced Practicum In Communication Disorders
[2 credit hours]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected.
Term Offered: Spring, Summer, Fall

SLP 6001 Advanced Practicum in Communication Disorders II
[2 credit hours]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected. SLP 6000 is a pre-requisite for this course.
Prerequisites: SLP 6000 with a minimum grade of D-
Term Offered: Spring

SLP 6002 Advanced Practicum III
[2 credit hours]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected. SLP 6000 and 6001 are a pre-requisite for this course.
Prerequisites: SLP 6000 with a minimum grade of D- and SLP 6001 with a minimum grade of D-
Term Offered: Summer

SLP 6010 Diagnostic Practicum In Communication Disorders
[2 credit hours]
Provides a minimum of 30 hours supervised diagnostic practicum with a variety of communicatively disordered cases.
Term Offered: Spring, Fall

SLP 6011 Diagnostic Practicum in Communication Disorders II
[2 credit hours]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected.
Prerequisites: SLP 6010 with a minimum grade of D-
Term Offered: Summer

SLP 6040 Exploring Research in Speech Language Pathology
[2 credit hours]
This course will guide graduate students in an exploration of the methods and process of research in Speech and Language Pathology. In addition, the students will be guided in the process of critically reviewing research pertinent to the field. The course will culminate in the development of an independent research project or paper, that will lead to their comprehensive exam/project required for graduation.
Term Offered: Spring, Fall

SLP 6100 Diagnosis Of Speech And Language Disorders
[3 credit hours]
Detailed analysis of formal and informal instruments and procedures designed to evaluate speech and language disorders.
Term Offered: Spring, Summer, Fall

SLP 6210 Language Development and Disorders: Early Childhood
[3 credit hours]
This course provides the conceptual framework for understanding language disorders in preschool children. Special emphasis is placed on application and theory of assessment as well as intervention strategies in for early intervention, school, and private settings.
Term Offered: Spring, Fall

SLP 6220 Language Disorders In School-Age Children
[3 credit hours]
The conceptual framework for understanding language disorders in school-age children with special emphasis on language assessment and language interventions in school settings.
Term Offered: Spring, Fall

SLP 6300 Phonological And Articulatory Disorders
[3 credit hours]
Advanced study of phonological and articulatory disorders including developmental apraxia. Focus on phonological differences in multi-cultural society with emphasis on assessment of disorders and current advances in remediation.
Term Offered: Spring, Summer, Fall

SLP 6400 Adult Language and Cognitive Communication Disorders
[5 credit hours]
Advanced course exploring normal and disordered neural anatomy and physiology for communication and cognition. Student will demonstrate knowledge of assessment and treatment of cognitive and linguistics deficits due to trauma and disease to central nervous systems.
Term Offered: Spring, Fall

SLP 6500 Motor Speech Disorders
[3 credit hours]
Adult apraxia and dysarthrias are discussed in relation to neurological organization, disorders and speech characteristics.
Term Offered: Spring, Fall

SLP 6550 Trends in Technology for Communication Disorders
[3 credit hours]
Introduction to the study and application of assistive technology, including augumentative and alternative communication devices, to aid communication for persons incapable of producing functional oral communication. The course includes device characteristics, program features, and intervention strategies as well as current trends in technological advances that includes but are not limited to devices such as iPads, smartphone applications, and software.
Term Offered: Spring, Summer, Fall

SLP 6600 Voice and Resonance Disorders
[3 credit hours]
An advanced course in the nature, evaluation and treatment of voice and resonance disorders. Major voice and resonance disorders in adults and children are emphasized.
Term Offered: Summer

SLP 6650 Feeding and Swallowing Disorders
[3 credit hours]
This course introduces the student to the nature, evaluation, and management of feeding and swallowing disorders from infancy through adulthood.
Term Offered: Spring, Summer, Fall

SLP 6700 Assessment And Remediation Of Fluency Disorders
[3 credit hours]
An advanced course to develop skills in the assessment and remediation of fluency disorders with special emphasis on current trends in stuttering therapy.
Term Offered: Spring, Summer, Fall

SLP 6750 Professional Issues in Speech Language Pathology
[2 credit hours]
This course will provide students with the opportunity to learn about specific issues related to working in a variety of professional settings.
Term Offered: Spring, Fall

SLP 6800 Aural Rehabilitation
[3 credit hours]
Aural (Re)Habilitation examines communication assessment and intervention approaches over the lifespan for individuals with both peripheral and central auditory perceptual issues. Emphasis is placed upon early identification and education to minimize and alleviate communication and related problems commonly associated with hearing impairment and auditory perceptual disorders.
Term Offered: Spring, Summer, Fall

SLP 6920 SLP Concomitant Project
[1 credit hour]
Students present an evidenced based project that demonstrates comprehensive understanding of all they learned during the graduate program through the application of critical thinking skills.
Prerequisites: SLP 6040 with a minimum grade of B
Term Offered: Spring, Fall

SLP 6940 Adult Internship In Speech-Language Pathology
[6 credit hours]
Provides the advanced graduate student with supervised practicum experiences with the adult population at an off-campus site; including hospitals, agencies, rehabilitation clinics, work training sites and other community sites where persons with disabilities are served.
Term Offered: Spring, Summer, Fall

SLP 6941 Pediatric Internship in Speech-Language Pathology
[6 credit hours]
Provides the advanced graduate student with supervised practicum experiences with the pediatric population at an off-campus site; including schools, hospitals, agencies, rehabilitation clinics, and other community sites where persons with disabilities are served.
Term Offered: Spring, Summer, Fall

SLP 6960 Master Research Thesis In Speech-Language Pathology
[1-5 credit hours]
The master's thesis is an individually designed investigation approved by the thesis committee and designed to contribute to the knowledge base of the speech-language pathology. Meets the final activity requirement for completion of the master's degree.
Term Offered: Spring, Summer, Fall

SLP 6990 Independent Study In Speech-Language Pathology
[1-5 credit hours]
Provides students the opportunity to work independently on professional problems under the direction of a faculty member in the Department of Speech Language Pathology.
Term Offered: Spring, Summer, Fall

SLP 6995 Independent Studies in Clinical Practicum
[2 credit hours]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected.
Term Offered: Spring, Summer, Fall

MA in Recreation and Leisure Studies

Recreation Administration

The recreation and leisure studies (RLS) program offers advanced study beyond the baccalaureate level in recreation and leisure studies with emphasis in recreation administration or recreational therapy. The graduate degree offers students the ability to focus on areas of interest while obtaining skills beyond the entry level. Advanced coursework challenges the student to investigate personal philosophies as they relate to the delivery of recreation, sport and leisure services.

Students enrolling in the master of arts in recreation and leisure must meet the following minimum admission requirements:

- A bachelor's or professional degree earned from a department of approved standing and granted by an accredited college or university.
- A 2.70 or equivalent Grade Point Average (GPA) for all previous undergraduate academic work.
- Prerequisite academic work that indicates the applicant should be able to pursue effectively the master of arts in recreation and leisure studies.
- Proof of health and accident insurance.
- Satisfactory scores on the Test of English as a Foreign Language (TOEFL) if from a country where English is not the primary language.
- Provisional acceptance to the program may be considered for applicants not meeting the requirements for regular student status admission.

Course Requirements

Code	Title	Hours
Recreation Administration Track (30 Credit Hours)		
RCRT 6100	Recreation I: Leisure and Society	4
RCRT 6110	Recreation II: Leadership	4
RCRT 6120	Recreation III: Facility Design	4
RCRT 6130	Recreation IV: Liability & Risk	4
RCRT 6140	Recreation V: Financial Resources	4
RCRT 6150	Recreation VI: Administration	4
RCRT 6160	Recreation VII: Evaluation	3
RCRT 6940	Recreation VIII: Internship	3
Total Hours		**30**

Code	Title	Hours
Recreation Therapy Track (44 Credit Hours)		
RCRT 5300	Inclusion and Recreational Therapy Services	3
RCRT 5320	Administration In Recreational Therapy	3
RCRT 5565	Recreational Therapy Interventions 2	3
RCRT 5570	Recreational Therapy Interventions 3	2
RCRT 5710	Outdoor and Adaptive Sports Program Delivery in Recreational Therapy Practice	3
RCRT 5720	Introduction To Recreational Therapy	3
RCRT 5730	Physical and Neurological Diagnosis and Conditions in Recreational Therapy Practice	3
RCRT 5760	APIE in Recreation Therapy	3
RCRT 5790	Psychological Diagnosis and Conditions in Recreational Therapy Practice	3
RCRT 5810	Recreational Therapy Fieldwork 1	1
RCRT 5820	Recreational Therapy Fieldwork 2	1
RCRT 5830	Recreational Therapy Fieldwork III	1
RCRT 5930	Internship Competency in Recreational Therapy	1
RCRT 6110	Recreation II: Leadership	4
RCRT 6130	Recreation IV: Liability & Risk	4
RCRT 6160	Recreation VII: Evaluation	3
RCRT 6940	Recreation VIII: Internship	3
Total Hours		**44**

For the degree in recreation administration, immunizations, background checks, and a "fit for duty" test may be required by host agencies for internships. Students must provide their own transportation to internship sites.

Students in the recreation therapy program must provide verification of immunizations:

- Mantoux,
- Rubella Titer/Roseolla (MMR),
- Hepatitis B status, as well as
- current CPR certification.

Additional immunizations may be required by host agencies for clinicals or internships. Host agencies may also require background checks and/or "fit for duty" tests. Students must provide their own transportation to

volunteer, clinical or internship sites. More information can be found at: http://www.utoledo.edu/hhs/rec-admin/

Summary of Recreation and Leisure Studies Technical Standards

Students completing the master's degree in recreation and leisure studies must possess/demonstrate the competencies needed for the provision of recreation and/or recreation therapy services at the administrative level. Students must understand the context of recreation services in contemporary society, be able to identify and adapt to the issues and trends effecting the recreation profession and the communities in which services are provided, demonstrate the ability to be effective administrative leaders and effective fiscal resource managers, as well as demonstrate the ability to competently engage in the evaluation of programs and services. Students must also demonstrate the capacity to engage in critical thinking and effective problem solving and decision making. In addition, students must demonstrate the ability to apply the aforementioned knowledge and skills from a multicultural, inclusive, and nondiscriminatory perspective.

Recreation Administration Track Plan of Study

First Term		Hours
RCRT 6100	Recreation I: Leisure and Society	4
RCRT 6110	Recreation II: Leadership	4
RCRT 6120	Recreation III: Facility Design	4
	Hours	**12**
Second Term		
RCRT 6130	Recreation IV: Liability & Risk	4
RCRT 6140	Recreation V: Financial Resources	4
RCRT 6150	Recreation VI: Administration	4
	Hours	**12**
Third Term		
RCRT 6160	Recreation VII: Evaluation	3
RCRT 6940	Recreation VIII: Internship	3
	Hours	**6**
	Total Hours	**30**

Recreation Therapy Track Plan of Study

First Term		Hours
RCRT 5570	Recreational Therapy Interventions 3	2
RCRT 5720	Introduction To Recreational Therapy	3
RCRT 5730	Physical and Neurological Diagnosis and Conditions in Recreational Therapy Practice	3
RCRT 5760	APIE in Recreation Therapy	3
	Hours	**11**
Second Term		
RCRT 5300	Inclusion and Recreational Therapy Services	3
RCRT 5565	Recreational Therapy Interventions 2	3
RCRT 5790	Psychological Diagnosis and Conditions in Recreational Therapy Practice	3
	Hours	**9**
Third Term		
RCRT 6160	Recreation VII: Evaluation	3
	Hours	**3**
Fourth Term		
RCRT 5710	Outdoor and Adaptive Sports Program Delivery in Recreational Therapy Practice	3
RCRT 5810	Recreational Therapy Fieldwork 1	1
RCRT 5820	Recreational Therapy Fieldwork 2	1
RCRT 6110	Recreation II: Leadership	4
	Hours	**9**
Fifth Term		
RCRT 5320	Administration In Recreational Therapy	3
RCRT 5830	Recreational Therapy Fieldwork III	1
RCRT 5930	Internship Competency in Recreational Therapy	1
RCRT 6130	Recreation IV: Liability & Risk	4
	Hours	**9**
Sixth Term		
RCRT 6940	Recreation VIII: Internship	3
	Hours	**3**
	Total Hours	**44**

- During completion of the MA Recreation Leisure Studies Program the student will engage in learning activities requiring demonstration of remembering, understanding, applying, analyzing, evaluating and/or creating to develop competence in the role of recreation and leisure in contemporary society, including, but not limited to: historical and conceptual foundations; the psychological, sociological and physiological significance of play, recreation, and leisure; the significance of the technological, economic, and political effects of recreation and leisure; the organizational structure, purpose and function of various recreation and leisure services agencies; current issues and trends; and the responsibility of the leisure service profession to make available opportunities for leisure as evidenced by successful completion of RCRT 6100 Recreation I: Leisure and Society with a minimum grade of "B".
- During completion of the MA Recreation Leisure Studies Program the student will engage in learning activities requiring demonstration of remembering, understanding, applying, analyzing, evaluating and/or creating to develop competence in the role effective leadership has in the provision of recreation and recreation-related services, including, but not limited to competencies, skills, and styles; leading across the lifespan; cultural adaptability; communication; group dynamics; influencing and inspiring desired behaviors; conflict resolution and mediation; values ethics; face-to-face leadership techniques; mitigating risk; and professionalism as evidenced by successful completion of RCRT 6110 Recreation II: Leadership with a minimum grade of "B".
- During completion of the MA Recreation Leisure Studies Program the student will engage in learning activities requiring demonstration of remembering, understanding, applying, analyzing, evaluating

and/or creating to develop competence in the role facility design has in the provision of recreation and recreation-related services, including, but not limited to past and present of recreational facility development; basic design considerations; the design process; functional considerations of Design; interpreting plans; Research, regional, and site analysis stages of the site design process; evaluating facilities; client-consultant relationships; and developing a design plan as evidenced by successful completion of RCRT 6120 Recreation III: Facility Design with a minimum grade of "B".

- During completion of the MA Recreation Leisure Studies Program the student will engage in learning activities requiring demonstration of remembering, understanding, applying, analyzing, evaluating and/or creating to develop competence in the role effective risk mitigation has in the provision of recreation and recreation-related services, including, but not limited to how to manage risks; risk management and the law; risk management planning; risk management and employees; managing risks at events; managing facility risk; security and personal safety; developing an emergency action plan; and managing risk at special facilities as evidenced by successful completion of RCRT 6130 Recreation IV: Liability Risk with a minimum grade of "B".
- During completion of the MA Recreation Leisure Studies Program the student will engage in learning activities requiring demonstration of remembering, understanding, applying, analyzing, evaluating and/or creating to develop competence in the role financial resources has in the provision of recreation and recreation-related services, including, but not limited to sector and industry comparisons; functions and organization; budgeting preparation, formats and presentation: planning reports; revenue sources; pricing; revenue management; grant-seeking; philanthropy and fundraising; sponsorship; entrepreneurship; capital budgeting; business planning; and economic principles as evidenced by successful completion of RCRT 6140 Recreation V: Financial Resources with a minimum grade of "B".
- During completion of the MA Recreation Leisure Studies Program the student will engage in learning activities requiring demonstration of remembering, understanding, applying, analyzing, evaluating and/or creating to develop competence in effectively understanding the administrative process and procedures of a recreation or recreation-related agency, including, but not limited to strategic management; organizational environment; customer service; legal aspects; human resources; computer operations; financial management and budgeting; public relations; fundraising; and maintenance as evidenced by successful completion of RCRT 6150 Recreation VI: Administration with a minimum grade of "B".
- During completion of the MA Recreation Leisure Studies Program the student will engage in learning activities requiring demonstration of remembering, understanding, applying, analyzing, evaluating and/or creating to develop competence in the role evaluative research has in the provision of recreation and recreation-related services, including, but not limited to systematic inquiry; difference between evaluation and research; trilogy of evaluation and research; evaluation models; designing evaluation and research projects; political, legal, ethical, and moral issues; qualitative and quantitative data; designs and methods; data trustworthiness; sampling; measurement instrument development; descriptive-survey evaluation and research; experimental designs; mixed methods; data analysis techniques; statistical significance; and data reporting as evidenced by successful completion of RCRT 6160 Recreation VII: Evaluation with a minimum grade of "B".
- During completion of the MA Recreation Leisure Studies Program the student will engage in learning activities requiring demonstration of remembering, understanding, applying, analyzing, evaluating and/or creating to develop competence in effectively understanding the administrative process and procedures of a recreation or recreation-related agency, including, but not limited to strategic management; organizational environment; customer service; legal aspects; human resources; computer operations; financial management and budgeting; public relations; fundraising; and maintenance as evidenced by successful completion of RCRT 6940 Recreation VIII: Internship with a minimum grade of "B".

MA in Speech-Language Pathology

The graduate program provides students with the necessary coursework and clinical practicum experience to attain a master of arts in speech-language pathology that is applicable toward the Certification of Clinical Competence (CCC-SLP) by the American Speech-Language-Hearing Association (ASHA) and state licensure in the area of speech-language pathology. In addition to successful completion of the master's degree requirements, the certification and licensure processes include successful completion of the national specialty examination in speech-language pathology and a clinical fellowship (professional experience year).

The graduate program in speech-language pathology is accredited by the Council of Academic Accreditation in Audiology and Speech-Language Pathology (CAA). The speech-language pathology program is dedicated to the development of competent and caring entry-level speech-language pathologists. The program is committed to providing a broad foundation of normal bases of speech, language, and hearing and specialized coursework in the assessment and remediation of speech and language disorders. The program provides coursework and practicum experiences with a diverse population to ensure that students demonstrate knowledge and skill competencies to provide services to children and adults with communication disorders.

Undergraduate students with a degree in speech-language pathology will be considered for entry into the graduate program. Students without adequate undergraduate preparation in speech-language pathology will need to complete a series of leveling courses in the major as an undergraduate with degree (UWD). The UWD program is available at the University of Toledo.

The deadline for completed applications for enrollment in the graduate Speech-Language Pathology program is December 15 of every academic year. Applications received after December 15 may not receive full consideration.

Applications should be made directly to the Communication Sciences and Disorders Centralized Application System ((http://www.capcsd.org/csdcas-student-page/)http://www.capcsd.org/csdcas-student-page/); additionally, a supplemental application should be completed through The University of Toledo College of Graduate Studies.

NOTE: **It is the responsibility of the student to monitor his or her application status to insure that all required materials are posted by CSDCAS before the deadline date of December 15.** Students may work

with the Communication Sciences and Disorders Centralized Application System to insure that all materials are posted before the deadline, or notify the speech-language pathology program in the event that materials are lost. Similarly, students must monitor the supplemental application status to insure that all materials are posted before the deadline date of December 15. Failure to do so may result in an incomplete application that is not reviewed.

Acceptance into the ASHA accredited speech-language pathology graduate program is highly competitive. Consequently, many factors are taken into consideration when selecting an applicant for acceptance into the program. These factors include, but are not limited to:

- undergraduate preparation in the field;
- cumulative grade point average (highest consideration for ≥3.5);
- grade point in the major (highest consideration for ≥3.5);
- potential to successfully complete the graduate program;
- quality of references (require 3);
- personal essay (statement of purpose);
- oral and written language skills;
- interview (by invitation).

Each student, while enrolled in the didactic and clinical portions of the speech-language pathology curriculum, is required to complete various immunizations, titers, tests, and a physical examination each year as specified in the Student Health Form Packet in the Speech-Language Pathology Program Student Handbook. Required immunizations include Positive MMR titers, Positive Varicella titer, Positive Heb B titer, Hep B Vaccination Series, Current Tdap, 2-step Initial TB test, and 1-step Annual TB test. All speech-language students are required to complete both an Ohio BCI check and an FBI criminal background check prior to participating in any clinical experiences. Students are prohibited from engaging in laboratory activities or attending clinical facilities if this information is not on file for the current year. For details, see: http://www.utoledo.edu/hhs/speech/formsandhandbook.html

It should also be noted that some clinical education sites have additional health requirements (flu shots, drug screens, etc.). All expenses incurred in obtaining a physical, necessary laboratory tests, immunizations and additional health requirements are the responsibility of the student.

Essential Functions

The University of Toledo admits and matriculates qualified speech-language pathology students in accordance with the UT Policy of Nondiscrimination on the Basis of a Disability – The Americans with Disabilities Act, Section 504 of the Rehabilitation Act of 1973, The State of Ohio Revised Code, and other applicable statutes and regulations relating to equality of opportunity.

The Essential Functions provide information to allow a candidate to make an informed decision for application and are a guide to accommodation of students with disabilities. Academic adjustments can be made for disabilities in some instances, but a student must be able to perform the essential functions of a speech-language pathologist independently either with or without reasonable accommodation.

Many physical, behavioral and social, and cognitive and intellectual abilities are necessary for satisfactory mastery of the academic and clinical curriculum and professional responsibilities in the field of speech-language pathology. Essential physical abilities include, but are not limited to, the ability to visually and auditorily monitor patient responses and materials and to make judgments about patient health based on these perceptions. Examples of behavioral and social attributes include maintaining emotional and mental health necessary to use one's intellectual abilities, to promptly complete responsibilities, and to develop appropriate relationships with faculty, supervisors, staff, peers, clients, parents or caregivers, and other professionals. Essential cognitive and intellectual abilities include, among others, demonstrating the mental capacity to learn and assimilate professional information, including the ability to comprehend oral and written professional literature and reports; ability to write discipline-specific papers and clinical reports in Standard American English; ability to speak Standard American English intelligibly and to discriminate correct production of and model Standard American English phonemes, vocabulary, grammatical forms, and prosodic patterns.

We urge applicants to ask questions about the program's technical standards for clarification and to determine whether they can meet the requirements with or without reasonable accommodations. Such questions may be directed to the Program Director or the Academic Enrichment Center on campus.

Code	Title	Hours
SLP 6000	Advanced Practicum In Communication Disorders	2
SLP 6001	Advanced Practicum in Communication Disorders II	2
SLP 6002	Advanced Practicum III	2
SLP 6010	Diagnostic Practicum In Communication Disorders	2
SLP 6011	Diagnostic Practicum in Communication Disorders II	2
SLP 6040	Exploring Research in Speech Language Pathology	2
SLP 6100	Diagnosis Of Speech And Language Disorders	3
SLP 6210	Language Development and Disorders: Early Childhood	3
SLP 6220	Language Disorders In School-Age Children	3
SLP 6300	Phonological And Articulatory Disorders	3
SLP 6400	Adult Language and Cognitive Communication Disorders	5
SLP 6500	Motor Speech Disorders	3
SLP 6550	Trends in Technology for Communication Disorders	3
SLP 6600	Voice and Resonance Disorders	3
SLP 6650	Feeding and Swallowing Disorders	3
SLP 6700	Assessment And Remediation Of Fluency Disorders	3
SLP 6750	Professional Issues in Speech Language Pathology	2
SLP 6800	Aural Rehabilitation	3
SLP 6920	SLP Concomitant Project	1
SLP 6940	Adult Internship In Speech-Language Pathology	6

SLP 6941	Pediatric Internship in Speech-Language Pathology	6
Total Hours		**62**

First Year		**Hours**
SLP 6000	Advanced Practicum In Communication Disorders	2
SLP 6001	Advanced Practicum in Communication Disorders II	2
SLP 6002	Advanced Practicum III	2
SLP 6010	Diagnostic Practicum In Communication Disorders	2
SLP 6011	Diagnostic Practicum in Communication Disorders II	2
SLP 6040	Exploring Research in Speech Language Pathology	2
SLP 6100	Diagnosis Of Speech And Language Disorders	3
SLP 6210	Language Development and Disorders: Early Childhood	3
SLP 6220	Language Disorders In School-Age Children	3
SLP 6300	Phonological And Articulatory Disorders	3
SLP 6400	Adult Language and Cognitive Communication Disorders	5
SLP 6500	Motor Speech Disorders	3
SLP 6550	Trends in Technology for Communication Disorders	3
SLP 6600	Voice and Resonance Disorders	3
SLP 6650	Feeding and Swallowing Disorders	3
SLP 6700	Assessment And Remediation Of Fluency Disorders	3
	Hours	**44**
Second Year		
SLP 6750	Professional Issues in Speech Language Pathology	2
SLP 6800	Aural Rehabilitation	3
SLP 6920	SLP Concomitant Project	1
SLP 6940	Adult Internship In Speech-Language Pathology	6
SLP 6941	Pediatric Internship in Speech-Language Pathology	6
	Hours	**18**
	Total Hours	**62**

Students are divided into two cohort groups/tracks (Gold and Blue). While all students will graduate having the same didactic and clinical requirements, the two cohorts will go through a different sequence of courses. In addition to the academic requirements of the degree, students must enroll in graduate credits to complete multiple clinical experiences including on-campus clinical practica as well as a minimum of internships to meet clinical requirements for certification. Students may choose between a thesis and a comprehensive examination.

The following programs of study assume no deficiencies in normal bases of speech/language/audiology requirements exist.

- PLO 1. Knowledge outcomes: IV A: The applicant must have demonstrated knowledge of the biological sciences, physical sciences, statistics, and the social/behavioral sciences.
- PLO 2. Knowledge outcomes: IV B: The applicant must have demonstrated knowledge of basic human communication and swallowing processes, including the appropriate biological, neurological, acoustic, psychological, developmental, and linguistic and cultural bases. The applicant must have demonstrated the ability to integrate information pertaining to normal and abnormal human development across the life span.
- PLO 3. Knowledge outcomes: IV C: The applicant must have demonstrated knowledge of communication and swallowing disorders and differences, including the appropriate etiologies, characteristics, anatomical/physiological, acoustic, psychological, developmental, and linguistic and cultural correlates in the following areas:
- PLO 4. Skills Outcomes: V A: The applicant must have demonstrated skills in oral and written or other forms of communication sufficient for entry into professional practice.
- PLO 5. Skills Outcomes: V B: The applicant for certification must have completed a program of study that included experiences sufficient in breadth and depth to achieve the following skills outcomes:

Occupational Therapy Doctorate

Occupational therapists work in health care and education to support each individual's participation in their everyday tasks. They leverage the therapeutic value of those same tasks to promote physical, emotional, and cognitive wellness. Each state in the US licenses occupational therapists. To obtain a license, one must 1. graduate from an accredited occupational therapy education program with either a master's degree or a clinical doctorate degree (an occupational therapy doctorate–OTD) and 2. pass a national certification exam.

The program at UToledo is a doctoral program. As an OTD program, we were the first in Ohio and the first in the nation at a public institution. We believe that doctoral-level therapists advance in their careers, contribute to the progress of the field, and serve as advocates for vulnerable populations.

The UToledo OTD program is accredited by the:
Accreditation Council for Occupational Therapy Education of the American Occupational Therapy Association
7501 Wisconsin Avenue, Suite 510E
Bethesda, MD 20814
www.acoteonline.org

Graduates of the program will be eligible to sit for the national certification examination for the occupational therapist, administered by the National Board for Certification in Occupational Therapy (NBCOT). After successful completion of this exam, the graduate will be an occupational therapist, registered (OTR).

A felony conviction may affect a graduate's ability to sit for the NBCOT certification examination or attain state licensure.

Program highlights:
Our program is eight consecutive semesters (95 credits, 33 months). Our course sequence is designed to promote confidence in clinical decision making. Each of five on-campus semesters includes part time fieldwork. The final year of the program consists of two full-time, 12-week fieldwork placements and a culminating, individualized capstone project.

The OTD program is in the College of Health and Human Services, Department of Exercise and Rehabilitation Science.

Our classes are offered in a specific sequence and each only once a year. We enroll one group of about 20 students in the fall only.

Applications may be submitted after July for admission the following academic year. College juniors at participating institutions may submit their application a year ahead of time for early decision.

If you have questions, please contact us at occtherapydoctorate@utoledo.edu or 419.530.6670.

The following are required for admission:

- Bachelor's degree in any field of study with a minimum cumulative GPA of 3.0 at graduation. The bachelor's degree must be completed prior to starting the program, NOT prior to application.
- Prerequisite courses: Applicants must receive a B- or better in all prerequisite courses. Prerequisite courses must be completed prior to starting the program, NOT prior to application:
  - Introductory Biology (3 semester or 4 quarter credits), Lab required
  - Human Anatomy and Physiology (6 semester or 8 quarter credits). Lab required, however, if Anatomy and Physiology are taken as separate courses, we require a lab for Anatomy but not Physiology
  - Introduction to Psychology (3 semester or 4 quarter credits)
  - Abnormal Psychology (3 semester or 4 quarter credits)
  - Introduction to Sociology or Anthropology (3 semester or 4 quarter credits)
  - Medical Terminology (course or proficiency test)
  - Statistics (3 semester or 4 quarter credits)
  - Lifespan Human Development: You may meet this requirement by EITHER:
    - obtaining a B- or better in a Lifespan Human Development course (3 semester or 4 quarter credits) that covers human development from birth to death OR
    - obtaining a B- or better in both a Child Development (3 semester or 4 quarter credits) course **and** a Gerontology/ Psychology of Aging course (3 semester or 4 quarter credits)

Applying to the program:

- Applications are only accepted through the OT Centralized Application Service (OTCAS at https://otcas.liaisoncas.com/applicant-ux/#/login). The application includes:
  - An application fee to OTCAS
  - All academic transcripts
  - A personal statement
  - Three letters of recommendation
- Applicants to the UToledo OTD Program must also
  - Submit an additional writing sample (the essay prompt and submission are within OTCAS).
  - Complete a Prerequisite Completion Plan form (within OTCAS)
  - Pay the UToledo graduate application fee.

Transfer credits and work experience

To earn the UToledo's OTD degree, students must complete all the occupational therapy course work here. Courses taken in other occupational therapy education programs cannot be transferred. Undergraduate students seeking to transfer to UToledo to complete their bachelor's degree should visit the UToledo Adult and Transfer (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fadmission%2Ftransfer-adult-student%2F&data=05%7C01%7CAngela.Campbell%40utoledo.edu%7Cc5b3cdc5d6b240d6fe3a08db00bc81ff%7C1d6b1707baa94a3da8f8deabfb3d467b%7C0%7C0%7C638104581857190528%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLC%7C3000%7C%7C%7C&sdata=jn7BE7QupOijc68UzjL7wkbYYg9xljHrKW11SpzR6M0%3D&reserved=0) learn more. We do not award course credit for work experience.

Enrolled students will need to have a personal computing device with internet access. Information technology has provided recommended specifications on this website (https://www.utoledo.edu/it/computer-hardware-and-software/hardware-recommendations.html).

Technical Standards. The purpose of these standards is to clearly state the expected capabilities of students in the OTD program. The demands of the occupational therapy doctoral program require students to be skillful in multiple domains, including cognition, emotional regulation, communication, and gross and fine motor coordination.

Across the curriculum, the following are required to successfully complete the program:

- Communicate orally and in writing to complete individual and group assignments at the graduate level including papers, exams, presentations, projects, and demonstrations;
- Maintain interpersonal relationships with instructors, faculty, advisors, mentors, fieldwork educators, classmates, peers, and clients;
- Commit time and effort to complete independent and group work according to timelines and due dates;
- Manage and prioritize multiple concurrent demands;
- Maintain access to and use current technologies to engage with learning materials, submit work, and engage in clinical practices;
- Be punctual and attend class, practicum experiences, and fieldwork at both on- and off-campus locations, including necessary transportation and on-site mobility;
- Demonstrate a realistic understanding of the field of occupational therapy including the scope and diversity of the profession and the requirements of therapists in their day-to-day work;
- Demonstrate the willingness and ability to assume responsibilities for the full spectrum of occupational therapy services;

- Meet health requirements including specific vaccinations and screenings. (A detailed list of these requirements can be obtained from the program. It is the applicant's responsibility to inquire as to inquire as to the implications of any individual health related circumstances.).
- Respond adequately to the health and safety needs of clients/ patients, including
- Complete training in cardiopulmonary resuscitation,
- Have knowledge of Center for Disease Control standards for infectious control, and
- Respond appropriately to emergency situations in classrooms, practicum sites, and fieldwork placements;
- Submit to criminal background checks. Results may be required for fieldwork placement. Applicants/students with a criminal history may want to consult with respective licensing boards regarding their ability to obtain professional licensure.
- Maintain personal/professional records.

Potential applicants should, and enrolled students will, self-assess that their abilities align with these expectations. The faculty encourage applications from all qualified individuals regardless of race, color, national origin, religion, gender, sexual orientation, age or status as a veteran of any conflict, and disability status. We urge applicants to ask questions about the program's technical standards for clarification and to determine whether they can meet the requirements with or without reasonable accommodations. We expect that any student who requires accommodation to attain the course objectives will work with the Student Disability Services to notify the course instructor at the first opportunity. Revealing a disability is voluntary; however, such disclosure is necessary before any accommodations may be made in the learning environment or in the program's procedures. We handle disability-related information in a confidential manner. Reasonable accommodations will comply with the Americans with Disabilities Act and require program and institutional approvals.

Requirements and Criteria for Retention and Graduation. A student admitted into the OTD program must comply with rules and regulations for conduct and academic performance as stipulated by the College of Graduate Studies Health Science Campus and the College of Health and Human Services. This information can be found in the Health Science Campus Graduate Student Handbook (on the web http://www.utoledo.edu/graduate/currentstudents/references/) and the College of Health and Human Services OT Student Handbook provided at orientation.

- Graduation requires all courses of the OTD curriculum be completed to the academic standards outlined below. This includes all didactic courses, completion of the research course sequence and an individually advised scholarly project, 12 credits of full-time fieldwork arranged by the academic fieldwork coordinator, 10 credits in the capstone experience overseen by the doctoral capstone coordinator.
- A student will be placed on academic probation if her/his cumulative GPA falls below a 3.0 during any semester. If the student remains on academic probation for two consecutive semesters (including summer), the student will be dismissed.
- A student admitted under probationary status whose cumulative GPA falls below 3.0 following completion of the first 15 credits will be dismissed from the program and from the Health Science Campus College of Graduate Studies.
- A grade of C or better or a grade of S must be earned in all courses. No grade lower than a C is allowed in the total of 95 credits required for graduation. A student who receives a grade of C minus or lower or a grade of U may repeat the course one time, realizing that the sequence of study will be disrupted, and that additional time and expense will be required to complete the program. A student wishing to repeat a course will be required to apply for an academic leave until the course is re-offered in its regular sequence. However, one course within the research sequence can be repeated once without applying for academic leave with research advisor and program director approval. Both the original and repeated grades will appear on the transcript and be calculated into the cumulative GPA. Please refer to College of Graduate Studies Academic Standards (https://www.utoledo.edu/graduate/currentstudents/references/AcademicStandards.html) for further details.
- A maximum of 2 courses of C or C+ may be part of the student's Plan of Study. A student who exceeds the maximum will be subject to dismissal.
- A student who receives two or more grades of D, F or U in any one semester forfeits the opportunity to repeat and will be dismissed from the program.
- Continuous enrollment in the OTD program is required because of the sequential nature of the course work. Withdrawal from one course may require complete withdrawal from the semester and will be considered a stop-out. If a student elects to stop-out for any reason, they will be required to apply for an approved academic leave or withdraw from the program altogether. Academic leave may be effective from one to three semesters, after which time, readmission will be required.
- A student who has been dismissed from the program or who has been on academic leave for longer than one year, must apply for readmission into the OTD program. Readmission will be determined on an individual basis dependent on the reason for dismissal or the conditions requiring academic leave.
- Students are expected to comply with the requirements of fieldwork and capstone sites and the academic program in completing Level I and Level II fieldwork experiences, and the Capstone experience. Level I fieldwork will be completed during the academic portion of the program while Level II fieldwork and the Capstone experience will be completed after the academic portion of the program is completed. The student will need to complete a minimum of two Level II fieldwork placements at full-time capacity or equivalent to meet the 6-month Level II fieldwork requirement. The student will need to complete a minimum of 14 full-time weeks of at least 32 hours per week or equivalent to meet the Capstone experience requirement. Additionally, the student must complete and disseminate an individual Capstone project that relates to the Capstone experience.
- Students must complete all level II FW in 24 months following the didactic portion of the program. The capstone experience must be completed within 12 months following completion of level II FW.
- Completion of all program requirements within 7 calendar years.
- All professional occupational therapy coursework must be completed at The University of Toledo.

- It is ultimately the responsibility of the student to assure that all administrative and academic requirements have been met.
- Professional and ethical behavior is expected from each student throughout the occupational therapy program. Behaviors align with the American Occupational Therapy Association's ethical standards for practice.

Code	Title	Hours
OCCT 7110	OT Research I: Evidenced-Informed Practice	4
OCCT 7120	OT Research II: Scholarly Project Proposal	2
OCCT 7130	OT Research III: Scholarly Project Implementation	2
OCCT 8140	OT Research IV: Scholarly Project Completion	2
OCCT 8150	OT Research V: Scholarly Project Presentation	2
OCCT 7210	OT Advocacy I: Education in Healthcare	2
OCCT 7220	OT Advocacy II: Community & Academic Education	2
OCCT 8230	OT Advocacy III: Advocacy & Populations	2
OCCT 8240	OT Advocacy IV: Leadership & Management	3
OCCT 7410	OT Foundations I: Domain & Process	3
OCCT 7420	OT Foundations II: Models of Practice	4
OCCT 7430	OT Foundations III: Conditions	2
OCCT 8440	OT Foundations IV: Interprofessional Education	1
OCCT 8450	OT Foundations V: Program Development	4
OCCT 7510	OT Practice I: Human Movement & Performance	5
OCCT 7520	OT Practice II: Neuroscience	5
OCCT 7530	OT Practice III: Children & Youth	3
OCCT 7540	OT Practice IV: Neurorehabilitation	3
OCCT 8550	OT Practice V: Physical Rehabilitation	5
OCCT 8560	OT Practice VI: Behavioral & Mental Health	3
OCCT 8570	OT Practice VII: Professional Reasoning Across the Lifespan	5
OCCT 8580	OT Practice VIII: Clinical Care	2
OCCT 7710	OT Fieldwork & Professional Development I	1
OCCT 7720	OT Fieldwork & Professional Development II	1
OCCT 7730	OT Fieldwork & Professional Development III	1
OCCT 8740	OT Fieldwork & Professional Development IV	2
OCCT 8750	OT Fieldwork & Professional Development V	1
OCCT 8760	OT Fieldwork & Professional Development VI	1
OCCT 9810	OT Fieldwork: Level II A (3 credit hours, taken twice)	6
OCCT 9820	OT Fieldwork: Level II B	6
OCCT 9900	Occupational Therapy Doctorate Capstone	10
Total Hours		**95**

Unique features of the program include fieldwork or experiential opportunities in every semester, and the opportunity to complete an individualized capstone to develop specialized skills in a practice area of choice, and an individual research project.

First Term		Hours
OCCT 7110	OT Research I: Evidenced-Informed Practice	4
OCCT 7210	OT Advocacy I: Education in Healthcare	2
OCCT 7410	OT Foundations I: Domain & Process	3
OCCT 7510	OT Practice I: Human Movement & Performance	5
OCCT 7710	OT Fieldwork & Professional Development I	1
	Hours	**15**
Second Term		
OCCT 7120	OT Research II: Scholarly Project Proposal	2
OCCT 7420	OT Foundations II: Models of Practice	4
OCCT 7430	OT Foundations III: Conditions	2
OCCT 7520	OT Practice II: Neuroscience	5
OCCT 7720	OT Fieldwork & Professional Development II	1
	Hours	**14**
Third Term		
OCCT 7130	OT Research III: Scholarly Project Implementation	2
OCCT 7220	OT Advocacy II: Community & Academic Education	2
OCCT 7530	OT Practice III: Children & Youth	3
OCCT 7540	OT Practice IV: Neurorehabilitation	3
OCCT 7730	OT Fieldwork & Professional Development III	1
	Hours	**11**
Fourth Term		
OCCT 8140	OT Research IV: Scholarly Project Completion	2
OCCT 8230	OT Advocacy III: Advocacy & Populations	2
OCCT 8440	OT Foundations IV: Interprofessional Education	1
OCCT 8550	OT Practice V: Physical Rehabilitation	5
OCCT 8560	OT Practice VI: Behavioral & Mental Health	3
OCCT 8740	OT Fieldwork & Professional Development IV	2
	Hours	**15**
Fifth Term		
OCCT 8150	OT Research V: Scholarly Project Presentation	2
OCCT 8240	OT Advocacy IV: Leadership & Management	3
OCCT 8450	OT Foundations V: Program Development	4
OCCT 8570	OT Practice VII: Professional Reasoning Across the Lifespan	5
OCCT 8750	OT Fieldwork & Professional Development V	1
	Hours	**15**
Sixth Term		
OCCT 8580	OT Practice VIII: Clinical Care	2
OCCT 8760	OT Fieldwork & Professional Development VI	1
OCCT 9810	OT Fieldwork: Level II A	3
	Hours	**6**
Seventh Term		
OCCT 9810	OT Fieldwork: Level II A	3

OCCT 9820	OT Fieldwork: Level II B	6
	Hours	**9**
Eighth Term		
OCCT 9900	Occupational Therapy Doctorate Capstone	10
	Hours	**10**
	Total Hours	**95**

Note. Student must complete all Level II fieldwork within 24 months following didactic portion of the program. The capstone experience must be completed with 12 months following completion of Level II fieldwork.

- PLO 1. PRACTICE: Compare, contrast, and evaluate models of practice and integrate them with the Occupational Therapy Practice Framework.
- PLO 2. PRACTICE: Examine the interactions between occupations, client factors, performance skills, performance patterns, and contexts and environments.
- PLO 3. PRACTICE: Describe the relationship between human development and occupation from a life span perspective.
- PLO 4. PRACTICE: Distinguish the relationships between wellness and occupation, identify at risk populations and implement occupation-based interventions to enhance wellness and prevent disease.
- PLO 5. PRACTICE: Investigate and grade the demands of an occupation, reflecting the specific body structures, body functions, performance skills, and performance patterns that are required to successfully engage in occupation.
- PLO 6. PRACTICE: Interpret screening, assessment, and occupational profile data to evaluate clients' occupational performance.
- PLO 7. PRACTICE: Interpret evaluation results to diagnose problems related to occupational performance and participation.
- PLO 8. PRACTICE: Illustrate collaboration with clients to develop individualized goals for occupational performance and implement interventions to achieve them.
- PLO 9. PRACTICE: Practice occupational therapy services consistent with clients' needs and context, including reassessment and discharge.
- PLO 10. PRACTICE: Show how to effectively communicate and educate via written, oral, and nonverbal means, with clients, family members, significant others, team members, and the community at large.
- PLO 11. PRACTICE: Demonstrate therapeutic use of self, including personality, insights, perceptions, and judgments, as part of the therapeutic process.
- PLO 12. PRACTICE: Show how to effectively and professionally document all aspects of the occupational therapy process.
- PLO 13. PRACTICE: Recognize and apply codes, guidelines, polices, and standards of practice put forth by AOTA and regulatory bodies.
- PLO 14. PRACTICE: Apply accepted Practice Standards regarding supervision of and collaboration with occupational therapy assistants.
- PLO 15. ADVOCACY: Evaluate and judge the relevance of current socio-political, legal, economic, international, geographic, demographic, and health disparity issues and trends, including as they affect occupational therapy practice.
- PLO 16. ADVOCACY: Justify, design, and engage in initiatives that meet society's occupational needs within existing organizations and through new, entrepreneurial services and programs (e.g., private practice) to move the profession of occupational therapy forward as an integral discipline in health care, human services, and education.
- PLO 17. ADVOCACY: Apply principles of management, administration, and supervision (e.g., COTAs, students, other rehabilitation personnel, volunteers) into a personal framework for directing and developing occupational therapy services, personnel, and programs.
- PLO 18. ADVOCACY: Choose, design, and implement teaching/learning experiences for a variety of audiences.
- PLO 19. ADVOCACY: Practice in collaborative interprofessional practice to improve service delivery in complex systems and organizations.
- PLO 20. ADVOCACY: Demonstrate advocacy efforts for clients and the profession to influence practice, legislation, policies, and reimbursement funding.
- PLO 21. RESEARCH: Use principles of research design to describe, analyze, critique, and interpret research protocols and articles relevant to the field of occupational therapy.
- PLO 22. RESEARCH: Interpret research findings to enhance their practice and promote research in the profession at multiple levels including collaboration with independent researchers.
- PLO 23. RESEARCH: Produce and disseminate guided, individualized, scholarly projects.
- PLO 24. RESEARCH: Identify specific ways that occupational therapists can contribute to occupational therapy research, including initiation of research, collaboration in research, participation in advanced studies, application for grants, and support of research as a member of the profession of occupational therapy.
- PLO 25. RESEARCH: Explain, apply, and demonstrate professional ethics as they are pertinent to laws and institutional policies that govern client confidentiality and rights of research participants.
- PLO 26. AUTONOMOUS DECISION MAKING: Recognize and accept personal responsibility for life-long learning, professional behavior, and demeanor through reflective practice.
- PLO 27. AUTONOMOUS DECISION MAKING: Develop skill in seeking out information (e.g., library resources, electronic media, internet searches) to compile evidence in support of practice, advocacy, and research.
- PLO 28. AUTONOMOUS DECISION MAKING: Show leadership skills and guide the profession by disseminating research, conducting presentations, and assuming leadership and mentorship roles, including fieldwork education.

Doctor of Physical Therapy Program

Through education, scholarship, and service, the mission of the Doctor of Physical Therapy Program is to prepare students to be leaders in contemporary practice and to improve the human condition and the profession.

The doctor in physical therapy (DPT) program at The University of Toledo is fully accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE). The degree consists of 95 credit hours spanning 30 months beyond the bachelor's degree. Upon successful

completion of the doctor of physical therapy program, graduates are prepared for licensure and to practice within the field of physical therapy.

The deadline for applications for the UToledo DPT program is October 1, 2026 (program begins with summer enrollment). Applications should be made directly to the Physical Therapy Centralized Application Service (PTCAS), http://www.ptcas.org/

Seven out of the ten prerequisite courses MUST be completed at the time of application. Since the deadline to apply to UT's DPT Program is early October, the 7 out of 10 prerequisite courses must be completed BEFORE fall semester.

- Bachelor's degree from an accredited institution
- Minimum cumulative GPA of 3.30
- Minimum prerequisite GPA of 3.0
- Prerequisites include:
  - One course in ***each*** of the following:
    - Human Anatomy with lab[1]
    - Human Physiology with lab[1]
    - General Psychology
    - Statistics
  - Two (2) courses on a semester-based system in ***each*** of the following:
    - Biology for science majors with lab
    - Chemistry for science majors with lab
    - Physics (algebra-based)
- The following courses are highly recommended: Exercise Physiology with lab, Technical Writing
- Three letters of recommendation; one must be from a licensed physical therapist who has supervised the applicant in a health setting, one letter must be from a university or college professor who has taught the applicant in at least one class if you are a current student or one letter from an employer if you are not a current student, and one letter of your choice who is either another PT supervisor, academic reference, or who can speak on your academic or professional qualities and who is NOT a family member.
  - **Note**: If more than 3 letters of recommendation are submitted only the first 3 meeting the requirement will be considered
- Group Interview
- Knowledge of the field of physical therapy
- Shadowing a physical therapist is highly recommended to obtain knowledge of the field; however, there is not a minimum number of hours of observation or shadowing required
- Early Decision Opportunity: This opportunity is available only to University of Toledo students with junior status can apply through our Early Decision Application. Students who are accepted through Early Decision based course criteria, GPA, essay, recommendation letters, and interview will have a spot reserved in the DPT program following earning their bachelor's degree. Early Decision packet information can be found on the physical therapy website in early in spring term, Doctor of Physical Therapy Program (utoledo.edu) (https://www.utoledo.edu/hhs/pt/)

[1] Or two course sequence in Human Anatomy and Physiology.

Criminal Background Check Policy

All incoming physical therapy students are required to complete both an Ohio BCI&I check and a FBI criminal background check. In the event that the background check report identifies a history of criminal activity, the student may be at risk for not being able to successfully complete the required clinical education requirements of the DPT program. Successful completion of all designated clinical education experiences is a graduation requirement for a DPT degree. Further, students with a criminal background may be "at risk" for not meeting Physical Therapy licensure eligibility requirements in some states due to a felony conviction. To ensure that a student with a history of a felony conviction is eligible to take the Physical Therapy licensure exam, the "at risk" student will need to seek clarifying information directly from the licensure board of the state in which they wish to practice. As PT practice laws vary from state to state, it becomes the student's responsibility to know the laws of individual states regarding policies associated with the awarding of a PT license; the "at risk" student may need to petition the state licensure agency to request a declaratory order/opinion from the licensure agency.

Each student, while enrolled in the didactic and clinical portions of the physical therapy curriculum, is required to maintain evidence of compliance with required immunizations, titers, TB testing, and an annual physical examination as specified in the Student Health Form information sent in the DPT student matriculation materials. All expenses incurred in obtaining a physical, necessary laboratory tests, immunizations and any additional health requirements are the responsibility of the student. Proof of compliance is obtained by the student submitting evidence of meeting requirements to Exxat Student Compliance for approval.

It should be noted that some clinical education sites have additional health requirements (ex. drug screens, TB screening in shorter time frames). During onboarding preparations for upcoming clinicals, the student is responsible for checking with the Site Coordinator of Clinical Education to determine if there are any additional health requirements. This process should be initiated approximately 6-8 weeks prior to the start of the clinical education experience to allow adequate time for completion of any additional health requirements. If the student does not complete the clinical site's additional requirements, the student will not be able to attend that facility for their clinical education experience.

All expenses incurred in obtaining a physical, necessary laboratory tests, immunizations and additional health requirements are the responsibility of the student.

Technical Standards

The University of Toledo admits and matriculates qualified physical therapy students in accordance with the UToledo Policy of Nondiscrimination on the Basis of a Disability – The Americans with Disabilities Act, Section 504 of the Rehabilitation Act of 1973, The State of Ohio Revised Code, and other applicable statutes and regulations relating to equality of opportunity. UToledo prohibits discrimination against anyone on the basis of disability and is committed to equal access for all qualified applicants and students.

A physical therapist must have the knowledge and skills to function in a broad variety of clinical settings and to render care to a wide spectrum of patients/clients. Performing successfully as a student physical therapist involves completing significant intellectual, social and physical tasks throughout the curriculum. Students must master a broad array of basic knowledge, skills, and behaviors, including abilities in the areas of judgment, integrity, character, professional attitude and demeanor. To master these skills and behaviors, candidates/students must possess, at a minimum, abilities and skills in observation, communication, motor function, intellectual-conceptualization, behavioral and social skills. These abilities and skills comprise the categories of UToledo physical therapy program's 'Technical Standards of a Physical Therapy Student for Matriculation, and Graduation' which are further described and defined in the Student Handbook located on the DPT program website.

The technical standards provide information to allow a candidate to make an informed decision for application and are a guide to accommodation of students with disabilities. Academic adjustments can be made for disabilities in some instances, but a student must be able to perform the technical standards of the physical therapy program independently either with or without reasonable accommodation.

In adopting these standards, the UToledo physical therapy program believes it must keep in mind the ultimate safety of both students and patients who may be involved in the course of a student's education. The technical standards reflect what the physical therapy program believes are reasonable expectations for physical therapy students learning and performing patient care.

Code	Title	Hours
PHYT 5000	Gross Anatomy	5
PHYT 5350	Introduction to Examination	2
PHYT 5050	Analysis of Movement I	2
PHYT 5020	Lifespan I	2
PHYT 5060	Analysis of Movement II	3
PHYT 5110	Clinical Pathophysiology I	3
PHYT 5130	Evidence Informed Practice	4
PHYT 6460	Education in Healthcare	2
PHYT 5450	Foundations of Physical Therapy	2
PHYT 5270	Applied Exercise Physiology	3
PHYT 5090	Neuroscience	5
PHYT 5280	Therapeutic Interventions I	2
PHYT 5750	Clinical Reasoning	1
PHYT 5300	Principles of Therapeutic Exercise	2
PHYT 5900	Medical Imaging	2
PHYT 5290	Therapeutic Interventions II	2
PHYT 5120	Clinical Pathophysiology II	1
PHYT 5650	Pharmacology of Physical Therapy	1
PHYT 5850	Clinical Education Experience I	3
PHYT 6020	Lifespan II	2
PHYT 6260	Cardiovascular-Pulmonary Physical Therapy	3
PHYT 6500	Musculoskeletal Rehab I	3
PHYT 6510	Musculoskeletal Rehab II	3
PHYT 6600	Neuromuscular Rehab I	3
PHYT 6610	Neuromuscular Rehab II	3
PHYT 6620	Pediatric Rehabilitation	2
PHYT 6100	Health Promotion	2
PHYT 6700	Professional Issues	1
PHYT 6740	Clinical Seminar I	2
PHYT 6750	Clinical Seminar II	2
PHYT 6850	Clinical Education Experience II	5
PHYT 7050	Practice Management	2
PHYT 7320	Medical Screening	1
PHYT 7890	Clinical Education Experience III	4
PHYT 7900	Clinical Education Experience IV	6
Select one of the following sets:		4
PHYT 6170	Scholarly Project I	
or PHYT 6720	Special Topics in Physical Therapy I	
PHYT 6180	Scholarly Project II	
or PHYT 673	Special Topics in Physical Therapy II	
Total Hours		**95**

This three year full-time degree includes integrated clinical experiences and internships as well as a scholarly project.

First Term		Hours
PHYT 5000	Gross Anatomy	5
PHYT 5350	Introduction to Examination	2
PHYT 5050	Analysis of Movement I	2
	Hours	**9**
Second Term		
PHYT 5450	Foundations of Physical Therapy	2
PHYT 6460	Education in Healthcare	2
PHYT 5110	Clinical Pathophysiology I	3
PHYT 5130	Evidence Informed Practice	4
PHYT 5060	Analysis of Movement II	3
	Hours	**14**
Third Term		
PHYT 5270	Applied Exercise Physiology	3
PHYT 5280	Therapeutic Interventions I	2
PHYT 5300	Principles of Therapeutic Exercise	2
PHYT 5750	Clinical Reasoning	1
PHYT 5900	Medical Imaging	2
PHYT 5090	Neuroscience	5
	Hours	**15**
Fourth Term		
PHYT 5020	Lifespan I	2
PHYT 5290	Therapeutic Interventions II	2
PHYT 5120	Clinical Pathophysiology II	1
PHYT 5650	Pharmacology of Physical Therapy	1
PHYT 6170 or PHYT 6720	Scholarly Project I or Special Topics in Physical Therapy I	2
PHYT 5850	Clinical Education Experience I	3
	Hours	**11**

Fifth Term		
PHYT 6260	Cardiovascular-Pulmonary Physical Therapy	3
PHYT 6020	Lifespan II	2
PHYT 6500	Musculoskeletal Rehab I	3
PHYT 6600	Neuromuscular Rehab I	3
PHYT 6740	Clinical Seminar I	2
PHYT 7050	Practice Management	2
	Hours	**15**
Sixth Term		
PHYT 6180 or PHYT 6730	Scholarly Project II or Special Topics in Physical Therapy II	2
PHYT 6100	Health Promotion	2
PHYT 6510	Musculoskeletal Rehab II	3
PHYT 6610	Neuromuscular Rehab II	3
PHYT 6750	Clinical Seminar II	2
PHYT 6620	Pediatric Rehabilitation	2
	Hours	**14**
Seventh Term		
PHYT 6850	Clinical Education Experience II	5
PHYT 7890	Clinical Education Experience III	4
PHYT 7320	Medical Screening	1
PHYT 6700	Professional Issues	1
	Hours	**11**
Eighth Term		
PHYT 7900	Clinical Education Experience IV	6
	Hours	**6**
	Total Hours	**95**

- PLO 1. Students will demonstrate the requisite knowledge and skills to practice safely and effectively as entry-level physical therapists.
- PLO 2. Students and graduates will demonstrate effective communication skills and professional behavior when interacting with patients, families, professional colleagues, and the public.
- PLO 3. Students and graduates will practice in a legal, ethical, and fair manner.
- PLO 4. Students and graduates will demonstrate a commitment to the profession through advocacy and community service.
- PLO 5. Graduates will engage in lifelong learning and professional development opportunities.

Department of Human Services

JENNIFER REYNOLDS, CHAIR

Degrees Offered

- Master of Arts in Counselor Education (p. 100)
- Master of Arts in School Psychology (p. 103)
- Master of Social Work (MSW) (p. 104)
- Education Specialist in School Psychology (p. 106)
- Graduate Certificate in Clinical Mental Health Counseling (p. 108)
- Graduate Certificate in School Counseling (p. 109)

COUN 5010 Professional Orientation To School Counseling
[4 credit hours]
This course is an introduction to the profession of school counseling including the historical foundations, roles and responsibilities, legal and ethical issues, implications of sociocultural diversity, organization and administration, and future trends within the context of the school community.
Term Offered: Spring, Summer, Fall

COUN 5020 Professional Orientation to Clinical Mental Health Counseling
[4 credit hours]
An orientation to the counseling profession; ethical and legal issues, counseling process, skills and theories; counselor roles, functions and work settings; and historical foundations of counseling.
Term Offered: Spring, Summer, Fall

COUN 5110 Career Counseling And Development
[3 credit hours]
Theories, resources and practices of career counseling and development are presented. Knowledge and skills for promoting career growth among a broad range of individuals across the life span is emphasized.
Term Offered: Spring, Summer, Fall

COUN 5120 Individual And Group Assessment
[3 credit hours]
This course provides an in-depth understanding of psychological testing through (1) an overview of basic testing concepts, (2) an understanding of test construction, (3) familiarity with instruments and (4) an overview of using test results. History and rationale of testing are included.
Term Offered: Summer, Fall

COUN 5130 Group Counseling
[4 credit hours]
This course provides training and experience in group development, dynamics, theories, methods and skills of group counseling, group leadership, research and evaluation, ethical issues, and other group work approaches. Multicultural issues, advocacy, and wellness will be explored throughout the course.
Prerequisites: (COUN 5140 with a minimum grade of C or COUN 7140 with a minimum grade of C) and (COUN 5180 with a minimum grade of C or COUN 7180 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

COUN 5140 Counseling Theories and Application
[4 credit hours]
Includes a study of counseling and consultation theories and application of theory in therapeutic/helping relationships from individual, group, and systemic perspectives.
Term Offered: Spring, Summer, Fall

COUN 5150 Counseling Across The Life Span
[3 credit hours]
This course provides training in the theoretical understanding and processes of human development (e.g., social, affective, familial, cognitive, physical) from prenatal stages through older adulthood. Counseling approaches relevant to theoretical principles will be presented. Multicultural issues, advocacy, wellness, and ethical issues will be explored throughout the course. Theories of individual and family development across the lifespan are examined. Developmental processes of individuals and families and implications for counseling are presented from a multi#generational family perspective.
Term Offered: Spring, Summer, Fall

COUN 5160 Cultural Diversity For Counselors And School Psychologists
[3 credit hours]
This course addresses sociocultural diversity, multicultural, and social justice concepts related to self and others. Throughout the course the tripartite model of multicultural attitudes, knowledge, and skills will be explored using an inclusive definition of multiculturalism. We will examine multiculturalism and social justice on individual, community, and systemic levels. Wellness, prevention, and advocacy will also be infused throughout the course. Addresses the cross cultural theories, knowledge, beliefs and techniques required for providing effective services to culturally diverse populations. Examines assumptions about cultural differences, which underlie counseling theories and therapies.
Term Offered: Spring, Summer, Fall

COUN 5180 Counseling Skills
[4 credit hours]
This course is an introduction to the basic helping/microskills used in individual, group, and systemic therapeutic settings. These are the foundational counseling skills necessary in the preparation of school and clinical mental health counselors. Supervised training prepares students for their entry-level clinical practicum experience.
Term Offered: Spring, Fall

COUN 5190 Counseling Practicum
[4 credit hours]
Students receive supervised, practical experiences in providing counseling services to clients. Performance of counseling skills; relationship skills; intervention techniques; documentation skills; and professional, ethical and legal conduct is expected.
Term Offered: Spring, Summer, Fall

COUN 5600 Psychopathology: Conceptualizations and Assessment
[4 credit hours]
This course explores conceptualizations of psychopathology, the assessment thereof, and subsequent treatment planning in counseling. #Special emphasis will be given to the MMPI, NEO-PI, MCMI, and a battery of substance use disorder screens.
Prerequisites: COUN 5120 with a minimum grade of C
Term Offered: Spring, Fall

COUN 5980 Special Topics In Counseling, Mental Health, And School Psychology
[1-8 credit hours]
This course is open to a graduate student pursuing a master's, specialist or doctoral degree program and may be a requirement of that program.
Term Offered: Spring, Summer, Fall

COUN 6000 Counseling Research and Program Evaluation
[3 credit hours]
This course focuses on the research and program evaluation in professional counseling, covering basic statistics and related research design with specific applications counseling. Students will be expected to critique existing counseling research. Material covered in this course should provide the student with the skills necessary to be a competent consumer as well as producer of research. Students will gain skills in the preparation of research problems, design and implementation of quantitative and qualitative research and methodology in the field of counseling.
Term Offered: Spring, Summer, Fall

COUN 6100 Comprehensive School Counseling Programs
[4 credit hours]
Emphasis in this course is placed on the skills necessary to assess K-12 students' needs, design a program of comprehensive services, and coordinate, implement, and evaluate the program's activities. This includes counseling strategies for the school counselor that promote academic and personal/social development in children and youth. Finally, a thorough study of consulting models and techniques to help school counselors develop consultation skills, which may be applied when working with school personnel, administrators, parents, and mental health clinicians in community agencies, or other settings.
Prerequisites: COUN 5010 with a minimum grade of B-
Term Offered: Spring

COUN 6110 Counseling Diverse Learners in the K-12 Setting
[3 credit hours]
This course provides school counseling students with an overview of special education services and the unique needs of diverse learners in the K-12 setting. Students will explore the categories of eligibility for special education and gifted services, education law, and the 504 process. Additional topics include the identification of students through RTI or MTSS and appropriate interventions the school counselor can implement to support diverse learners across the academic, social/emotional and career domains.
Term Offered: Spring, Fall

COUN 6200 Advanced Counseling Skills
[3 credit hours]
As a primarily experiential course, COUN 6200 is designed to advance students' professional competencies in counseling theory, skills, and reflective practice. This course builds upon the prior learning experiences acquired in COUN 5140 (Counseling Theories) and Counseling Skills (COUN 5180). Students will practice in theoretically consistent skills and techniques and will adhere to the Ethical and Professional Standards set forth by the American Counseling Association Code of Ethics.
Prerequisites: COUN 5140 with a minimum grade of C and COUN 5180 with a minimum grade of C
Term Offered: Spring

COUN 6220 Child, Adolescent, Family Therapy
[3 credit hours]
Specialized study of therapeutic techniques commonly emphasized in working with children, adolescents and their families. Approaches to family therapy in a multicultural context, family assessment and ethical issues will be emphasized.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Summer, Fall

COUN 6230 Crisis Intervention Counseling
[3 credit hours]
Instruction in the theories, skills and techniques necessary to intervene into a variety of crisis situations such as suicide, violence, domestic violence, drug and alcohol abuse and family dysfunction.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

COUN 6240 Diagnosis And Mental Health
[4 credit hours]
Study of the signs, symptoms, etiology and psychodynamics of various mental and emotional disorders based on the most current edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM).
Term Offered: Summer, Fall

COUN 6460 Substance Abuse Counseling
[4 credit hours]
Review of treatment approaches, techniques and programs for counseling individuals and families experiencing substance-related problems.
Term Offered: Spring, Fall

COUN 6940 Counseling Internship
[1-8 credit hours]
The course is intended to provide counselor education doctoral students with student-directed, practical experiences in which they can develop advanced skills in various facets of counselor education (e.g., clinical counseling, advocacy, instruction, research, leadership, clinical supervision). Multicultural issues, ethics, professional issues, and wellness will be explored throughout the course. Supervised practical experiences in various settings while assuming a spectrum of counseling roles and functions. Emphasis is placed upon integrating ethical practice, theory, and research in work settings.
Prerequisites: COUN 5190 with a minimum grade of B or CMHS 5190 with a minimum grade of B
Term Offered: Spring, Summer, Fall

COUN 6990 Master's Independent Study
[1-4 credit hours]
Provides students the opportunity to work independently on professional problems under the direction of a faculty member in the Department of Counseling and Mental Health Services.
Term Offered: Spring, Summer, Fall

COUN 7140 Counseling Theories and Application
[4 credit hours]
Includes a study of counseling and consultation theories and application of theory in therapeutic/helping relationships from individual, group, and systemic perspectives.
Term Offered: Spring, Summer, Fall

COUN 7160 Cultural Diversity For Counselors And School Psychologists
[3 credit hours]
This course addresses sociocultural diversity, multicultural, and social justice concepts related to self and others. Throughout the course the tripartite model of multicultural attitudes, knowledge, and skills will be explored using an inclusive definition of multiculturalism. We will examine multiculturalism and social justice on individual, community, and systemic levels. Wellness, prevention, and advocacy will also be infused throughout the course. Addresses the cross cultural theories, knowledge, beliefs and techniques required for providing effective services to culturally diverse populations. Examines assumptions about cultural differences, which underlie counseling theories and therapies.
Term Offered: Spring, Summer, Fall

COUN 7220 Child, Adolescent, Family Therapy
[3 credit hours]
Specialized study of therapeutic techniques commonly emphasized in working with children, adolescents and their families. Approaches to family therapy in a multicultural context, family assessment and ethical issues will be emphasized.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Summer, Fall

COUN 7230 Crisis Intervention Counseling
[3 credit hours]
Instruction in the theories, skills and techniques necessary to intervene into a variety of crisis situations such as suicide, violence, domestic violence, drug and alcohol abuse and family dysfunction.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

COUN 7240 Diagnosis And Mental Health
[4 credit hours]
Study of the signs, symptoms, etiology and psychodynamics of various mental and emotional disorders based on the most current edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM).
Term Offered: Summer, Fall

COUN 8460 Substance Abuse Counseling
[4 credit hours]
Review of treatment approaches, techniques and programs for counseling individuals and families experiencing substance-related problems.
Term Offered: Spring, Fall

COUN 8960 Doctoral Research Dissertation
[1-12 credit hours]
Dissertation credit may not total less than 10 semester hours and no greater than 32 hours. A doctoral student may register for such credit in more than one semester.
Term Offered: Spring, Summer, Fall

RCRT 5040 Recreational Therapy Services within the Veterans Administration
[3 credit hours]
The course will focus on current trends, issues, and clinical techniques specific to serving Veterans within the Veteran's Administration VA system as a Recreational Therapist. Course content will include orientation to military culture and rituals, specific diagnoses, and conditions commonly experienced by Veterans, delivery of outcome-based RT interventions and special programs, partnerships, and an in-depth look into internships and employment opportunities within the VA system.
Term Offered: Spring, Fall

RCRT 5300 Inclusion and Recreational Therapy Services
[3 credit hours]
An introductory course which defines the principals of inclusion and major legislation that impacts the provision and delivery of recreational therapy services for individuals with disabilities. Thirty hour volunteer component required. Minimum "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5310 Leisure And Popular Culture
[3 credit hours]
This course provides the graduate student with an advanced understanding of leisure theory, philosophy, and behavior and its application to the delivery of leisure services within contemporary culture.
Term Offered: Summer, Fall

RCRT 5320 Administration In Recreational Therapy
[3 credit hours]
This course focuses on the administrative functions of delivering Recreational Therapy services. Students will gain an understanding of the aspects of management principles including ethics, legislation, technology, quality management, risk management, financial and human resources, marketing, and accrediting agencies. Minimum "C" required for RCRT majors. Note: Senior Standing and Acceptance in the Recreational Therapy program.
Term Offered: Spring, Fall

RCRT 5330 Administration in Recreation Services
[3 credit hours]
This course focuses on the administrative functions of Recreation and Recreation-Related services. Students will gain an understanding of the aspects of management principles including theoretical foundations, program and administrative planning, evaluation, maintenance, facility management, budgeting, human resources, and professional development.
Term Offered: Spring

RCRT 5340 Leisure, Recreation, And Aging in Recreational Therapy Practice
[3 credit hours]
This course provides a study of the impacts of aging on leisure and recreation activities during middle and later adulthood by investigating the aging process, leisure across the lifespan, and the impact of leisure and recreation on quality of life and wellness from an RT perspective. Minimum grade of "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5410 Facility Planning and Design
[3 credit hours]
This course provides the graduate student with an advanced understanding of, and ability to apply, the principles of design and the site design process to the development of recreation-based facilities. Specific areas of the design process presented include: tools of the trade, functional and aesthetic considerations, research, regional and site analysis, programming, final design development, construction, management, and evaluation.
Term Offered: Spring

RCRT 5420 Research Applications in Recreation & Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding of, and ability to apply, the basic components of research in the academic and professional practice setting including: ethics, human subject protection, research concepts, topic identification, theoretical roots, literature review development, sample selection, methodologies, instrument testing, data collection and analysis procedures, and research reporting.
Term Offered: Fall

RCRT 5560 Recreational Therapy Interventions 1
[3 credit hours]
This course provides the student the fundamental skill development needed to implement therapeutic outcomes using Recreational Therapy interventions utilizing leisure education, assistive technology, and animal assisted therapy within treatment settings. Minimum "C" required for RCRT majors. Registration restriction: Acceptance into the Recreation and Leisure master's program.
Term Offered: Fall

RCRT 5565 Recreational Therapy Interventions 2
[3 credit hours]
This course provides the student the fundamental skill development needed to implement therapeutic outcomes using Recreational Therapy interventions utilizing therapeutic art, horticulture, and stress management/relaxation therapy within treatment settings. Minimum "C" required for RCRT majors.
Term Offered: Spring

RCRT 5570 Recreational Therapy Interventions 3
[2 credit hours]
This course provides the student the fundamental skill development needed to implement therapeutic outcomes using Recreational Therapy interventions utilizing therapeutic fitness and aquatic therapy within treatment settings. Minimum "C" required for RCRT majors.
Term Offered: Fall

RCRT 5710 Outdoor and Adaptive Sports Program Delivery in Recreational Therapy Practice
[3 credit hours]
An introduction to theory and techniques related to risk management, leadership, and administration of outdoor pursuits in RT practice as it applies to working with individuals in clinical and non-clinical settings. Students will also gain an understanding of adapted sports, modification of equipment, adapted sports competition for persons with disabilities and the classification system governing adapted sports competition for veterans. Minimum "C" required for RCRT majors. Prerequisite: Senior Standing and Acceptance in the Recreational Therapy program.
Term Offered: Spring, Fall

RCRT 5720 Introduction To Therapeutic Recreation
[3 credit hours]
This course is designed to introduce the student to theories, models, principles, and history of therapeutic recreation service. Through lectures, discussions and self-directed learning activities, the student will examine the structure and function of therapeutic recreation processes in a variety of treatment settings. Minimum "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5730 Physical and Neurological Diagnosis and Conditions in Recreational Therapy Practice
[3 credit hours]
This course is designed to provide the student with in-depth knowledge of the diagnostic criteria, etiology, and symptomology related to physical, neurological, sensory, and metabolic diagnosis and conditions across the lifespan with a focus on RT practice. RT interventions, pharmacological interventions, family involvement, risk management, and other implications impacting RT practice will also be examined.
Term Offered: Fall

RCRT 5750 Group Dynamics In Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding, and ability to apply, concepts and theories of the therapeutic group process as applicable to professional practice. Students will be introduced to and practice: facilitation skills, behavior modification techniques, and effective communication and leadership skills.
Term Offered: Spring, Fall

RCRT 5760 APIE in Recreation Therapy
[3 credit hours]
This course addresses the procedures and processes of assessment, planning, implementation and evaluation of recreation therapy services.

RCRT 5790 Psychological Diagnosis and Conditions in Recreational Therapy Practice
[3 credit hours]
This course is designed to provide the student with in-depth knowledge of the diagnostic criteria, etiology, and symptomology related to psychological conditions across the lifespan with a focus on RT practice. RT interventions, pharmacological interventions, family involvement, risk management, and other implications impacting RT practice will be examined.
Term Offered: Spring

RCRT 5800 Clinical: Physical Rehabilitation
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the APIE(D) process with a physical rehabilitation population.
Term Offered: Spring, Summer, Fall

RCRT 5810 Recreational Therapy Fieldwork 1
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the Recreational Therapy APIE(D) process with a population served by a CTRS.
Term Offered: Fall

RCRT 5820 Recreational Therapy Fieldwork 2
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the APIE(D) process with a clinical population. Minimum "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5830 Recreational Therapy Fieldwork III
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the APIE(D) process with a geriatric population.
Term Offered: Spring

RCRT 5840 Recreational Therapy Fieldwork 4
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the Recreational Therapy APIE(D) process with a population served by a CTRS. Minimum "C" required for RCRT majors. Registration restriction: Acceptance into the master of arts in recreation and leisure.
Term Offered: Spring

RCRT 5870 Program Planning In Recreational Therapy
[3 credit hours]
This course requires the graduate student to apply cumulative knowledge of the APIE(D) process through designing evidence-based: treatment programs, program evaluations, protocols and treatment plans in recreation therapy practice.
Term Offered: Spring

RCRT 5930 Internship Competency in Recreational Therapy
[1 credit hour]
This course is designed to prepare graduate students for the Recreational Therapy Internship process and professional employment in recreational therapy. Students will demonstrate academic and professional competence to ensure readiness for successful completion of a Recreational Therapy Internship. Student internship expectations and professional certifications and licensure are also addressed.
Term Offered: Spring

RCRT 5940 Internship In Recreation And Leisure
[1-6 credit hours]
This course provides the graduate student with the opportunity to complete an internship under the supervision of a recreation professional in partial fulfillment for the MA degree in recreation and leisure studies.
Term Offered: Spring, Summer, Fall

RCRT 6000 Issues And Trends In Recreation/Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding of the issues and trends impacting the delivery of recreation and recreation therapy services in diverse professional settings.
Term Offered: Spring

RCRT 6020 Financial Resources Of Recreation And Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding of the finincial management concepts and resources supporting the delivery of recreation and recreation therapy services.
Term Offered: Summer, Fall

RCRT 6100 Recreation I: Leisure and Society
[4 credit hours]
This course thoroughly examines and provides understanding of the recreation and leisure services profession in relation to the historical, philosophical, behavioral, cultural, social, and economical contributions of the profession to the provision of recreation and leisure services.
Term Offered: Fall

RCRT 6110 Recreation II: Leadership
[4 credit hours]
This course thoroughly examines and provides understanding of the major components of leadership in relation to human development, cultural adaptability, communication, group dynamics, influencing behavior, conflict resolution, ethics, managing risk and effective leadership in the provision of recreation and leisure services.
Term Offered: Fall

RCRT 6120 Recreation III: Facility Design
[4 credit hours]
This course thoroughly examines and provides understanding of the processes included in designing recreation and recreation-related facilities including the history of development of the recreation facility infrastructure in the United States, tools of the trade, principles of design, functional and aesthetic considerations, research, regional and site analysis, universal design and accessibility, construction management, evaluation, and final design development.
Term Offered: Fall

RCRT 6130 Recreation IV: Liability & Risk
[4 credit hours]
This course thoroughly examines and provides understanding of risk management, legal liability, negligence, emergency action plan development, risk management plan development, and addressing and reducing risk in the provision of recreation and leisure services.
Term Offered: Spring

RCRT 6140 Recreation V: Financial Resources
[4 credit hours]
This course thoroughly examines and provides understanding of the foundations of fiscal management as it relates to fiscal planning; fiscal acquisition; sources of funding; resource allocation; budgeting; the management of assets, liabilities, equities, revenues, expenses and profits; and developing and understanding fiscal documents in the provision of recreation and leisure services.
Term Offered: Spring

RCRT 6150 Recreation VI: Administration
[4 credit hours]
This course thoroughly examines and provides understanding of management theory and practice, organization and structure, ethics, planning, decision making and problem solving, human and fiscal resources, marketing, legal issues, and evaluation in the provision of recreation and leisure services.
Term Offered: Spring

RCRT 6160 Recreation VII: Evaluation
[3 credit hours]
This course thoroughly examines and provides understanding of the common methodologies used in conducting recreation-related research and evaluation including the research process, research ethics, research methodologies, instrument development and testing, data collection and analysis, data interpretation and reporting as it relates to the provision of recreation and leisure services.
Term Offered: Summer

RCRT 6940 Recreation VIII: Internship
[3 credit hours]
This course provides the graduate student with the opportunity to complete an internship under the supervision of a recreation professional in partial fulfillment for the MA degree in recreation and leisure studies.
Term Offered: Spring, Summer, Fall

RCRT 6990 Independent Study In Recreation And Leisure
[1-3 credit hours]
This course provides the graduate student with the opportunity to develop an advanced independent learning experience in support of academic and/or professional interests.
Term Offered: Spring, Summer, Fall

SOCW 5010 Social Work Research Methods And Analysis
[3 credit hours]
Course introduces students to qualitative and quantitative research methodologies, supporting statistical methods as utilized within the social work profession, data analysis technology and evidence-based social work practice concepts.
Term Offered: Fall

SOCW 5110 Social Work Practice I
[3 credit hours]
Provides an overview of social work practice theory and paradigms to base practice with individuals, families and groups emphasizing strengths and empowerment, values and ethics, and understanding self.
Term Offered: Fall

SOCW 5120 Social Work Practice II
[3 credit hours]
Provides an overview of social work theories guiding social work practice with groups and organizations, including group development, leadership, and models of organizations within a social and economic justice framework.
Prerequisites: SOCW 5110 with a minimum grade of C and SOCW 5210 with a minimum grade of C
Term Offered: Spring

SOCW 5130 Social Work Practice III
[3 credit hours]
Provides historical and contemporary look at the social work profession, its roots in community organizing, theories underpinning group work and community organizing. Strengths and empowerment models and social justice emphasized.
Prerequisites: SOCW 5110 with a minimum grade of C
Term Offered: Spring

SOCW 5210 Micro Social Work Perspectives In Human Behavior And The Social Environment
[3 credit hours]
Course is organized on a developmental model including social work perpectives and theory on: biopsychosocial aspects of human growth and development. Critical analysis encouraged through social justice conceptualizations.
Term Offered: Fall

SOCW 5220 Macro Social Work Perspectives In Human Behavior And The Social Environment
[3 credit hours]
Course views the behavior of groups, organizations, and communities and their environmental contexts through a social work perspective. Attention focuses on issues of diversity, oppression, and social and economic justice.
Prerequisites: SOCW 5210 with a minimum grade of C
Term Offered: Spring

SOCW 5330 Policy Issues And Analysis In Social Work
[3 credit hours]
Course covers the history of social work profession and major institutions. Through current policy issues, methods of policy analysis are provided. Students are introduced to various methods of policy practice.
Term Offered: Fall

SOCW 5900 Foundation Field Experience and Integrative Seminar I
[3 credit hours]
Students participate in a weekly seminar to integrate classroom learning to the field experience; and during the 3rd week begin a 208 hour field experience in an assigned agency. The course must be taken in consecutive semesters with SOCW 5910.
Prerequisites: SOCW 5010 (may be taken concurrently) with a minimum grade of C and SOCW 5330 (may be taken concurrently) with a minimum grade of C and SOCW 5110 (may be taken concurrently) with a minimum grade of C and SOCW 5210 (may be taken concurrently) with a minimum grade of C
Term Offered: Fall

SOCW 5910 Foundation Field Experience and Integrative Seminar II
[3 credit hours]
Students continue in the field agency assigned in SOCW 5900; complete 217 field hours; and participate in the same weekly integrative field seminar section. SOCW 5900 and 5910 must be taken in consecutive semesters.
Prerequisites: SOCW 5900 (may be taken concurrently) with a minimum grade of C and SOCW 5120 (may be taken concurrently) with a minimum grade of C and SOCW 5220 (may be taken concurrently) with a minimum grade of C and SOCW 5130 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring

SOCW 6030 Research Methods For Macro Social Work Practice
[3 credit hours]
Covers research methods specific to macro social work practice especially needs assessment and program evaluation. Content on research ethics, data management, and evidence based practice are addressed. Prerequisites: All 5000 level courses, advanced standing status or permission of instructor.
Term Offered: Fall

SOCW 6040 Research Methods For Micro Social Work Practice
[3 credit hours]
Course covers evaluation of client accomplishments through subject design methods. Content on research Ethics, data management, and evidence based practice are addressed. Prerequisites: all 5000-level courses, advanced standing status or by permission of instructor.
Term Offered: Fall

SOCW 6110 Advanced Generalist Practice I
[3 credit hours]
Advanced study of generalist social work practice and theory when working with individuals, families, and groups with an intergenerational focus on social and economic justice. All SOCW 5000-level courses, Advanced Standing Status, or Permission.
Term Offered: Summer, Fall

SOCW 6120 Advanced Generalist Practice II
[3 credit hours]
Course provides advanced content on social work practice in organizations including financial management, supervision and planning. Incorporates current theoretical perspectives and research on effective practice. Prerequisite: SOCW 6110 with a B or better, or permission of instructor.
Prerequisites: SOCW 6110 with a minimum grade of C
Term Offered: Spring

SOCW 6130 Advanced Generalist Practice III
[3 credit hours]
Course provides advanced content on social work practice within the community and with groups. Particular attention is paid to community change processes and social and economic justice. Prerequisite: SOCW 6110 and 6140 with a B or better.
Prerequisites: SOCW 6110 with a minimum grade of C
Term Offered: Spring

SOCW 6140 Advanced Social Work Assessment
[3 credit hours]
Course provides an overview of theories and methods of social work assessment with an emphasis on psychosocial assessment, macro assessments and various tools used by social workers for asssessment purposes. Prerequisites all 5000 level corses, advaced standing status. or by permission.
Term Offered: Spring, Summer, Fall

SOCW 6200 Disparities, Diversity and Social Justice
[2 credit hours]
This graduate social work course provides students with an understanding of the impact of social inequalities when working within diverse systems. Using self-reflection and critical analysis, students will build cultural and linguistic competence. This course examines the mechanisms of privilege and oppression that impact the experiences of diverse populations, using theories of critical multiculturalism and intersectionality. This course will enhance students' knowledge, values, and attitudes about social work practice at micro, mezzo, and macro levels.
Term Offered: Spring, Summer, Fall

SOCW 6410 Social Work Micro Practice with Children and Families
[3 credit hours]
Course provides students with specialized knowledge about clinical practice with children and families. Included are major theoretical perspectives and practices currently accepted in the field, with an emphasis on strengths and empowerment.
Term Offered: Fall

SOCW 6430 Social Work Macro Practice involving Children and Families
[3 credit hours]
This is the second of two Child and Family specialization courses. It provides knowledge about current social work issues and practices in the mezzo and macro practice arenas, including social work practice related to laws, regulations, and policies concerning services for children and families.
Prerequisites: SOCW 6410 with a minimum grade of C
Term Offered: Spring

SOCW 6510 Social Work Micro Practice in Mental Health
[3 credit hours]
This course Provides MSW students with specialized knowledge about clinical practice in mental-behavioral health settings. The focus includes social works history of involvement with the primary prevention, diagnosis and treatment of mental and emotional disorders. Major emphasis is placed on social work practice at these levels with emphasis on social and economic justice.
Prerequisites: SOCW 6140 with a minimum grade of C
Term Offered: Fall

SOCW 6530 Social Work Macro Practice in Mental Health
[3 credit hours]
This is the second of two mental health specialization courses. It provides knowledge about current social work issues in the mezzo-macro practice arena, including social work practice related to laws regulations and policies concerning mental health services. Major emphasis is placed on social work practice at these levels with emphasis on social and economic justice.
Prerequisites: SOCW 6510 with a minimum grade of C
Term Offered: Spring

SOCW 6900 ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR I
[5 credit hours]
Students are assigned to a field agency; complete 360 field hours; and attend a weekly seminar to integrate classroom learning to the field experience. SOCW 6900 and SOCW 6910 must be taken in consecutive semesters.
Prerequisites: SOCW 6460 with a minimum grade of B and SOCW 6410 (may be taken concurrently) with a minimum grade of B or SOCW 6510 (may be taken concurrently) with a minimum grade of B and SOCW 6560 with a minimum grade of B
Term Offered: Fall

SOCW 6910 ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR II
[5 credit hours]
Students continue placement in the field agency assigned in SOCW 6900; complete 360 field hoursl and participate in same weekly integrative field seminar section. SOCW 6900 and 6910 must be taken in consecutive semesters.
Prerequisites: SOCW 6900 with a minimum grade of B and SOCW 6430 (may be taken concurrently) with a minimum grade of B or SOCW 6530 (may be taken concurrently) with a minimum grade of B
Term Offered: Spring

SOCW 6980 Special Topics In Social Work
[1-3 credit hours]
Content will vary as instructors present a single concentration on developments, problems, and controversies in social work.
Term Offered: Spring, Summer, Fall

SOCW 6990 Independent Study In Social Work
[1-3 credit hours]
Directed study in social work under the supervision of a social work faculty member.
Term Offered: Spring, Summer, Fall

COUN 5010 Professional Orientation To School Counseling
[4 credit hours]
This course is an introduction to the profession of school counseling including the historical foundations, roles and responsibilities, legal and ethical issues, implications of sociocultural diversity, organization and administration, and future trends within the context of the school community.
Term Offered: Spring, Summer, Fall

COUN 5020 Professional Orientation to Clinical Mental Health Counseling
[4 credit hours]
An orientation to the counseling profession; ethical and legal issues, counseling process, skills and theories; counselor roles, functions and work settings; and historical foundations of counseling.
Term Offered: Spring, Summer, Fall

COUN 5110 Career Counseling And Development
[3 credit hours]
Theories, resources and practices of career counseling and development are presented. Knowledge and skills for promoting career growth among a broad range of individuals across the life span is emphasized.
Term Offered: Spring, Summer, Fall

COUN 5120 Individual And Group Assessment
[3 credit hours]
This course provides an in-depth understanding of psychological testing through (1) an overview of basic testing concepts, (2) an understanding of test construction, (3) familiarity with instruments and (4) an overview of using test results. History and rationale of testing are included.
Term Offered: Summer, Fall

COUN 5130 Group Counseling
[4 credit hours]
This course provides training and experience in group development, dynamics, theories, methods and skills of group counseling, group leadership, research and evaluation, ethical issues, and other group work approaches. Multicultural issues, advocacy, and wellness will be explored throughout the course.
Prerequisites: (COUN 5140 with a minimum grade of C or COUN 7140 with a minimum grade of C) and (COUN 5180 with a minimum grade of C or COUN 7180 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

COUN 5140 Counseling Theories and Application
[4 credit hours]
Includes a study of counseling and consultation theories and application of theory in therapeutic/helping relationships from individual, group, and systemic perspectives.
Term Offered: Spring, Summer, Fall

COUN 5150 Counseling Across The Life Span
[3 credit hours]
This course provides training in the theoretical understanding and processes of human development (e.g., social, affective, familial, cognitive, physical) from prenatal stages through older adulthood. Counseling approaches relevant to theoretical principles will be presented. Multicultural issues, advocacy, wellness, and ethical issues will be explored throughout the course. Theories of individual and family development across the lifespan are examined. Developmental processes of individuals and families and implications for counseling are presented from a multi#generational family perspective.
Term Offered: Spring, Summer, Fall

COUN 5160 Cultural Diversity For Counselors And School Psychologists
[3 credit hours]
This course addresses sociocultural diversity, multicultural, and social justice concepts related to self and others. Throughout the course the tripartite model of multicultural attitudes, knowledge, and skills will be explored using an inclusive definition of multiculturalism. We will examine multiculturalism and social justice on individual, community, and systemic levels. Wellness, prevention, and advocacy will also be infused throughout the course. Addresses the cross cultural theories, knowledge, beliefs and techniques required for providing effective services to culturally diverse populations. Examines assumptions about cultural differences, which underlie counseling theories and therapies.
Term Offered: Spring, Summer, Fall

COUN 5180 Counseling Skills
[4 credit hours]
This course is an introduction to the basic helping/microskills used in individual, group, and systemic therapeutic settings. These are the foundational counseling skills necessary in the preparation of school and clinical mental health counselors. Supervised training prepares students for their entry-level clinical practicum experience.
Term Offered: Spring, Fall

COUN 5190 Counseling Practicum
[4 credit hours]
Students receive supervised, practical experiences in providing counseling services to clients. Performance of counseling skills; relationship skills; intervention techniques; documentation skills; and professional, ethical and legal conduct is expected.
Term Offered: Spring, Summer, Fall

COUN 5600 Psychopathology: Conceptualizations and Assessment
[4 credit hours]
This course explores conceptualizations of psychopathology, the assessment thereof, and subsequent treatment planning in counseling. #Special emphasis will be given to the MMPI, NEO-PI, MCMI, and a battery of substance use disorder screens.
Prerequisites: COUN 5120 with a minimum grade of C
Term Offered: Spring, Fall

COUN 5980 Special Topics In Counseling, Mental Health, And School Psychology
[1-8 credit hours]
This course is open to a graduate student pursuing a master's, specialist or doctoral degree program and may be a requirement of that program.
Term Offered: Spring, Summer, Fall

COUN 6000 Counseling Research and Program Evaluation
[3 credit hours]
This course focuses on the research and program evaluation in professional counseling, covering basic statistics and related research design with specific applications counseling. Students will be expected to critique existing counseling research. Material covered in this course should provide the student with the skills necessary to be a competent consumer as well as producer of research. Students will gain skills in the preparation of research problems, design and implementation of quantitative and qualitative research and methodology in the field of counseling.
Term Offered: Spring, Summer, Fall

COUN 6100 Comprehensive School Counseling Programs
[4 credit hours]
Emphasis in this course is placed on the skills necessary to assess K-12 students' needs, design a program of comprehensive services, and coordinate, implement, and evaluate the program's activities. This includes counseling strategies for the school counselor that promote academic and personal/social development in children and youth. Finally, a thorough study of consulting models and techniques to help school counselors develop consultation skills, which may be applied when working with school personnel, administrators, parents, and mental health clinicians in community agencies, or other settings.
Prerequisites: COUN 5010 with a minimum grade of B-
Term Offered: Spring

COUN 6110 Counseling Diverse Learners in the K-12 Setting
[3 credit hours]
This course provides school counseling students with an overview of special education services and the unique needs of diverse learners in the K-12 setting. Students will explore the categories of eligibility for special education and gifted services, education law, and the 504 process. Additional topics include the identification of students through RTI or MTSS and appropriate interventions the school counselor can implement to support diverse learners across the academic, social/emotional and career domains.
Term Offered: Spring, Fall

COUN 6200 Advanced Counseling Skills
[3 credit hours]
As a primarily experiential course, COUN 6200 is designed to advance students' professional competencies in counseling theory, skills, and reflective practice. This course builds upon the prior learning experiences acquired in COUN 5140 (Counseling Theories) and Counseling Skills (COUN 5180). Students will practice in theoretically consistent skills and techniques and will adhere to the Ethical and Professional Standards set forth by the American Counseling Association Code of Ethics.
Prerequisites: COUN 5140 with a minimum grade of C and COUN 5180 with a minimum grade of C
Term Offered: Spring

COUN 6220 Child, Adolescent, Family Therapy
[3 credit hours]
Specialized study of therapeutic techniques commonly emphasized in working with children, adolescents and their families. Approaches to family therapy in a multicultural context, family assessment and ethical issues will be emphasized.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Summer, Fall

COUN 6230 Crisis Intervention Counseling
[3 credit hours]
Instruction in the theories, skills and techniques necessary to intervene into a variety of crisis situations such as suicide, violence, domestic violence, drug and alcohol abuse and family dysfunction.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

COUN 6240 Diagnosis And Mental Health
[4 credit hours]
Study of the signs, symptoms, etiology and psychodynamics of various mental and emotional disorders based on the most current edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM).
Term Offered: Summer, Fall

COUN 6460 Substance Abuse Counseling
[4 credit hours]
Review of treatment approaches, techniques and programs for counseling individuals and families experiencing substance-related problems.
Term Offered: Spring, Fall

COUN 6940 Counseling Internship
[1-8 credit hours]
The course is intended to provide counselor education doctoral students with student-directed, practical experiences in which they can develop advanced skills in various facets of counselor education (e.g., clinical counseling, advocacy, instruction, research, leadership, clinical supervision). Multicultural issues, ethics, professional issues, and wellness will be explored throughout the course. Supervised practical experiences in various settings while assuming a spectrum of counseling roles and functions. Emphasis is placed upon integrating ethical practice, theory, and research in work settings.
Prerequisites: COUN 5190 with a minimum grade of B or CMHS 5190 with a minimum grade of B
Term Offered: Spring, Summer, Fall

COUN 6990 Master's Independent Study
[1-4 credit hours]
Provides students the opportunity to work independently on professional problems under the direction of a faculty member in the Department of Counseling and Mental Health Services.
Term Offered: Spring, Summer, Fall

COUN 7140 Counseling Theories and Application
[4 credit hours]
Includes a study of counseling and consultation theories and application of theory in therapeutic/helping relationships from individual, group, and systemic perspectives.
Term Offered: Spring, Summer, Fall

COUN 7160 Cultural Diversity For Counselors And School Psychologists
[3 credit hours]
This course addresses sociocultural diversity, multicultural, and social justice concepts related to self and others. Throughout the course the tripartite model of multicultural attitudes, knowledge, and skills will be explored using an inclusive definition of multiculturalism. We will examine multiculturalism and social justice on individual, community, and systemic levels. Wellness, prevention, and advocacy will also be infused throughout the course. Addresses the cross cultural theories, knowledge, beliefs and techniques required for providing effective services to culturally diverse populations. Examines assumptions about cultural differences, which underlie counseling theories and therapies.
Term Offered: Spring, Summer, Fall

COUN 7220 Child, Adolescent, Family Therapy
[3 credit hours]
Specialized study of therapeutic techniques commonly emphasized in working with children, adolescents and their families. Approaches to family therapy in a multicultural context, family assessment and ethical issues will be emphasized.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Summer, Fall

COUN 7230 Crisis Intervention Counseling
[3 credit hours]
Instruction in the theories, skills and techniques necessary to intervene into a variety of crisis situations such as suicide, violence, domestic violence, drug and alcohol abuse and family dysfunction.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

COUN 7240 Diagnosis And Mental Health
[4 credit hours]
Study of the signs, symptoms, etiology and psychodynamics of various mental and emotional disorders based on the most current edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM).
Term Offered: Summer, Fall

COUN 8460 Substance Abuse Counseling
[4 credit hours]
Review of treatment approaches, techniques and programs for counseling individuals and families experiencing substance-related problems.
Term Offered: Spring, Fall

COUN 8960 Doctoral Research Dissertation
[1-12 credit hours]
Dissertation credit may not total less than 10 semester hours and no greater than 32 hours. A doctoral student may register for such credit in more than one semester.
Term Offered: Spring, Summer, Fall

SPSY 5030 Role And Function Of The School Psychologist
[3 credit hours]
Designed for school psychology students to develop an understanding of the school psychologist as a member of the school staff. It also serves as an introduction to each of the important concepts in current practice, as well as the values of our specific program. Current legal & ethical responsibilities, the history of the profession, as well as current theories of service delivery will be explored.
Term Offered: Fall

SPSY 5040 Legal And Ethical Issues For School Psychologists And Counselors
[4 credit hours]
Covers the ethical standards and legal regulation in school psychology and school counseling. Ethical standards, litigation and legal regulation are examined in regard to professional practice.
Term Offered: Spring, Summer, Fall

SPSY 5060 Prepractica in School Psychology
[2 credit hours]
A two-semester pre-internship experience designed for first year school psychology graduate students to acquire knowledge of schools as systems and to gain familiarity with the role and function of the school psychologist and other related services staff. This course includes activities designed to build students' skills in delivering culturally responsive practices.
Term Offered: Spring, Fall

SPSY 5170 Consultation I: Theories And Techniques
[3 credit hours]
Designed to provide an overview of the major consultation theories and techniques and to help students develop consultation skills, which may be applied in the schools, community agencies, or other settings. Includes introduction to and practice in applying the problem solving process to school-based academic and behavior problems.
Term Offered: Spring, Summer, Fall

SPSY 5300 Psychoeducational Assessment And Interventions I
[4 credit hours]
Introduction to academic achievement and instruction and assessment methods including curriculum-based assessment. Instruction in linking assessment to evidence-based instruction and intervention, intervention strategies to improve academic outcomes.
Term Offered: Fall

SPSY 5310 Psychoeducational Assessment And Interventions II
[4 credit hours]
Introduction to standardized, norm-referenced measurement of student learning. Instruction in integrating multiple assessments to make data-based decisions and recommendations. Introduces special education assessment and report writing for students with specific learning disabilities.
Prerequisites: SPSY 5300 (may be taken concurrently) with a minimum grade of B
Term Offered: Spring

SPSY 5320 Psychoeducational Assessment And Interventions III
[4 credit hours]
Provides advanced instruction in direct and indirect assessment methods and evidence-based interventions. Instruction in comprehensive report writing linked to data-based recommendations for student behavior, social-emotional, and mental health needs.
Prerequisites: SPSY 7310 with a minimum grade of B or SPSY 5310 with a minimum grade of B
Term Offered: Spring, Summer, Fall

SPSY 5980 Special Topics In Counseling, Mental Health, And School Psychology
[1-3 credit hours]
This course is open to a graduate student pursuing a master's, specialist or doctoral degree program and may be a requirement of that program.
Term Offered: Spring, Summer

SPSY 6260 Developmental Child Psychopathology
[4 credit hours]
This course covers the influence of nature (e.g., prenatal, biological, genetic) and nurture (family, culture, and community) on typical and atypical child development. It emphasizes the development of disorders of infancy through adolescents from an ecological perspective, focusing on understanding characteristics and causes, diagnosis both medical and educational, and identifications of interventions for school and home.
Term Offered: Spring, Summer, Fall

SPSY 6300 Behavior Analysis for School Psychologists
[3 credit hours]
Course provides an in-depth introduction to concepts and principles of behavior analysis as the basis for understanding academic and behavior problems in applied settings and in the development and implementation of behavioral assessments and applied across tiers of intervention.
Term Offered: Fall

SPSY 6990 Master's Independent Study
[1-4 credit hours]
Provides students the opportunity to work independently on professional problems under the direction of a faculty member in the School Psychology Program.
Term Offered: Spring, Summer

SPSY 7170 Consultation I: Theories And Techniques
[3 credit hours]
Designed to provide an overview of the major consultation theories and techniques and to help students develop consultation skills, which may be applied in the schools, community agencies, or other settings. Includes introduction to and practice in applying the problem solving process to school-based academic and behavior problems.
Term Offered: Spring, Summer, Fall

SPSY 7180 Consultation II: School and Home Collaboration
[3 credit hours]
Provides training in universal/system-level academic interventions with an emphasis on consultation practices used to develop and sustain home and school collaboration. Includes study and review of prevention programs for student academic success and system-level academic assessment methods.
Term Offered: Spring, Summer, Fall

SPSY 7190 Consultation III:School and Community
[4 credit hours]
Provides training in universal/system-level behavior interventions with an emphasis on practices used to develop and sustain school and community collaboration. Includes instruction in system change theory, prevention programs for promoting mental health, and crisis prevention and intervention.
Term Offered: Spring, Summer, Fall

SPSY 7260 Developmental Child Psychopathology
[4 credit hours]
This course covers the influence of nature (e.g., prenatal, biological, genetic) and nurture (family, culture, and community) on typical and atypical child development. It emphasizes the development of disorders of infancy through adolescents from an ecological perspective, focusing on understanding characteristics and causes, diagnosis both medical and educational, and identifications of interventions for school and home.
Term Offered: Spring, Summer, Fall

SPSY 7310 Psychoeducational Assessment And Interventions II
[4 credit hours]
Introduction to standardized, norm-referenced measurement of student learning. Instruction in integrating multiple assessments to make data-based decisions and recommendations. Introduces special education assessment and report writing for students with specific learning disabilities.
Prerequisites: SPSY 5300 (may be taken concurrently) with a minimum grade of B
Term Offered: Spring

SPSY 7320 Psychoeducational Assessment And Interventions III
[4 credit hours]
Provides advanced instruction in direct and indirect assessment methods and evidence-based interventions. Instruction in comprehensive report writing linked to data-based recommendations for student behavior, social-emotional, and mental health needs.
Prerequisites: SPSY 7310 with a minimum grade of B or SPSY 5310 with a minimum grade of B
Term Offered: Spring, Summer, Fall

SPSY 7330 Practica in School Psychology
[1-4 credit hours]
A two semester pre-internship experience designed for second year school psychology students. Provides experience in tiered intervention design, implementation, and evaluation for behavior and academic problems. Includes practice in individual assessment for special education eligibility.
Term Offered: Spring, Summer, Fall

SPSY 7350 Psychoeducational Assessment and Interventions IV
[4 credit hours]
Provides advanced training in special education assessment and intervention to support student learning, socialization, and to enhance mental and behavioral health. Direct instruction in cognitive assessment and advanced report writing.
Prerequisites: SPSY 5310 with a minimum grade of B or SPSY 7310 with a minimum grade of B
Term Offered: Spring, Fall

SPSY 7940 Internship In School Psychology
[1-8 credit hours]
Academic year on-the-job internship experience for third year school psychology students. Conducted in a school and supervised by a school psychologist and coordinated by a university supervisor. Prepares students for the broad range of services to include tiered mental health and instructional interventions, assessment linked to intervention, consultation, special education assessment, home-school-community collaboration, and counseling.
Prerequisites: SPSY 7330 with a minimum grade of C
Term Offered: Spring, Summer, Fall

SPSY 8300 Behavior Analysis for School Psychologists
[3 credit hours]
Course provides an in-depth introduction to concepts and principles of behavior analysis as the basis for understanding academic and behavior problems in applied settings and in the development and implementation of behavioral assessments and applied across tiers of intervention.
Term Offered: Fall

SPSY 8980 Special Topics In Counseling, Mental Health, And School Psychology
[1-3 credit hours]
This course is open to a graduate student pursuing a master's, specialist or doctoral degree program and may be a requirement of that program.
Term Offered: Spring, Fall

SPSY 8990 Doctoral Independent Study
[1-4 credit hours]
Provides students the opportunity to work independently on professional problems under the direction of a faculty member in the Department of Counseling and Mental Health Services.

Master of Arts in Counselor Education

The counselor education program offers a master of arts in counselor education with specializations in school counseling or clinical mental health counseling. Both programs are nationally accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP).

The clinical mental health counseling program prepares graduates for licensure in Ohio as professional counselors or professional clinical counselors and is approved by the Ohio Counselor, Social Worker, and Marriage & Family Therapist Board. Graduates work as counselors in community mental health agencies, hospitals, college counseling centers, or in private practice. The school counseling specialization prepares graduates to work in K-12 schools. It is approved by the Ohio Department of Education. The master's degree in school counseling meets the academic requirements for K-12 school counselor licensure in Ohio and other states. Neither Ohio nor Michigan requires applicants to have teacher certification to be licensed as a school counselor. Applicants expecting to practice outside of Ohio or Michigan should consult that state's department of education to determine current certification or licensure requirements. The counselor education programs meet educational requirements for licensure or certification in Ohio, Michigan and most other states.

Master of Arts in Counselor Education: School Counseling Program

Admission

The application deadlines are January 15 and September 15. To apply to the program, applicants must meet all requirements of the College of Graduate Studies and submit the following materials to the College of Graduate Studies:

- College of Graduate Studies application for the master's degree in school counseling
- Transcripts of an undergraduate degree with a 3.0 or equivalent cumulative grade point average on a 4-point scale for all undergraduate study at all institutions attended.
- A typed, written personal statement (suggested length 2-3 pages) detailing significant personal and professional experiences that relate to the applicant's decision to pursue a career in counseling (e.g., rationale for seeking degree, commitment to counseling as a profession). The personal statement should also address such topics as the applicant's skills or knowledge, preparation through education and/or experience, strengths and weaknesses, rationale for academic deficiencies, etc.
- A professional résumé
- Three letters of recommendation, at least one of which must address the applicant's academic potential (i.e. from a university faculty member)

To be consistent with national training standards and to ensure sufficient faculty members to advise and mentor students, a limited number of applicants will be admitted into the program each year. As a result, admission is competitive. Applicants who pass the initial screening are required to interview with an admissions committee. For more information or to ask questions, contact:

Dr. Leslie Neyland-Brown
Program Coordinator
Leslie.Neyland@utoledo.edu
419.530.6125

Master of Arts in Counselor Education: Clinical Mental Health Counseling

Admission

The application deadlines are September 15, January 15, or May 15. To apply to the program, applicants must meet all requirements of the College of Graduate Studies and submit the following materials to the College of Graduate Studies:

- College of Graduate Studies application for the master's degree in clinical mental health counseling
- Transcripts of an undergraduate degree with a 3.0 or equivalent cumulative grade point average on a 4-point scale for all undergraduate study at all institutions attended.
- A typed, written personal statement (suggested length 2-3 pages) detailing significant personal and professional experiences that relate to the applicant's decision to pursue a career in counseling (e.g., rationale for seeking degree, commitment to counseling as a profession). The personal statement should also address such topics as the applicant's skills or knowledge, preparation through education and/or experience, strengths and weaknesses, rationale for academic deficiencies, etc.
- A professional résumé.
- Three letters of recommendation, at least one of which must address the applicant's academic potential (i.e. from a university faculty member).

To be consistent with national training standards and to ensure sufficient faculty members to advise and mentor students, a limited number of applicants will be admitted into the program each year. As a result, admission is competitive. Applicants who pass the initial screening are required to interview with an admissions committee. For more information or to ask questions, contact:

Dr. Leslie Neyland-Brown
Program Coordinator
Leslie.Neyland@utoledo.edu
419.530.6125

- MA in Counselor Education, Concentration in School Counseling
- MA in Counselor Education, Concentration In Clinical Mental Health

MA- Counselor Education (School Counseling Concentration)

Code	Title	Hours
COUN 5010	Professional Orientation To School Counseling	4
COUN 5110	Career Counseling And Development	3
COUN 5120	Individual And Group Assessment	3
COUN 5130	Group Counseling	4
COUN 5140	Counseling Theories and Application	4
COUN 5150	Counseling Across The Life Span	3
COUN 5160	Cultural Diversity For Counselors And School Psychologists	3
COUN 5180	Counseling Skills	4
COUN 5190	Counseling Practicum	4

COUN 6000	Counseling Research and Program Evaluation	3
COUN 6100	Comprehensive School Counseling Programs	4
COUN 6220	Child, Adolescent, Family Therapy	3
COUN 6230	Crisis Intervention Counseling	3
COUN 6940	Counseling Internship	1-8
COUN 6240	Diagnosis And Mental Health	4
or SPSY 6260	Developmental Child Psychopathology	
SPED 5000	Issues In Special Education	3
or SPSY 5040	Legal And Ethical Issues For School Psychologists And Counselors	

Combined bachelor's to master's: Psychology, BA to Counselor Education, MA

Undergraduate students accepted in the University of Toledo's Bachelor's in Psychology program will be admitted to the University of Toledo's Counselor Education Master's program and allowed to complete up to two graduate level classes (eight credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in the Counselor Education Master's program upon completion of the undergraduate degree requirements. The graduate coursework (up to eight hours) may be applied to completion of both undergraduate and Counselor Education Master's program degree requirements. It will be the joint responsibility of the faculty and administrators in Bachelor's in Psychology program and Counselor Education Master's program to supervise students admitted to the early admission/bridge program option, to ensure that the limit of eight hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) COUN 5140 and COUN 5180 may be included in the approved eight semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

MA- Counselor Education (Clinical Mental Health Concentration)

Code	Title	Hours
COUN 5020	Professional Orientation to Clinical Mental Health Counseling	4
COUN 5110	Career Counseling And Development	3
COUN 5120	Individual And Group Assessment	3
COUN 5130	Group Counseling	4
COUN 5140	Counseling Theories and Application	4
COUN 5150	Counseling Across The Life Span	3
COUN 5160	Cultural Diversity For Counselors And School Psychologists	3
COUN 5180	Counseling Skills	4
COUN 5190	Counseling Practicum	4
COUN 6000	Counseling Research and Program Evaluation	3
COUN 6200	Advanced Counseling Skills	3
COUN 6230	Crisis Intervention Counseling	3
COUN 6240	Diagnosis And Mental Health	4
COUN 6940	Counseling Internship	1-8
COUN 5600	Psychopathology: Conceptualizations and Assessment	4
COUN 6220	Child, Adolescent, Family Therapy	3
or COUN 8460	Substance Abuse Counseling	

Combined bachelor's to master's: Psychology, BA to Counselor Education, MA

Undergraduate students accepted in the University of Toledo's Bachelor's in Psychology program will be admitted to the University of Toledo's Counselor Education Master's program and allowed to complete up to two graduate level classes (eight credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in the Counselor Education Master's program upon completion of the undergraduate degree requirements. The graduate coursework (up to eight hours) may be applied to completion of both undergraduate and Counselor Education Master's program degree requirements. It will be the joint responsibility of the faculty and administrators in Bachelor's in Psychology program and Counselor Education Master's program to supervise students admitted to the early admission/bridge program option, to ensure that the limit of eight hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) COUN 5140 and COUN 5180 may be included in the approved eight semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

- Students will describe and demonstrate the multiple roles, responsibilities and functions of a professional counselor consistent with the ethical, legal and professional standards endorsed by the profession
- Students will apply developmentally relevant, culturally sustaining, and growth promoting theories, skills, interventions and practices across individual and group counseling modalities.
- Students will apply skills necessary to design and evaluate a comprehensive school counseling program that promotes the academic, personal, social and career success of students in K-12 settings.
- Students will analyze and evaluate the evidence base for effective, ethical, and culturally sustaining counseling theories, interventions, practices, and programs using current research in counseling.

Master of Arts in School Psychology

The program is approved by the National Association of School Psychologists and accredited by the Council for the Accreditation of Educator Preparation. Both the masters of arts and the education specialist degree requirements must be completed by the student to be licensed as a school psychologist in Ohio and to be a nationally certified school psychologist.

The M.A. program is designed for one year of full-time study.

Application deadlines for the school psychology M.A. program are December 1 and February 1.

To apply to the program, applicants must meet the minimum academic prerequisites and submit the following materials:

- Minimum academic prerequisite: Undergraduate GPA of 2.7 (for admission to the College of Graduate Studies) and for the school psychology program, a preferred undergraduate GPA of 3.0.
- College of Graduate Studies application for the master's degree in school psychology.
- Three letters of recommendation, at least one of which must address the applicant's academic potential (i.e. from a university faculty member).
- Statement of purpose, between two to three pages, that details the reasons the applicant would like to pursue a career in school psychology and includes personal experiences. The statement of purpose should be typed and submitted to the College of Graduate Studies as a separate word document.
- Official undergraduate transcripts (and graduate transcripts, if applicable).
- Professional résumé.

To be consistent with national training standards and to ensure sufficient faculty members to advise and mentor students, a limited number of applicants will be admitted into the program each year. As a result, admission is competitive. Applicants are required to interview with an admissions committee. Prior to participating in the campus interview, applicants must interview a school psychologist. For more information or to ask questions, contact:

Jennifer Reynolds
Program Director and Chair
jennifer.reynolds21@utoledo.edu
419-530-4301

Code	Title	Hours
SPSY 5030	Role And Function Of The School Psychologist	3
SPSY 5060	Prepractica in School Psychology Course is taken in fall (2 credits) and spring (2 credits).	2
SPSY 5170	Consultation I: Theories And Techniques	3
SPSY 5300	Psychoeducational Assessment And Interventions I	4
SPSY 5310	Psychoeducational Assessment And Interventions II	4
SPSY 6300	Behavior Analysis for School Psychologists	3
SPSY 5040	Legal And Ethical Issues For School Psychologists And Counselors	4
SPSY 5320	Psychoeducational Assessment And Interventions III	4
HSHS 6000	Statistics and Research for Health Science and Human Service Professions	3

Combined bachelor's to master's - Psychology, BA to School Psychology, MA Pipeline Program

Undergraduate students accepted to the Combined bachelor's to master's - Psychology, BA to School Psychology, MA Pipeline Program option will be admitted to the HH-CSPS-MA: School Psychology, MA program and be allowed to complete up to three graduate level classes (nine credit hours) during their final academic year of undergraduate studies. The graduate credits cannot come from any psychology major requirements or electives but rather from the related field electives (i.e., non-psychology credits). Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) SPSY 5030, SPSY 6300, SPSY 5040, SPSY 6260, COUN 5160, HSHS 6000, and COUN 5140 may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

The complete program, including the MA and EdS, includes approximately 78 credit hours, a two-semester pre-practica experience during the first year, a two-semester practica experience during the second year, and a 9-month, full-time internship (minimum of 1200 clock hours) in a school setting completed during the third year. Students earn a master of arts (M.A.) after completing a minimum of 32 hours of coursework and 100 pre-practica experience hours. The education specialist (Ed.S.) degree is earned after completion of the remaining coursework, practica experience and internship.

First Year		
First Term		**Hours**
SPSY 5030	Role And Function Of The School Psychologist	3
SPSY 5060	Prepractica in School Psychology	2
SPSY 5300	Psychoeducational Assessment And Interventions I	4

SPSY 6300	Behavior Analysis for School Psychologists	3
	Hours	**12**
Second Term		
SPSY 5310	Psychoeducational Assessment And Interventions II	4
SPSY 5060	Prepractica in School Psychology	2
SPSY 5040	Legal And Ethical Issues For School Psychologists And Counselors	4
SPSY 5170	Consultation I: Theories And Techniques	3
	Hours	**13**
Third Term		
SPSY 5320	Psychoeducational Assessment And Interventions III	4
HSHS 6000 Statistics and Research for Health Science and Human Service Professions		3
	Hours	**7**
	Total Hours	**32**

- PLO 1.1 (2021) Understands and is sensitive to individual differences, abilities, disabilities, and other diverse characteristics as evidenced in oral and written communication and interpersonal relationships (NASP 2.2, 2.8).
- PLO 1.2 (2021) Recognizes and addresses diversity and ecological factors when selecting, administering, and interpreting assessments; and designing, implementing, and evaluating interventions for learning and/or mental and behavioral health concerns (NASP 2.8).
- PLO 1.3 (2021) Understands and respects diversity factors related to family systems, strengths, needs, and cultures; and recognizes equitable practices and advocacy for social justice are foundational to effective service delivery (NASP 2.7, 2.8).
- PLO 1.4 (2021) Actively and attentively listens, communicates, and collaborates effectively with others in activities such as meetings, supervision sessions, parent interviews, and consultations (NASP 2.2).
- PLO 1.5 (2021) Promotes and facilitates family, school, and community partnerships and interactions to enhance learning and social-emotional and behavior outcomes for children (NASP 2.7).
- PLO 2.1 (2021) Selects, administers, and interprets results of academic and cognitive assessments (NASP 2.1).
- PLO 2.2 (2021) Communicates results of academic and cognitive assessments and collaboratively works with others to identify interventions to enhance learning and academic outcomes (NASP 2.2, 2.3).
- PLO 2.3 (2021) Use a systematic problem-solving process to develop, implement, monitor progress, and evaluate academic interventions (NASP 2.1, 2.3).
- PLO 2.4 (2021) Considers ecological factors (e.g., classroom, family, and community characteristics) and respects diversity in learning as a context for academic assessment and intervention (NASP 2.2, 2.3, 2.8).
- PLO 2.5 (2021) Advocates for equality (all children have same access to educational opportunities) and equity (each student receives what they need to benefit from educational opportunities) in evidenced based curricula and instructional strategies for all students (NASP 2.3, 2.8).
- PLO 3.2 (2021) Communicates results of assessments and collaboratively works with others to identify interventions to enhance social-emotional and behavior, and mental health (NASP 2.2, 2.4).
- PLO 3.3 (2021) Implements a problem-solving process and exercises data-based decision making to identify, develop, implement, monitor, and evaluate intensive social-emotional and behavior, and mental health interventions (NASP 2.1, 2.4).
- PLO 3.4 (2021) Considers ecological, biological, cultural, developmental, and social influences on mental and behavioral health and implications for classroom management and instruction (NASP 2.2, 2.4, 2.8).
- PLO 3.5 (2021) PLO 3.5 (2021) Applies concepts from applied behavior analysis, and conducts functional assessments and analysis to develop behavior intervention plans (NASP 2.4).
- PLO 4.1 (2021) Understands research on system and organization change including team processes and group dynamics; collaborates with others to develop effective services and programs for school improvement (NASP 2.5, 2.9).
- PLO 4.5 (2021) Consumes and applies research related to positive behavior intervention support to promote equity in learning and universal positive behavior, and mental health for all students (NASP 2.5, 2.8, 2.9).
- PLO 5.1 (2021) Provides services consistent with ethical and legal policies and procedures and uses satisfactory professional judgment and decision making (NASP 2.10).
- PLO 5.2 (2021) Uses technology in assessment, intervention, and presentation of information (NASP 2.9, 2.10).
- PLO 5.5 (2021) Uses professional skills needed for effective practice including social justice advocacy, communication and interpersonal skills with peers, trainers, and supervisors, and demonstrates satisfactory initiative, dependability, time management and organizational skills (NASP 2.8, 2.10).
- PLO 4.4 (2021) Consumes and applies research related to social–emotional well-being, resilience and risk factors in learning and uses implementation science to plan, evaluate and sustain evidence-based strategies to promote multitiered prevention and safe, supportive schools (NASP 2.5, 2.6, 2.9).
- PLO 5.3 (2021) Functions as scientist-practitioner by designing, conducting, and interpreting single case and small group research and analyzing outcomes to inform practices and services (NASP 2.9).

Master of Social Work (MSW)

The master of social work program (https://www.utoledo.edu/hhs/socialwork/gradprogram/) has a strong emphasis on social and economic justice. As such, the degree has an advanced generalist concentration, preparing students to create change through ethical use of evidence-based practices at all system levels, from individuals to communities. Students may select a focus on either mental health or child and family practice.

The 33-credit Advanced Standing Program is for applicants with an undergraduate social work degree from a social work program accredited by the Council on Social Work Education (CSWE). The 60-credit Regular Program is for applicants with an undergraduate degree in another

field. Both programs include coursework and supervised practicum placement(s). Most classes are face-to-face and are primarily scheduled in evenings/weekends. Students may attend on a full-time or part-time basis.

We assist student in getting practicum placements in areas such as health care, social services, mental health, nonprofit agencies, and other nontraditional placements. While every effort is made to accommodate students with full-time jobs, applicants must be aware that field practicum placements primarily take place during business hours on weekdays. We are unable to guarantee night or weekend placements. However, completing a practicum placement at the student's workplace may be possible under certain conditions.

The MSW program is accredited by the Council on Social Work Education. For additional information, see the MSW program (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fhhs%2Fsocialwork%2Fgradprogram%2F&data=05%7C02%7CJohn.Laux%40UToledo.Edu%7Ce1288903650345c6738108dc442ad5a2%7C1d6b1707baa94a3da8f8deabfb3d467b%7C0%7C0%7C638460197959428334%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=tBjNTteOYD22cbTyb8THZU%2FwmDjj%2Fh5xr9F0bUqREbk%3D&reserved=0) main web page.

Minimum requirements to apply for the MSW program (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fhhs%2Fsocialwork%2Fgradprogram%2F&data=05%7C02%7CJohn.Laux%40UToledo.Edu%7Ce1288903650345c6738108dc442ad5a2%7C1d6b1707baa94a3da8f8deabfb3d467b%7C0%7C0%7C638460197959442649%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C%7C&sdata=bvzqlvSejlioSqvVAKRnUifrYTW415YoSqlkrptab5A%3D&reserved=0) include:

- An earned an undergraduate degree (in social work if applying for Advanced Standing program; in any other field if applying for Regular Program)
- 2.7 or higher cumulative grade point average on a 4.0 scale (or submit GRE taken within past five years with scores at 29th or higher percentile), and
- Completed classes in three of the following areas: psychology, sociology, political science, human biology, statistics, or economics.

In addition to the admission criteria established by the College of Graduate Studies at The University of Toledo, applicants to the MSW program (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fhhs%2Fsocialwork%2Fgradprogram%2F&data=05%7C02%7CJohn.Laux%40UToledo.Edu%7Ce1288903650345c6738108dc442ad5a2%7C1d6b1707baa94a3da8f8deabfb3d467b%7C0%7C0%7C638460197959442649%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C%7C&sdata=bvzqlvSejlioSqvVAKRnUifrYTW415YoSqlkrptab5A%3D&reserved=0) must submit

- Personal Statement of up to 1000 words, addressing the following topics:
  - Factors that influenced your decision to become a social worker and pursue an advanced degree. How will this degree help you achieve your professional goals?
  - A pressing social and economic justice issue, what makes this issue particularly salient, and ways you might address it as a masters-level social worker.
  - Your experience in the area of social and economic justice, and any of your goals in this area beyond those addressed in the first bullet point.
  - Accomplishments you believe are relevant, including ways in which you have demonstrated leadership in areas such as employment, volunteerism, Peace Corps/AmeriCorps/VISTA, and/or military service.
- Resume/CV
- Three recommendations from people who know you in academic and/or professional settings
- Official transcripts from all colleges/universities attended except the University of Toledo

Prospective applicants are urged to review information on the program website (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fhhs%2Fsocialwork%2Fgradprogram_application_packet.html&data=05%7C02%7CJohn.Laux%40UToledo.Edu%7Ce1288903650345c6738108dc442ad5a2%7C1d6b1707baa94a3da8f8deabfb3d4%7C0%7C0%7C638460197959456510%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLC%7C0%7C%7C%7C&sdata=YiXnHSmfaahuAniSZ0kMnwvH8qP8HrTaVgMi%2BTZrCu0%3D&reserved=0) for additional information and/or application requirements.

The personal statement and references from both employers and prior faculty members will be evaluated for a "fit" with the social work profession and our program's focus on social and economic justice. Applicants must convey their valuing of and adherence to the values and ethics of the profession. Applicants with no evidence of the above will not be admitted to the program.

The Council on Social Work Education does not permit programs to provide course credit for work experience. It is our hope that the student body of our program will include a mixture of students who have experience as well as those without extensive professional experience. We welcome diversity among applicants applying to the MSW program (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fhhs%2Fsocialwork%2Fgradprogram%2F&data=05%7C02%7CJohn.Laux%40UToledo.Edu%7Ce1288903650345c6738108dc442ad5a2%7C1d6b1707baa94a3da8f8deabfb3d4%7C0%7C0%7C638460197959463362%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLC%7C0%7C%7C%7C&sdata=A4w0DSzj5VUy%2Bxyn%2FupvmdX7hJvW3lz5bJdNrH4hqCc%3D&reserved=0). This includes diversity of gender, age, race/ethnicity, sexual orientation, ability and experience in the profession, etc.

The MSW Program (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fhhs%2Fsocialwork%2Fgradprogram%2F&data=05%7C02%7CJohn.Laux%40UToledo.Edu%7Ce1288903650345c6738108dc442ad5a2%7C1d6b1707baa94a3da8f8deabfb3d4

%7C0%7C0%7C638460197959463362%7CUnknown
%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D
%7C0%7C%7C%7C%7C&sdata=A4w0DSzj5VUy%2Bxyn
%2FupvmdX7hJvW3lz5bJdNrH4hqCc%3D&reserved=0) requires that students admitted to the Regular MSW PRogram complete 60 credit hours for graduation, which is consistent with MSW programs across the country. Foundation (5000 level) course work is offered in the first year of the program and advanced (6000 level) course work in the second year.

Students must enroll in 16 credit hours of field education to obtain the minimum required by CSWE. Six (6) of these credit hours are taken during the foundation year and ten (10) credit hours during the advanced year. While every effort is made to accommodate students with full-time jobs, applicants to the program must be aware that field placements primarily take place during business hours and on week days. We are unable to guarantee a night or weekend field placement.

Students who are admitted to the Advanced Standing MSW Program must complete 33 credit hours to obtain the MSW degree. The Advanced Standing Program focuses on advanced generalist and specialty courses and field placements. Only courses at the 6000 level are required for the advanced standing program.

Regular MSW Program students are required to complete 60 credit hours (Foundation year, 27 credit hours are listed below, in the Advanced year students are required to take the 33 credit hours listed below the advanced standing section).

Code	Title	Hours
SOCW 5010	Social Work Research Methods And Analysis	3
SOCW 5110	Social Work Practice I	3
SOCW 5120	Social Work Practice II	3
SOCW 5130	Social Work Practice III	3
SOCW 5210	Micro Social Work Perspectives In Human Behavior And The Social Environment	3
SOCW 5220	Macro Social Work Perspectives In Human Behavior And The Social Environment	3
SOCW 5330	Policy Issues And Analysis In Social Work	3
SOCW 5900	Foundation Field Experience and Integrative Seminar I	3
SOCW 5910	Foundation Field Experience and Integrative Seminar II	3
Total Hours		**27**

Advanced standing students are required to complete 33 credit hours.

Code	Title	Hours
SOCW 6030	Research Methods For Macro Social Work Practice	3
or SOCW 6040	Research Methods For Micro Social Work Practice	
SOCW 6110	Advanced Generalist Practice I	3
SOCW 6120	Advanced Generalist Practice II	3
SOCW 6130	Advanced Generalist Practice III	3
SOCW 6140	Advanced Social Work Assessment	3
SOCW 6200	Disparities, Diversity and Social Justice	2
SOCW 6410	Social Work Micro Practice with Children and Families	3
or SOCW 6510	Social Work Micro Practice in Mental Health	
SOCW 6430	Social Work Macro Practice involving Children and Families	3
or SOCW 6530	Social Work Macro Practice in Mental Health	
SOCW 6900	ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR I	5
SOCW 6910	ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR II	5
Total Hours		**33**

- PLO Competency 1: Demonstrate Ethical and Professional Behavior
- PLO Competency 2: Advance Human Rights and Social, Economic, and Environmental Justice
- PLO Competency 3: Engage Anti-Racism, Diversity, Equity, and Inclusion (ADEI) in Practice
- PLO Competency 4: Engage in Practice-informed Research and Research-informed Practice
- PLO Competency 5: Engage in Policy Practice
- PLO Competency 6: Engage with Individuals, Families, Groups, Organizations, and Communities
- PLO Competency 7: Assess Individuals, Families, Groups, Organizations, and Communities
- PLO Competency 8: Intervene with Individuals, Families, Groups, Organizations, and Communities
- PLO Competency 9: Evaluate Practice with Individuals, Families, Groups, Organizations, and Communities

Education Specialist in School Psychology

The graduate program in school psychology meets the education requirements for licensure in Ohio and many other states. The program is approved by the National Association of School Psychologists and accredited by the Council for the Accreditation of Educator Preparation. Both the master of arts and the education specialist degree requirements must be completed by the student to be licensed as a school psychologist in Ohio and to be a nationally certified school psychologist.

The Ed.S. program is designed for three years of full-time study.

Application deadline for the school psychology program is February 15.

To apply to the program, applicants must meet the minimum academic prerequisite and submit the following materials:

- For students who completed their MA in school psychology at the University of Toledo and are applying to continue in the Ed.S. degree program, they only need to submit the College of Graduate Studies application for the Ed.S. degree in school psychology.

For students who have completed their MA degree at another institution, if approved by the program director, they may apply for admission to the Ed.S. degree program. Students will be required to submit the following:

- Three letters of recommendation, at least one of which must address the applicant's academic potential (i.e., from a university faculty member).
- Statement of purpose, between two to three pages, that details the reasons the applicant would like to pursue a career in school psychology and includes personal experiences. The statement of purpose should be typed and submitted to the College of Graduate Studies as a separate Word document.
- Official undergraduate transcripts and graduate transcripts, if applicable.
- Professional résumé.

To be consistent with national training standards and to ensure sufficient faculty members to advise and mentor students, a limited number of applicants will be admitted into the program each year. As a result, admission is competitive. For more information or to ask questions, contact:

Jennifer L. Reynolds
jennifer.reynolds21@utoledo.edu
419-530-4301

Code	Title	Hours
SPSY 7180	Consultation II: School and Home Collaboration	3
SPSY 7190	Consultation III:School and Community	4
SPSY 7350	Psychoeducational Assessment and Interventions IV	4
SPSY 7330	Practica in School Psychology Students take 4 credits in fall and 4 credits in spring	8
COUN 7140	Counseling Theories and Application	4
SPSY 7940	Internship In School Psychology	16
COUN 7160	Cultural Diversity For Counselors And School Psychologists	3
SPSY 7260	Developmental Child Psychopathology	3 or 4
Total Hours		**45-46**

The complete program, including the MA and EdS, includes approximately 78 credit hours, a two-semester pre-practica experience during the first year, a two-semester practica experience during the second year, and a 9-month, full-time internship (minimum of 1200 clock hours) in a school setting completed during the third year. Students earn a master of arts (MA) after completing a minimum of 30 hours of coursework and 100 pre-practica experience hours. The education specialist (EdS) degree is earned after completion of the remaining coursework, practica experience and internship.

First Year		
First Term		**Hours**
SPSY 7330	Practica in School Psychology	4
SPSY 7350	Psychoeducational Assessment and Interventions IV	4
SPSY 7190	Consultation III:School and Community	4
	Hours	**12**
Second Term		
SPSY 7330	Practica in School Psychology	4
SPSY 7180	Consultation II: School and Home Collaboration	3
COUN 7140	Counseling Theories and Application	4
	Hours	**11**
Third Term		
SPSY 7260	Developmental Child Psychopathology	3 or 4
COUN 7160	Cultural Diversity For Counselors And School Psychologists	3
	Hours	**6-7**
Second Year		
First Term		
SPSY 7940	Internship In School Psychology	6
	Hours	**6**
Second Term		
SPSY 7940	Internship In School Psychology	5
	Hours	**5**
Third Term		
SPSY 7940	Internship In School Psychology	5
	Hours	**5**
	Total Hours	**45-46**

- PLO 1.1 (2021) Understands and is sensitive to individual differences, abilities, disabilities, and other diverse characteristics as evidenced in oral and written communication and interpersonal relationships (NASP 2.2, 2.8).
- PLO 1.2 (2021) Recognizes and addresses diversity and ecological factors when selecting, administering, and interpreting assessments; and designing, implementing, and evaluating interventions for learning and/or mental and behavioral health concerns (NASP 2.8).
- PLO 1.3 (2021) Understands and respects diversity factors related to family systems, strengths, needs, and cultures; and recognizes equitable practices and advocacy for social justice are foundational to effective service delivery (NASP 2.7, 2.8).
- PLO 1.4 (2021) Actively and attentively listens, communicates, and collaborates effectively with others in activities such as meetings, supervision sessions, parent interviews, and consultations (NASP 2.2).
- PLO 1.5 (2021) Promotes and facilitates family, school, and community partnerships and interactions to enhance learning and social-emotional and behavior outcomes for children (NASP 2.7).
- PLO 2.1 (2021) Selects, administers, and interprets results of academic and cognitive assessments (NASP 2.1).
- PLO 2.2 (2021) Communicates results of academic and cognitive assessments and collaboratively works with others to identify interventions to enhance learning and academic outcomes (NASP 2.2, 2.3).
- PLO 2.3 (2021) Use a systematic problem-solving process to develop, implement, monitor progress, and evaluate academic interventions (NASP 2.1, 2.3).
- PLO 2.4 (2021) Considers ecological factors (e.g., classroom, family, and community characteristics) and respects diversity in learning as

a context for academic assessment and intervention (NASP 2.2, 2.3, 2.8).

- PLO 2.5 (2021) Advocates for equality (all children have same access to educational opportunities) and equity (each student receives what they need to benefit from educational opportunities) in evidenced based curricula and instructional strategies for all students (NASP 2.3, 2.8).
- PLO 3.1 (2021) Selects, administers, and interprets results of multiple methods of social-emotional and behavior, and mental health assessment (NASP 2.1, 2.4).
- PLO 3.2 (2021) Communicates results of assessments and collaboratively works with others to identify interventions to enhance social-emotional and behavior, and mental health (NASP 2.2, 2.4).
- PLO 3.3 (2021) Implements a problem-solving process and exercises data-based decision making to identify, develop, implement, monitor, and evaluate intensive social-emotional and behavior, and mental health interventions (NASP 2.1, 2.4).
- PLO 3.4 (2021) Considers ecological, biological, cultural, developmental, and social influences on mental and behavioral health and implications for classroom management and instruction (NASP 2.2, 2.4, 2.8).
- PLO 3.5 (2021) PLO 3.5 (2021) Applies concepts from applied behavior analysis, and conducts functional assessments and analysis to develop behavior intervention plans (NASP 2.4).
- PLO 4.1 (2021) Understands research on system and organization change including team processes and group dynamics; collaborates with others to develop effective services and programs for school improvement (NASP 2.5, 2.9).
- PLO 4.2 (2021) Assesses existing school policies and practices in areas such as MTSS, staff training, and family, school, and community collaboration, and uses principles of implementation science to plan, evaluate, and sustain universal interventions that create and maintain effective, supportive, and positive learning environments (NASP 2.5, 2.9).
- PLO 4.3 (2021) Uses and applies crisis research in effective prevention, protection, mitigation, response, and recovery to promote services that enhance psychological well-being and physical safety (NASP 2.6, 2.9).
- PLO 4.4 (2021) Consumes and applies research related to social–emotional well-being, resilience and risk factors in learning and uses implementation science to plan, evaluate and sustain evidence-based strategies to promote multitiered prevention and safe, supportive schools (NASP 2.5, 2.6, 2.9).
- PLO 4.5 (2021) Consumes and applies research related to positive behavior intervention support to promote equity in learning and universal positive behavior, and mental health for all students (NASP 2.5, 2.8, 2.9).
- PLO 5.1 (2021) Provides services consistent with ethical and legal policies and procedures and uses satisfactory professional judgment and decision making (NASP 2.10).
- PLO 5.2 (2021) Uses technology in assessment, intervention, and presentation of information (NASP 2.9, 2.10).
- PLO 5.3 (2021) Functions as scientist-practitioner by designing, conducting, and interpreting single case and small group research and analyzing outcomes to inform practices and services (NASP 2.9).
- PLO 5.4 (2021) Engages in activities that foster professional identity through membership involvement in and attendance at regional, state and national conferences (NASP 2.10).
- PLO 5.5 (2021) Uses professional skills needed for effective practice including social justice advocacy, communication and interpersonal skills with peers, trainers, and supervisors, and demonstrates satisfactory initiative, dependability, time management and organizational skills (NASP 2.8, 2.10).

Graduate Certificate in Clinical Mental Health Counseling

Code	Title	Hours
COUN 5020	Professional Orientation to Clinical Mental Health Counseling	4
COUN 6200	Advanced Counseling Skills	3
COUN 6240	Diagnosis And Mental Health	4
COUN 6940	Counseling Internship	8
COUN 5600	Psychopathology: Conceptualizations and Assessment	4
Total Hours		**23**

First Term		Hours
COUN 5020	Professional Orientation to Clinical Mental Health Counseling	4
COUN 6240	Diagnosis And Mental Health	4
	Hours	**8**
Second Term		
COUN 5600	Psychopathology: Conceptualizations and Assessment	4
COUN 6200	Advanced Counseling Skills	3
	Hours	**7**
Third Term		
COUN 6940	Counseling Internship	8
	Hours	**8**
	Total Hours	**23**

- PLO 1. F.1.a. history and philosophy of the counseling profession and its specialty areas;
- PLO 2. F.1.b. the multiple professional roles and functions of counselors across specialty areas, and their relationships with human service and integrated behavioral health care systems, including interagency and interorganizational collaboration and consultation;
- PLO 3. F.1.c. counselors' roles and responsibilities as members of interdisciplinary community outreach and emergency management response team;
- PLO 4. F.1.d. the role and process of the professional counselor advocating on behalf of the profession;
- PLO 5. F.1.f. professional counseling organizations, including membership benefits, activities, services to members, and current issues;

- PLO 6. F.1.g. professional counseling credentialing, including certification, licensure, and accreditation practices and standards, and the effects of public policy on these issues;
- PLO 7. F.1.h. current labor market information relevant to opportunities for practice within the counseling profession;
- PLO 8. F.1.i. ethical standards of professional counseling organizations and credentialing bodies, and applications of ethical and legal considerations in professional counseling;
- PLO 9. F.1.j. technology's impact on the counseling profession
- PLO 10. F.1.k. strategies for personal and professional self-evaluation and implications for practice;
- PLO 11. F.1.l. self-care strategies appropriate to the counselor role;
- PLO 12. F.1.m. the role of counseling supervision in the profession
- PLO 13. F.3.c. theories of normal and abnormal personality development;
- PLO 14. F.3.d. theories and etiology of addictions and addictive behaviors;
- PLO 15. F.3.h. a general framework for understanding differing abilities and strategies for differentiated interventions;
- PLO 16. F.5.c. theories, models, and strategies for understanding and practicing consultation;
- PLO 17. F.5.d. ethical and culturally relevant strategies for establishing and maintaining in-person and technology-assisted relationships;
- PLO 18. F.5.e. the impact of technology on the counseling process;
- PLO 19. F.5.h. developmentally relevant counseling treatment or intervention plans;
- PLO 20. C.1.a. history and development of clinical mental health counseling;
- PLO 21. C.1.c principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning;
- PLO 22. C.1.d. neurobiological and medical foundation and etiology of addiction and co-occurring disorders;
- PLO 23. C.1.e. psychological tests and assessments specific to clinical mental health counseling.
- PLO 24. C.2.a. roles and settings of clinical mental health counselors;
- PLO 25. C.2.b. etiology, nomenclature, treatment, referral, and prevention of mental and emotional disorders;
- PLO 26. C.2.c. mental health service delivery modalities within the continuum of care, such as inpatient, outpatient, partial treatment and aftercare, and the mental health counseling services networks;
- PLO 27. C.2.d. diagnostic process, including differential diagnosis and the use of current diagnostic classification systems, including the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases (ICD);
- PLO 28. C.2.e. potential for substance use disorders to mimic and/or co-occur with a variety of neurological, medical, and psychological disorders;
- PLO 29. C.2.f. impact of crisis and trauma on individuals with mental health diagnoses;
- PLO 30. C.2.g. impact of biological and neurological mechanisms on mental health;
- PLO 31. C.2.h. classifications, indications, and contraindications of commonly prescribed psychopharmacological medications for appropriate medical referral and consultation;
- PLO 32. C.2.i. legislation and government policy relevant to clinical mental health counseling;
- PLO 33. C.2.j. cultural factors relevant to clinical mental health counseling;
- PLO 34. C.2.k. professional organizations, preparation standards, and credentials relevant to the practice of clinical mental health counseling;
- PLO 35. C.2.l. legal and ethical considerations specific to clinical mental health counseling;
- PLO 36. C.2.m. record keeping, third party reimbursement, and other practice and management issues in clinical mental health counseling.
- PLO 37. C.3.a. intake interview, mental status evaluation, biopsychosocial history, mental health history, and psychological assessment for treatment planning and caseload management;
- PLO 38. C.3.b. techniques and interventions for prevention and treatment of a broad range of mental health issues;
- PLO 39. C.3.c. strategies for interfacing with the legal system regarding court-referred clients
- PLO 40. C.3.d. strategies for interfacing with integrated behavioral health care professionals;
- PLO 41. C.3.e. strategies to advocate for persons with mental health issues.

Graduate Certificate in School Counseling

Code	Title	Hours
COUN 5010	Professional Orientation To School Counseling	4
COUN 6100	Comprehensive School Counseling Programs	4
COUN 6940	Counseling Internship	8
SPED 5000	Issues In Special Education	3
Total Hours		**19**

First Term		Hours
COUN 5010	Professional Orientation To School Counseling	4
SPED 5000	Issues In Special Education	3
	Hours	**7**
Second Term		
COUN 6100	Comprehensive School Counseling Programs	4
COUN 6940	Counseling Internship	8
	Hours	**12**
	Total Hours	**19**

- PLO 1. F.1.a. history and philosophy of the counseling profession and its specialty areas;
- PLO 2. F.1.b. the multiple professional roles and functions of counselors across specialty areas, and their relationships with human

service and integrated behavioral health care systems, including interagency and interorganizational collaboration and consultation;
- PLO 3. F.1.c. counselors' roles and responsibilities as members of interdisciplinary community outreach and emergency management response team;
- PLO 4. F.1.d. the role and process of the professional counselor advocating on behalf of the profession;
- PLO 5. F.1.f. professional counseling organizations, including membership benefits, activities, services to members, and current issues;
- PLO 6. F.1.g. professional counseling credentialing, including certification, licensure, and accreditation practices and standards, and the effects of public policy on these issues;
- PLO 7. F.1.h. current labor market information relevant to opportunities for practice within the counseling profession;
- PLO 8. F.1.i. ethical standards of professional counseling organizations and credentialing bodies, and applications of ethical and legal considerations in professional counseling;
- PLO 9. F.1.j. technology's impact on the counseling profession
- PLO 10. F.1.k. strategies for personal and professional self-evaluation and implications for practice;
- PLO 11. F.1.l. self-care strategies appropriate to the counselor role;
- PLO 12. F.5.c. theories, models, and strategies for understanding and practicing consultation;
- PLO 13. F.5.e. the impact of technology on the counseling process;
- PLO 14. G.1.a. history and development of school counseling;
- PLO 15. G.1.b. models of school counseling programs;
- PLO 16. G.1.d. models of school-based collaboration and consultation;
- PLO 17. G.1.e. assessments specific to P-12 education.
- PLO 18. G.2.a. school counselor roles as leaders, advocates, and systems change agents in P-12 schools;
- PLO 19. G.2.b. school counselor roles in consultation with families, P-12 and postsecondary school personnel, and community agencies
- PLO 20. G.2.c. school counselor roles in relation to college and career readiness;
- PLO 21. G.2.d. school counselor roles in school leadership and multidisciplinary teams;
- PLO 22. G.2.f. competencies to advocate for school counseling roles;
- PLO 23. G.2.h. common medications that affect learning, behavior, and mood in children and adolescents;
- PLO 24. G.2.i. signs and symptoms of substance abuse in children and adolescents as well as the signs and symptoms of living in a home where substance use occurs;
- PLO 25. G.2.j. qualities and styles of effective leadership in schools;
- PLO 26. G.2.l. professional organizations, preparation standards, and credentials relevant to the practice of school counseling;
- PLO 27. G.2.m. legislation and government policy relevant to school counseling;
- PLO 28. G.2.n. legal and ethical considerations specific to school counseling.
- PLO 29. G.3.a. development of school counseling program mission statements and objectives;
- PLO 30. G.3.b. design and evaluation of school counseling programs;
- PLO 31. G.3.c. core curriculum design, lesson plan development, classroom management strategies, and differentiated instructional strategies;
- PLO 32. G.3.d. interventions to promote academic development;
- PLO 33. G.3.g. strategies to facilitate school and postsecondary transitions;
- PLO 34. G.3.i. approaches to increase promotion and graduation rates;
- PLO 35. G.3.j. interventions to promote college and career readiness;
- PLO 36. G.3.k. strategies to promote equity in student achievement and college access;
- PLO 37. G.3.l. techniques to foster collaboration and teamwork within schools;
- PLO 38. G.3.m. strategies for implementing and coordinating peer intervention programs;
- PLO 39. G.3.n. use of accountability data to inform decision making;
- PLO 40. G.3.o. use of data to advocate for programs and students.

Department of Population Health

JOSEPH DAKE, chair

The Department of Population Health offers a variety of degree options and graduate courses. In health, a master of public health with a specialization in health promotion and education is available as well as a masters of science in occupational health.

Degrees Offered

- Master of Public Health: Environmental and Occupational Health Concentration (p. 115)
- Master of Public Health: Generalist Concentration (p. 117)
- Master of Public Health: Health Promotion and Education Concentration (p. 119)
- Master of Public Health: Public Health Epidemiology Concentration (p. 120)
- MS in Occupational Health (p. 122)
- Graduate Certificate in Biostatistics and Epidemiology (p. 123)
- Graduate Certificate in Epidemiology (p. 124)
- Graduate Certificate in Public Health Emergency Response (p. 124)
- Graduate Certificate in Occupational Health (p. 125)

PUBH 5020 Occupational Health
[3 credit hours]
An introduction to principles applicable to anticipation, recognition, evaluation, and control of harmful agents along with the confirmation of the protection from risks. This includes an introduction to industrial hygiene instrumentation, occupational health programs and ethics. Includes a field component.
Term Offered: Fall

PUBH 5060 Occupational Safety
[3 credit hours]
An introduction to principles applicable to safety and health programs, administration, and controlling unsafe conditions/acts. Includes a field component.
Term Offered: Fall

PUBH 5160 Environmental Health
[3 credit hours]
An introduction to principles applicable to human disease associated with food, water, air and soil contamination in the environment. The chemical, physical, and biological factors in the environment that impact health, along with monitoring and control will be examined. Includes laboratory and field components.
Term Offered: Fall

PUBH 5260 Haz Mat and Emerg Response
[3 credit hours]
Scientific, regulatory and management principles applicable to characteristics, control, storage, transport and disposal of chemical, biological and radiological agents; disaster preparedness and emergency response; personal protective equipment and site assessment/ monitoring. Includes a field component.
Term Offered: Spring, Summer, Fall

PUBH 5310 Chemical Agents and Exposure Assessment
[3 credit hours]
Scientific and management principles applicable to the qualitative and quantitative evaluation of chemical agents associated with human diseases resulting from various occupational and environmental exposures. Review and application of the exposure assessment process including basic characterization, establishing exposure groups, and judging exposure profiles. Includes laboratory and field components.
Term Offered: Fall

PUBH 5410 Hazard Control
[3 credit hours]
Scientific and management principles of air contaminant modeling; control of indoor and outdoor (ambient) air pollution; operation of dilution and local exhaust ventilation systems; respiratory protective equipment and programs commonly used in the workplace. Includes a laboratory component.
Term Offered: Spring

PUBH 5560 Health, Safety, and Worker Well-being
[3 credit hours]
Presents concepts related to improving worker well-being -- or the ability of people to address normal stresses, work productively, and achieve their highest potential. Builds on foundational knowledge of hazard assessment and control and introduces students to the model of Total Worker Health® (TWH). Experts in safety and health from various industries provide application of course content including integration of health protection and promotion, virtual reality machine training, and safety metrics and management. Includes a field component.
Term Offered: Spring

PUBH 5620 Physical Agents
[3 credit hours]
Scientific, regulatory, and management principles applicable to the assessment and control of exposure to physical agents (noise, thermal stress, ionizing and non-ionizing radiation). Includes laboratory and field components.
Term Offered: Spring

PUBH 5700 Risk Assessment
[3 credit hours]
Scientific and management principles of human health risk assessment including hazard identification, toxicity assessment, exposure assessment, risk characterization and communication relative to public, environmental, and occupational health.
Term Offered: Summer

PUBH 5720 Exposure Assessment Strategies
[3 credit hours]
Exposure assessment is an integral part of occupational and environmental health. This course will focus on the statistics and methods needed to assess exposures in the workplace.
Prerequisites: PUBH 6000 with a minimum grade of D-
Term Offered: Spring

PUBH 6000 Quantitative and Qualitative Data Analysis in Public Health
[3 credit hours]
This course includes introductory content on both quantitative and qualitative methods and relevant data analyses. Quantitative: Statistical methods and principles necessary for understanding and interpreting data used in public health. Topics include descriptive statistics, statistical comparison groups, correlation, and regression. Includes a lab component using SPSS statistical package. Qualitative: Methods for gathering qualitative data and thematic analysis of data in health service research. Activities include analyzing data for emergent themes as well as interpreting and presenting findings.
Term Offered: Spring, Fall

PUBH 6001 Biostatistics for Medical Sciences
[3 credit hours]
An introduction to descriptive statistics including measurement of central tendency, dispersion, correlation and regression, hypothesis testing, and select nonparametric methods, including the use of statistical package(s).
Term Offered: Fall

PUBH 6010 Public Health Epidemiology
[3 credit hours]
The course will present principles of the epidemiology method including problem solving. Various study designs will be discussed, including prospective and retrospective studies, analytic, and experimental methods.
Term Offered: Spring, Fall

PUBH 6020 Management and Leadership in Public Health
[3 credit hours]
An introduction to the leadership and management principles necessary for the delivery of public health programs, intervention, and outreach, including fostering collaboration, effective communication, consensus building, negotiation, cultural awareness, budget and resource management, evaluation, coalition building, vision creation, mediation, empowering others, and guiding decision making.
Term Offered: Spring, Summer, Fall

PUBH 6030 Advanced Epidemiology
[3 credit hours]
This course covers principles and methods of epidemiology in depth. The topics include causal inference, risk and effect, confounding, interaction, randomization, and matching. Special emphasis is given to design and interpretation of epidemiological studies.
Term Offered: Spring, Summer

PUBH 6050 Concepts and Issues in Environmental Health
[3 credit hours]
The course will review environmental concepts, focusing on water, soil, food, and diseases as they pertain to public health. Emergency preparedness for environmental events will be discussed. The impact of environmental events on public health, preparations, and appropriate responses will be included. The relationship between environmental health and public health will be emphasized.
Term Offered: Spring, Summer, Fall

PUBH 6060 Advanced Biostatistics
[3 credit hours]
Advanced statistical techniques with particular emphasis on problems in public health. Multiple regression, methods of analysis of variance, categorical data analysis including logistic regression, non parametric and survival analysis. Problems whose solution involves using a statistical program (e.g., SPSS).
Term Offered: Spring, Fall

PUBH 6070 Genetic Epidemiology
[3 credit hours]
Introduces genetic epidemiology methods, principles of population genetics including linkage and association studies used in assessing familial aggregatio, and transmission patterns for identifying the genetic basis of common diseases.
Prerequisites: (PUBH 6000 with a minimum grade of C or PUBH 8000 with a minimum grade of C) and (PUBH 6010 with a minimum grade of C or PUBH 8010 with a minimum grade of C) or (PUBH 600 with a minimum grade of C or PUBH 800 with a minimum grade of C) and (PUBH 601 with a minimum grade of C or PUBH 801 with a minimum grade of C)
Term Offered: Summer

PUBH 6080 Social Determinants of Health
[3 credit hours]
Social determinants of health are social conditions, factors, and systems that place people from different socio-demographic and socioeconomic group (social class, gender, race/ethnicity, and place of birth) at differential risk of poor health and premature mortality. Mechanisms through which these factors are hypothesized to influence health, such as stress and access to health resources and constraints, will be discussed, as well as the ways in which these mechanisms can operate across the life course.
Term Offered: Spring, Fall

PUBH 6090 Issues in Public Health
[3 credit hours]
Examination of various contemporary issues in public health. Includes social, economic, political, and community problems in the provision of health services, health manpower, and payment for health care.

PUBH 6110 Categorical Data Analysis
[3 credit hours]
This course introduces the theory and application of methods for categorical data, with emphasis on biomedical and public health applications. Topics include contingency tables, log-linear, logistic regression and Raush models, multivariate methods for matched pairs and longitudinal data. The methods are illustrated with SAS and/or SPSS, R.
Term Offered: Spring, Summer, Fall

PUBH 6120 Epidemiology Infectious Diseas
[3 credit hours]
Provides an overview of major infectious diseases affecting public health in the U.S. and worldwide; introducing the basic epidemiologic methods for surveillance and investigation of infectious disease outbreaks.
Term Offered: Spring, Fall

PUBH 6130 Molecular Epidemiology
[3 credit hours]
The course focuses on the application of epidemiological techniques to the study of effects of occupational and environmental exposures.
Term Offered: Fall

PUBH 6150 Clinical Epidemiology
[3 credit hours]
This course focuses on epidemiologic concepts and methods in clinical medicine. Topics include clinical measurements and outcomes, risk, prognostic factors, clinical diagnosis, study design, decision analysis, clinical research and meta-analysis.
Term Offered: Spring, Fall

PUBH 6160 Reproductive Epidemiology
[3 credit hours]
Reproductive health issues from the pre-conception, prenatal delivery, and postnatal periods and emphasizes health issues affecting women, men, and infants. A focus on current research, controversial issues and methodological issues.
Prerequisites: PUBH 6010 with a minimum grade of D- or PUBH 601 with a minimum grade of D-
Term Offered: Spring

PUBH 6180 Cancer Epidemiology
[3 credit hours]
Focuses on a number of cancers, including the most incident cancers in the United States. Provides a broad overview of cancer epidemiology and basic substantive knowledge regarding many cancers and their risk factors, prevention, and biology and pathogenesis.
Term Offered: Spring, Summer, Fall

PUBH 6190 Statistical Packages for Public Health
[3 credit hours]
The purpose of this 3 credit course is to develop analysis skills using the SAS statistical package, SPSS, and R for students that already have a basic knowledge of biostatistics.
Prerequisites: PUBH 6000 with a minimum grade of D- or PUBH 8000 with a minimum grade of D-
Term Offered: Spring, Fall

PUBH 6310 Public Health Assessment and Planning
[3 credit hours]
This course introduces the principles of health promotion program assessment and planning. Students learn the process of community health assessment, precursors to program planning, as well as the purposes, procedures, terminology, and specific techniques in the planning process.
Term Offered: Fall

PUBH 6320 Implementation of Public Health Programs
[3 credit hours]
This course is designed to prepare students to implement health education programs in the community. Emphasis will be placed on a variety of health education methods and strategies to plan, promote, present and evaluate health promotion activities.
Prerequisites: PUBH 6310 with a minimum grade of D-
Term Offered: Spring

PUBH 6330 Public Health and Aging
[3 credit hours]
Examines public health and aging issues in contemporary society. Introduces physical, cognitive and affective function from a public health perspective. Prevention and health promotion models are included.
Term Offered: Spring, Summer

PUBH 6420 Social Marketing in Health
[3 credit hours]
The Centers for Disease Control and Prevention (CDC) identify social marketing as a practice allied with Health Education and Health Promotion. The CDC encourages programs to apply the principles of social marketing to health behavior change efforts in order to increase the effectiveness of interventions. Social marketing uses audience research to determine target audience segmentation into groups with common risk behaviors, motivations, and information channel preferences. Key audience segments are then reached with the mix of intervention strategies formed by the "4 P's" of social marketing, namely product, price, place, and promotion. The final product is designed based on the needs and desires of the consumer and persuasive messages promoting behavior change are promoted to the target audience. Continuous evaluation and message revision allows for ongoing refinement on the basis of consumer feedback.
Term Offered: Spring

PUBH 6430 Community Mental Health
[3 credit hours]
In this course, mental health is examined from a public health perspective with a focus on epidemiological, behavioral, sociological and cultural issues. Particular emphasis is placed on the prevention of mental illness, social responses to illness, as well as the social determinants of mental health. Mental health, mental health promotion and community mental health issues are analyzed at individual and population level.
Term Offered: Spring, Summer

PUBH 6500 Disaster Preparedness/Response
[3 credit hours]

PUBH 6510 Issues in Pandemic Preparedness and Response
[3 credit hours]
By means of synchronous, asynchronous, audiovisual, and simulation platforms, the learner will develop an in-depth knowledge concerning how the healthcare infrastructure of a community must plan for, respond to, and recover from a pandemic. The course is divided into four topic areas: 1) introduction; 2) preparedness; 3) response; and 4) recovery.
Term Offered: Spring, Fall

PUBH 6550 Chronic Disease Epidemiology
[3 credit hours]
Epidemiology of selected chronic diseases and non-infectious conditions: cancer, cardiovascular diseases, musculoskeletal diseases and other chronic diseases. Emphasis on classification, rates, associations, etiology, prevention and control.
Prerequisites: PUBH 6010 with a minimum grade of C or PUBH 601 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PUBH 6600 Health Behavior
[3 credit hours]
Examines the role of behaviors on health status and how to influence and understand behavior through use of cognitive models and change theory.
Term Offered: Spring, Summer, Fall

PUBH 6620 Introduction to Health Policy and Health Systems
[3 credit hours]
This course examines public health and healthcare policy from a public health perspective. It emphasizes the interrelatedness of law, the policymaking process, and governmental public health; addresses essential issues in health policy and law (e.g., health insurance, health economics, government health insurances, the uninsured); and introduces health policy analysis.
Term Offered: Spring, Fall

PUBH 6730 Research Environmental Health
[3 credit hours]
Students will participate in selected ongoing research programs of members of the faculty. May be repeated for credit.
Term Offered: Spring, Summer, Fall

PUBH 6790 Independent Study in Biostatistics
[1-3 credit hours]
This independent study provides an opportunity for a single student to engage in advanced, focused study of a selected topic in biostatistics under faculty supervision. The content, learning activities, and deliverables are individualized and determined collaboratively by the student and instructor. Credit hours reflect the scope and intensity of statistical and analytical work completed during the semester.
Term Offered: Spring, Summer, Fall

PUBH 6800 Evaluation Of Health Programs
[3 credit hours]
An exploration of types of program evaluation, evaluation models, data collection, types of data, data quality, evaluation reports, standard data collection instruments and ethical issues in health program evaluation.
Term Offered: Spring, Fall

PUBH 6890 Independent Study in Public Health
[1-3 credit hours]
This independent study provides an opportunity for a single student to engage in advanced, focused study of a selected topic in public health under faculty supervision. The content, learning activities, and deliverables are individualized and determined collaboratively by the student and instructor. Credit hours reflect the scope and intensity of scholarly and applied public health work completed during the semester.
Term Offered: Spring, Summer, Fall

PUBH 6900 Interprofessional Education for Public Health
[1 credit hour]
This 1-Credit hour course for Public Health students has been designed to provide a variety of interprofessional learning activities and educational experiences that include learning modules related to current health topics and issues in our communities such as social determinants of health, human trafficking, poverty, and resilience. Students are required to complete selected educational experiences that provides opportunities to collaborate with students from other health care professions (Athletic Training, Medicine, Nursing, Occupational Therapy, Pharmacy, Physical Therapy, Physician Assistant, Public Health, Respiratory Therapy, Social Work, and Speech Language Pathology) using an experiential learning approach.
Term Offered: Spring, Fall

PUBH 6940 Internship in Occupational Health
[1-3 credit hours]
Comprehensive or focused practical training in industrial hygiene/ occupational health at a designated agency, organization, or company.
Term Offered: Spring, Summer, Fall

PUBH 6950 Integrative Learning Experience
[2 credit hours]
Seminar course which serves as the culminating experience of the MPH program. Students are required to produce a high-quality written product that is appropriate to the student's educational and professional objectives and that must demonstrate both Foundational and Major Competencies.
Term Offered: Spring, Summer, Fall

PUBH 6951 Integrative Learning Experience I
[1 credit hour]
The first course in the two online course sequence emphasizes developing professional skills, planning an integrative learning experience, by proposing a robust culminating project. Students synthesize MPH foundational and major competencies to develop a proposal useful to external stakeholders.
Term Offered: Spring, Summer, Fall

PUBH 6952 Integrative Learning Experience II
[1 credit hour]
The second online course in the ILE sequence focuses on implementing the proposed culminating project, engaging with stakeholders, synthesizing competencies, and producing a high-quality final product and oral presentation.
Term Offered: Spring, Summer, Fall

PUBH 6960 Internship in Public Health
[1-4 credit hours]
This course provides a supervised field experience in a public health setting designed to integrate academic knowledge with practical application. Students complete a structured internship under the guidance of a qualified site supervisor and a University of Toledo Internship Advisor. The internship emphasizes hands#on professional experience aligned with public health competencies. Credit hours reflect the scope and intensity of the field experience completed during the semester.
Term Offered: Spring, Summer, Fall

PUBH 6970 Project in Public Health
[1-4 credit hours]
This independent study provides an opportunity for a single student to engage in advanced, focused study of a selected topic in biostatistics under faculty supervision. The content, learning activities, and deliverables are individualized and determined collaboratively by the student and instructor. Credit hours reflect the scope and intensity of statistical and analytical work completed during the semester.
Term Offered: Spring, Summer, Fall

PUBH 6990 Thesis Research
[1-4 credit hours]

PUBH 8000 Quantitative and Qualitative Data Analysis in Public Health
[3 credit hours]
This course includes introductory content on both quantitative and qualitative methods and relevant data analyses. Quantitative: Statistical methods and principles necessary for understanding and interpreting data used in public health. Topics include descriptive statistics, statistical comparison groups, correlation, and regression. Includes a lab component using SPSS statistical package. Qualitative: Methods for gathering qualitative data and thematic analysis of data in health service research. Activities include analyzing data for emergent themes as well as interpreting and presenting findings.
Term Offered: Spring, Fall

PUBH 8010 Public Health Epidemiology
[3 credit hours]
The course will present principles of the epidemiology method including problem solving. Various study designs will be discussed, including prospective and retrospective studies, analytic, and experimental methods.
Term Offered: Spring, Fall

PUBH 8020 Management and Leadership in Public Health
[3 credit hours]
An introduction to the leadership and management principles necessary for the delivery of public health programs, intervention, and outreach, including fostering collaboration, effective communication, consensus building, negotiation, cultural awareness, budget and resource management, evaluation, coalition building, vision creation, mediation, empowering others, and guiding decision making.
Term Offered: Spring, Summer, Fall

PUBH 8030 Advanced Epidemiology
[3 credit hours]
This course covers principles and methods of epidemiology in depth. The topics include causal inference, risk and effect, confounding, interaction, randomization, and matching. Special emphasis is given to design and interpretation of epidemiological studies.
Term Offered: Spring, Summer

PUBH 8060 Advanced Biostatistics
[3 credit hours]
Advanced statistical techniques with particular emphasis on problems in public health. Multiple regression, methods of analysis of variance, categorical data analysis including logistic regression, non parametric and survival analysis. Problems whose solution involves using a statistical program (e.g., SPSS).
Term Offered: Spring, Fall

PUBH 8090 Issues in Public Health
[3 credit hours]
Examination of various contemporary issues in public health. Includes social, economic, political, and community problems in the provision of health services, health manpower, and payment for health care.

PUBH 8110 Categorical Data Analysis
[3 credit hours]
This course introduces the theory and application of methods for categorical data, with emphasis on biomedical and public health applications. Topics include contingency tables, log-linear and Poisson regression, logistic and probit regression, regression models for nominal and ordinal data, Raush models, multivariate methods for matched pairs and longitudinal data. The methods are illustrated with SAS and SPSS, and R.
Term Offered: Summer

PUBH 8120 Epidemiology Infectious Diseas
[3 credit hours]
Provides an overview of major infectious diseases affecting public health in the U.S. and worldwide; introducing the basic epidemiologic methods for surveillance and investigation of infectious disease outbreaks.
Term Offered: Spring, Fall

PUBH 8130 Molecular Epidemiology
[3 credit hours]
The course focuses on the application of epidemiological techniques to the study of effects of occupational and environmental exposures.
Term Offered: Fall

PUBH 8150 Clinical Epidemiology
[3 credit hours]
This course focuses on epidemiologic concepts and methods in clinical medicine. Topics include clinical measurements and outcomes, risk, prognostic factors, clinical diagnosis, study design, decision analysis, clinical research and meta-analysis.
Term Offered: Spring, Fall

PUBH 8180 Cancer Epidemiology
[3 credit hours]
Focuses on a number of cancers, including the most incident cancers in the United States. Provides a broad overview of cancer epidemiology and basic substantive knowledge regarding many cancers and their risk factors, prevention, and biology and pathogenesis.
Term Offered: Spring, Summer, Fall

PUBH 8500 Disaster Preparedness/Response
[3 credit hours]

PUBH 8510 Issues in Pandemic Preparedness and Response
[3 credit hours]
By means of synchronous, asynchronous, audiovisual, and simulation platforms, the learner will develop an in-depth knowledge concerning how the healthcare infrastructure of a community must plan for, respond to, and recover from a pandemic. The course is divided into four topic areas: 1) introduction; 2) preparedness; 3) response; and 4) recovery.
Term Offered: Spring, Fall

PUBH 8550 Chronic Disease Epidemiology
[3 credit hours]
Epidemiology of selected chronic diseases and non-infectious conditions: cancer, cardiovascular diseases, musculoskeletal diseases and other chronic diseases. Emphasis on classification, rates, associations, etiology, prevention and control.
Prerequisites: PUBH 6010 with a minimum grade of C or PUBH 601 with a minimum grade of C
Term Offered: Spring, Summer

PUBH 8900 Interprofessional Education for Public Health
[1 credit hour]
This 1-Credit hour course for Public Health students has been designed to provide a variety of interprofessional learning activities and educational experiences that include learning modules related to current health topics and issues in our communities such as social determinants of health, human trafficking, poverty, and resilience. Students are required to complete selected educational experiences that provides opportunities to collaborate with students from other health care professions (Athletic Training, Medicine, Nursing, Occupational Therapy, Pharmacy, Physical Therapy, Physician Assistant, Public Health, Respiratory Therapy, Social Work, and Speech Language Pathology) using an experiential learning approach.
Term Offered: Spring, Fall

Master of Public Health: Environmental and Occupational Health

The department of population health offers a variety of degree options and graduate courses. In health, a master of public health is offered with four concentrations.

MPH PROGRAM

Public health is a multidisciplinary field whose goal is to promote the health of the population through organized community efforts. According to the American Public Health Association (APHA), public health is prevention; public health is policy development and population health surveillance; and public health save money, improves quality of life, helps children thrive, and reduces human suffering.

The MPH degree program is fully accredited by the Council on Education for Public Health (CEPH) and can be completed in a minimum of four semesters for full-time students and eight semesters for part-time students.

The Environmental and Occupational Health (ENVH) curriculum focuses on a combination of scientific, technical, and regulatory aspects of public health related to the assessment and control of hazardous physical, chemical, and biological agents in non-occupational and occupational environments. The major focus is recognition, evaluation, and control of human exposures to contaminated air, water, soil, and food.

The MPH Program accepts students for Fall and Spring semesters. Applicants must apply through SLATE and pay the application fee. All required documentation must be submitted electronically.

ADMISSION REQUIREMENTS

- Degree
  - An earned bachelor's degree from an accredited college or university
- Grade Point Average (GPA)
  - Regular admission: GPA ≥ 3.0 (on a 4.0 scale) required
  - Provisional admission may be offered for applicants with 2.7 ≤ GPA < 3.0 for domestic students. International student cannot be admitted provisionally.
- Foundation Courses (required undergraduate courses)
  - All students must have completed courses in college-level mathematics and social sciences
- Official Transcripts
  - Official transcripts from all institutions where any undergraduate or other courses, including any graduate degrees.
  - Transcripts from international institutions MUST be translated into English and evaluated onto a 4.0 scale using a NACES member (EX: WES World Education Services)
- English Language Proficiency
  - An English proficiency score from either TOEFL (80 or higher), IELTS (6.5 or higher) or DUOLINGO (105 or higher) must be submitted
  - Scores will not be accepted if they are more than two years old.
- Resume
  - A current resume must be uploaded
- Statement of Purpose
  - A Statement of Purpose indicating why the applicant wants to pursue the MPH program must be uploaded
  - Applicants may also use this statement to explain any discrepancies in their academic record
- Letters of Recommendation
  - A minimum of three letters are required, which can be requested within the SOPHAS application – remove this.
  - Two of these letters MUST be from someone having a graduate degree
  - The credential of the writer must be included in the recommendation letter

All MPH students are required to take the following 9 (24 credit hours) Foundation Courses.

Code	Title	Hours
Foundation Courses		
PUBH 6000	Quantitative and Qualitative Data Analysis in Public Health	3
PUBH 6010	Public Health Epidemiology	3
PUBH 6020	Management and Leadership in Public Health	3
PUBH 6080	Social Determinants of Health	3
PUBH 6090	Issues in Public Health	3
PUBH 5160	Environmental Health	3
PUBH 6900	Interprofessional Education for Public Health	1
PUBH 6950	Integrative Learning Experience	2
PUBH 6960	Internship in Public Health	3
Total Hours		**24**

Environmental and Occupational Health Concentration *(CIP Code 51.2202 - Environmental Health):*

The Environmental and Occupational Health concentration is provided mostly through face-to-face courses. All students in the Environmental and Occupational Health concentration are required to take the following 5 (15 credit hours) concentration specific courses. In addition, all Environmental and Occupational Health concentration students are required to take 2 (6 total credit hours) advised electives.

Code	Title	Hours
PUBH 5020	Occupational Health	3
PUBH 5060	Occupational Safety	3
PUBH 5310	Chemical Agents and Exposure Assessment	3
PUBH 5560	Health, Safety, and Worker Well-being	3
PUBH 5620	Physical Agents	3
Electives		6
Total Hours		**21**

The plans of study for each concentration are comprised of the Foundational Courses, the concentration specific courses, and two elective courses. The MPH Program has 22 Foundational Competencies that are required and written by the accrediting body (Council on Education for Public Health). These are listed below. There are additional competencies which are specific to each of the four concentrations. These are also established and approved through our external accreditor.

- PLO 1. FOUNDATIONAL COMPETENCIES: Apply epidemiological methods to the breadth of settings and situations in public health practice
- PLO 2. FOUNDATIONAL COMPETENCIES: Select quantitative and qualitative data collection methods appropriate for a given public health context
- PLO 3. FOUNDATIONAL COMPETENCIES: Analyze quantitative and qualitative data using biostatistics, computer-based programming and software, as appropriate
- PLO 4. FOUNDATIONAL COMPETENCIES: Interpret results of data analysis for public health research, policy or practice
- PLO 5. FOUNDATIONAL COMPETENCIES: Compare the organization, structure, and function of health care, public health, and regulatory systems across national and international settings

- PLO 6. FOUNDATIONAL COMPETENCIES: Discuss the means by which structural bias, social inequities, and racism undermine health and create challenges to achieving health equity at organizational, community, and societal levels
- PLO 7. FOUNDATIONAL COMPETENCIES: Assess population needs, assets, and capacities that affect communities' health
- PLO 8. FOUNDATIONAL COMPETENCIES: Apply awareness of cultural values and practices to the design, implementation, or critique of public health policies or programs
- PLO 9. FOUNDATIONAL COMPETENCIES: Design a population-based policy, program, project, or intervention
- PLO 10. FOUNDATIONAL COMPETENCIES: Explain basic principles and tools of budget and resource management
- PLO 11. FOUNDATIONAL COMPETENCIES: Select methods to evaluate public health programs
- PLO 12. FOUNDATIONAL COMPETENCIES: Discuss the policy-making process, including the roles of ethics and evidence
- PLO 13. FOUNDATIONAL COMPETENCIES: Propose strategies to identify relevant communities and individuals and build coalitions and partnerships for influencing public health outcomes
- PLO 14. FOUNDATIONAL COMPETENCIES: Advocate for political, social, or economic policies and programs that will improve health in diverse populations
- PLO 15. FOUNDATIONAL COMPETENCIES: Evaluate policies for their impact on public health and health equity
- PLO 16. FOUNDATIONAL COMPETENCIES: Apply leadership and/or management principles to identify a relevant issue
- PLO 17. FOUNDATIONAL COMPETENCIES: Apply negotiation and mediation skills to address organizational or community challenges
- PLO 18. FOUNDATIONAL COMPETENCIES: Select communication strategies for different audiences and sectors
- PLO 19. FOUNDATIONAL COMPETENCIES: Communicate audience-appropriate public health content, both in writing and through oral presentation to a non-academic, non-peer audience with attention to factors such as literacy and health literacy
- PLO 20. FOUNDATIONAL COMPETENCIES: Describe the importance of cultural humility in communicating public health content
- PLO 21. FOUNDATIONAL COMPETENCIES: Integrate perspectives from other sectors and/or professions to promote and advance population health
- PLO 22. FOUNDATIONAL COMPETENCIES: Apply systems thinking tools to visually represent a public health issue in a format other than standard narrative
- PLO 1. ENVH COMPETENCIES: Identify environmental and occupational harmful factors and stressors which may lead to adverse health effects
- PLO 2. ENVH COMPETENCIES: Describe regulations and programs applicable to the practice of occupational safety in a workplace
- PLO 3. ENVH COMPETENCIES: Evaluate, analyze, and interpret exposure monitoring data and make recommendations for controls to protect worker health
- PLO 4. ENVH COMPETENCIES: Identify, evaluate, and select appropriate controls to reduce the risk of injury and illness in the workplace and improve worker well-being
- PLO 5. ENVH COMPETENCIES: Recommend and assess measures to control environmental and occupational health hazards

Master of Public Health: Generalist

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MPH PROGRAM

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PUBH 6010	Public Health Epidemiology	3
PUBH 6020	Management and Leadership in Public Health	3
PUBH 6050	Concepts and Issues in Environmental Health	3
or PUBH 5160	Environmental Health	
PUBH 6080	Social Determinants of Health	3
PUBH 6090	Issues in Public Health	3
PUBH 6900	Interprofessional Education for Public Health	1
PUBH 6950	Integrative Learning Experience	2
PUBH 6960	Internship in Public Health	3
Total Hours		**24**

The Public Health Generalist concentration is 100% online. All students in the Public Health Generalist concentration are required to take the following 5 (15 credit hours) concentration specific courses. In addition, all Public Health Generalist concentration students are required to take 2 (6 total credit hours) advised electives.

Code	Title	Hours
Major Specific Courses		
PUBH 6030	Advanced Epidemiology	3
PUBH 6310	Public Health Assessment and Planning	3
PUBH 6620	Introduction to Health Policy and Health Systems	3
PUBH 6800	Evaluation Of Health Programs	3
HEAL 6900	Grant Writing In Health Sciences	3
Electives		6
Total Hours		**21**

The plans of study for each concentration are comprised of the Foundational Courses, the concentration specific courses, and two elective courses. The MPH Program has 22 Foundational Competencies that are required and written by the accrediting body (Council on Education for Public Health). These are listed below. There are additional competencies which are specific to each of the four concentrations. These are also established and approved through our external accreditor.

- PLO 1. FOUNDATIONAL COMPETENCIES: Apply epidemiological methods to the breadth of settings and situations in public health practice
- PLO 3. FOUNDATIONAL COMPETENCIES: Analyze quantitative and qualitative data using biostatistics, computer-based programming and software, as appropriate
- PLO 4. FOUNDATIONAL COMPETENCIES: Interpret results of data analysis for public health research, policy or practice
- PLO 5. FOUNDATIONAL COMPETENCIES: Compare the organization, structure, and function of health care, public health, and regulatory systems across national and international settings
- PLO 6. FOUNDATIONAL COMPETENCIES: Discuss the means by which structural bias, social inequities, and racism undermine health and create challenges to achieving health equity at organizational, community, and societal levels
- PLO 7. FOUNDATIONAL COMPETENCIES: Assess population needs, assets, and capacities that affect communities' health
- PLO 8. FOUNDATIONAL COMPETENCIES: Apply awareness of cultural values and practices to the design or implementation, or critique of public health policies or programs
- PLO 9. FOUNDATIONAL COMPETENCIES: Design a population-based policy, program, project, or intervention
- PLO 10. FOUNDATIONAL COMPETENCIES: Explain basic principles and tools of budget and resource management
- PLO 11. FOUNDATIONAL COMPETENCIES: Select methods to evaluate public health programs
- PLO 12. FOUNDATIONAL COMPETENCIES: Discuss the policy-making process, including the roles of ethics and evidence
- PLO 13. FOUNDATIONAL COMPETENCIES: Propose strategies to identify relevant communities and individuals and build coalitions and partnerships for influencing public health outcomes
- PLO 14. FOUNDATIONAL COMPETENCIES: Advocate for political, social, or economic policies and programs that will improve health in diverse populations
- PLO 15. FOUNDATIONAL COMPETENCIES: Evaluate policies for their impact on public health and health equity
- PLO 16. FOUNDATIONAL COMPETENCIES: Apply leadership and/or management principles to identify a relevant issue
- PLO 17. FOUNDATIONAL COMPETENCIES: Apply negotiation and mediation skills to address organizational or community challenge
- PLO 18. FOUNDATIONAL COMPETENCIES: Select communication strategies for different audiences and sectors
- PLO 19. FOUNDATIONAL COMPETENCIES: Communicate audience-appropriate public health content, both in writing and through oral presentation to a non-academic, non-peer audience with attention to factors such as literacy and health literacy
- PLO 20. FOUNDATIONAL COMPETENCIES: Describe the importance of cultural humility in communicating public health content
- PLO 21. FOUNDATIONAL COMPETENCIES: Integrate perspectives from other sectors and/or professions to promote and advance population health
- PLO 22. FOUNDATIONAL COMPETENCIES: Apply systems thinking tools to visually represent a public health issue in a s format other than standard narrative
- PLO 1. PGEN MAJOR COMPETENCIES: Determine if an association is causal using appropriate criteria

- PLO 2. PGEN MAJOR COMPETENCIES: Use established models to assess communities and plan public health interventions
- PLO 3. PGEN MAJOR COMPETENCIES: Use a Health Policy Research Framework to develop the rationale and process to impact a public health topic through policy intervention
- PLO 4. PGEN MAJOR COMPETENCIES: Develop an evaluation plan using a logic model
- PLO 5. PGEN MAJOR COMPETENCIES: Develop a program grant proposal to address a public health problem in a specific community
- PLO 2. FOUNDATIONAL COMPETENCIES: Select quantitative and qualitative data collection methods appropriate for a given public health context.

Master of Public Health: Public Health Promotion and Education

The department of population health offers a variety of degree options and graduate courses. In health, a master of public health is offered with four concentrations.

MPH PROGRAM

Public health is a multidisciplinary field whose goal is to promote the health of the population through organized community efforts. According to the American Public Health Association (APHA), public health is prevention; public health is policy development and population health surveillance; and public health save money, improves quality of life, helps children thrive, and reduces human suffering.

The MPH degree program is fully accredited by the Council on Education for Public Health (CEPH) and can be completed in a minimum of four semesters for full-time students and eight semesters for part-time students.

The Health Promotion and Education (HPRO) curriculum focuses on methods for planning, implementing, and evaluating educational and behavioral changes as well as programs that enhance health.

The MPH Program accepts students for Fall and Spring semesters. Applicants must apply through SLATE and pay the application fee. All required documentation must be submitted electronically.

ADMISSION REQUIREMENTS

- Degree
  - An earned bachelor's degree from an accredited college or university
- Grade Point Average (GPA)
  - Regular admission: GPA ≥ 3.0 (on a 4.0 scale) required
  - Provisional admission may be offered for applicants with 2.7 ≤ GPA < 3.0 for domestic students. International student cannot be admitted provisionally.
- Foundation Courses (required undergraduate courses)
  - All students must have completed courses in college-level mathematics and social sciences
- Official Transcripts
  - Official transcripts from all institutions where any undergraduate or other courses, including any graduate degrees.
  - Transcripts from international institutions MUST be translated into English and evaluated onto a 4.0 scale using a NACES member (EX: WES World Education Services)
- English Language Proficiency
  - An English proficiency score from either TOEFL (80 or higher), IELTS (6.5 or higher) or DUOLINGO (105 or higher) must be submitted
  - Scores will not be accepted if they are more than two years old.
- Resume
  - A current resume must be uploaded
- Statement of Purpose
  - A Statement of Purpose indicating why the applicant wants to pursue the MPH program must be uploaded
  - Applicants may also use this statement to explain any discrepancies in their academic record
- Letters of Recommendation
  - A minimum of three letters are required, which can be requested within the SOPHAS application – remove this.
  - Two of these letters MUST be from someone having a graduate degree
  - The credential of the writer must be included in the recommendation letter

All MPH students are required to take the following 9 (24 credit hours) Foundation Courses.

Code	Title	Hours
Foundation Courses		
PUBH 6000	Quantitative and Qualitative Data Analysis in Public Health	3
PUBH 6010	Public Health Epidemiology	3
PUBH 6020	Management and Leadership in Public Health	3
PUBH 6050	Concepts and Issues in Environmental Health	3
or PUBH 5160	Environmental Health	
PUBH 6080	Social Determinants of Health	3
PUBH 6090	Issues in Public Health	3
PUBH 6900	Interprofessional Education for Public Health	1
PUBH 6950	Integrative Learning Experience	2
PUBH 6960	Internship in Public Health	3
Total Hours		**24**

Public Health Promotion and Education Concentration *(CIP Code 51.2207 - Public Health Education and Promotion):*

The Public Health Promotion and Education concentration is provided mostly through face-to-face courses. All students in the Public Health Promotion and Education concentration are required to take the following 5 (15 credit hours) concentration specific courses. In addition, all Public Health Promotion and Education concentration students are required to take 2 (6 total credit hours) advised electives.

Code	Title	Hours
Public Health Promotion and Education Concentration Specific Courses		
PUBH 6310	Public Health Assessment and Planning	3
PUBH 6320	Implementation of Public Health Programs	3

PUBH 6420	Social Marketing in Health	3
PUBH 6600	Health Behavior	3
PUBH 6800	Evaluation Of Health Programs	3
Electives		6
Total Hours		**21**

The plans of study for each concentration are comprised of the Foundational Courses, the concentration specific courses, and two elective courses. The MPH Program has 22 Foundational Competencies that are required and written by the accrediting body (Council on Education for Public Health). These are listed below. There are additional competencies which are specific to each of the four concentrations. These are also established and approved through our external accreditor. These are listed within each Concentration area.

- PLO 1. FOUNDATIONAL COMPETENCIES: Apply epidemiological methods to the breadth of settings and situations in public health practice
- PLO 2. FOUNDATIONAL COMPETENCIES: Select quantitative and qualitative data collection methods appropriate for a given public health context
- PLO 3. FOUNDATIONAL COMPETENCIES: Analyze quantitative and qualitative data using biostatistics, computer-based programming and software, as appropriate
- PLO 4. FOUNDATIONAL COMPETENCIES: Interpret results of data analysis for public health research, policy or practice
- PLO 5. FOUNDATIONAL COMPETENCIES: Compare the organization, structure, and function of health care, public health, and regulatory systems across national and international settings
- PLO 6. FOUNDATIONAL COMPETENCIES: Discuss the means by which structural bias, social inequities, and racism undermine health and create challenges to achieving health equity at organizational, community, and societal levels
- PLO 7. FOUNDATIONAL COMPETENCIES: Assess population needs, assets, and capacities that affect communities' health
- PLO 8. FOUNDATIONAL COMPETENCIES: Apply awareness of cultural values and practices to the design, implementation or critique of public health policies or programs
- PLO 9. FOUNDATIONAL COMPETENCIES: Design a population-based policy, program, project, or intervention
- PLO 10. FOUNDATIONAL COMPETENCIES: Explain basic principles and tools of budget and resource management
- PLO 11. FOUNDATIONAL COMPETENCIES: Select methods to evaluate public health programs
- PLO 12. FOUNDATIONAL COMPETENCIES: Discuss the policy-making process, including the roles of ethics and evidence
- PLO 13. FOUNDATIONAL COMPETENCIES: Propose strategies to identify relevant communities and individuals and build coalitions and partnerships for influencing public health outcomes
- PLO 14. FOUNDATIONAL COMPETENCIES: Advocate for political, social, or economic policies and programs that will improve health in diverse populations
- PLO 15. FOUNDATIONAL COMPETENCIES: Evaluate policies for their impact on public health and health equity
- PLO 16. FOUNDATIONAL COMPETENCIES: Apply leadership and/or management principles to identify a relevant issue
- PLO 17. FOUNDATIONAL COMPETENCIES: Apply negotiation and mediation skills to address organizational or community challenges
- PLO 18. FOUNDATIONAL COMPETENCIES: Select communication strategies for different audiences and sectors
- PLO 19. FOUNDATIONAL COMPETENCIES: Communicate audience-appropriate public health content, both in writing and through oral presentation to a non-academic, non-peer audience with attention to factors such as literacy and health literacy
- PLO 20. FOUNDATIONAL COMPETENCIES: Describe the importance of cultural humility in communicating public health content
- PLO 21. FOUNDATIONAL COMPETENCIES: Integrate perspectives from other sectors and/or professions to promote and advance population health
- PLO 22. FOUNDATIONAL COMPETENCIES: Apply systems thinking tools to visually represent a public health issue in a format other than standard narrative
- PLO 1. HPRO COMPETENCIES: Use established models to assess communities and plan public health interventions
- PLO 2. HPRO COMPETENCIES: Implement a health education program in a chosen community
- PLO 3. HPRO COMPETENCIES: Determine communication strategies to develop health promotion messages
- PLO 4. HPRO COMPETENCIES: Design a theory-based intervention
- PLO 5. HPRO COMPETENCIES: Develop an evaluation plan using a logic model
- PLO 6. HEALTH PROMOTION AND EDUCATION COMPETENCIES: Develop strategies to organize community members to advocate for change that impacts public health;
- PLO 7. HEALTH PROMOTION AND EDUCATION COMPETENCIES: Differentiate the purposes of formative, process, and outcome evaluation;
- PLO 8. HEALTH PROMOTION AND EDUCATION COMPETENCIES: Apply program evaluation knowledge and skill using established models.

Master of Public Health: Public Health Epidemiology

The department of population health offers a variety of degree options and graduate courses. In health, a master of public health is offered with four concentrations.

MPH PROGRAM

Public health is a multidisciplinary field whose goal is to promote the health of the population through organized community efforts. According to the American Public Health Association (APHA), public health is prevention; public health is policy development and population health surveillance; and public health save money, improves quality of life, helps children thrive, and reduces human suffering.

The MPH degree program is fully accredited by the Council on Education for Public Health (CEPH) and can be completed in a minimum of four

semesters for full-time students and eight semesters for part-time students.

The Public Health Epidemiology concentration prepares students for careers involving the study of the distribution of disease in large groups or from a population-based perspective. The study of epidemiology includes factors affecting disease and disability in population and is a fundamental science of public health and preventive medicine. Epidemiology research traditionally has focused on causes of disease through population study for both infectious and chronic diseases. Epidemiologists attempt to quantify the distribution and establish the determinants of health problems by describing and analyzing the biological, environmental, social, and behavioral factors affecting health, illness, and premature death.

The MPH Program accepts students for Fall and Spring semesters. Applicants must apply through SLATE and pay the application fee. All required documentation must be submitted electronically.

ADMISSION REQUIREMENTS

- Degree
  - An earned bachelor's degree from an accredited college or university
- Grade Point Average (GPA)
  - Regular admission: GPA ≥ 3.0 (on a 4.0 scale) required
  - Provisional admission may be offered for applicants with 2.7 ≤ GPA < 3.0 for domestic students. International student cannot be admitted provisionally.
- Foundation Courses (required undergraduate courses)
  - All students must have completed courses in college-level mathematics and social sciences
- Official Transcripts
  - Official transcripts from all institutions where any undergraduate or other courses, including any graduate degrees.
  - Transcripts from international institutions MUST be translated into English and evaluated onto a 4.0 scale using a NACES member (EX: WES World Education Services)
- English Language Proficiency
  - An English proficiency score from either TOEFL (80 or higher), IELTS (6.5 or higher) or DUOLINGO (105 or higher) must be submitted
  - Scores will not be accepted if they are more than two years old.
- Resume
  - A current resume must be uploaded
- Statement of Purpose
  - A Statement of Purpose indicating why the applicant wants to pursue the MPH program must be uploaded
  - Applicants may also use this statement to explain any discrepancies in their academic record
- Letters of Recommendation
  - A minimum of three letters are required, which can be requested within the SOPHAS application – remove this.
  - Two of these letters MUST be from someone having a graduate degree
  - The credential of the writer must be included in the recommendation letter

All MPH students are required to take the following 9 (24 credit hours) Foundation Courses.

Code	Title	Hours
Foundation Courses		
PUBH 6000	Quantitative and Qualitative Data Analysis in Public Health	3
PUBH 6010	Public Health Epidemiology	3
PUBH 6020	Management and Leadership in Public Health	3
PUBH 6050	Concepts and Issues in Environmental Health	3
or PUBH 5160	Environmental Health	
PUBH 6080	Social Determinants of Health	3
PUBH 6090	Issues in Public Health	3
PUBH 6900	Interprofessional Education for Public Health	1
PUBH 6950	Integrative Learning Experience	2
PUBH 6960	Internship in Public Health	3
Total Hours		**24**

Public Health Epidemiology Concentration *(CIP Code 26.1309 - Epidemiology):*

The Public Health Epidemiology concentration is provided mostly through face-to-face courses. All students in the Public Health Epidemiology concentration are required to take the following 5 (15 credit hours) concentration specific courses. In addition, all Public Health Epidemiology concentration students are required to take 2 (6 total credit hours) advised electives.

Code	Title	Hours
Public Health Epidemiology Concentration Specific Courses		
PUBH 6030	Advanced Epidemiology	3
PUBH 6060	Advanced Biostatistics	3
PUBH 6120	Epidemiology Infectious Diseas	3
PUBH 6130	Molecular Epidemiology	3
PUBH 6550	Chronic Disease Epidemiology	3
Electives		6
Total Hours		**21**

The plans of study for each concentration are comprised of the Foundational Courses, the concentration specific courses, and two elective courses. The MPH Program has 22 Foundational Competencies that are required and written by the accrediting body (Council on Education for Public Health). These are listed below. There are additional competencies which are specific to each of the four concentrations. These are also established and approved through our external accreditor.

- PLO 1. FOUNDATIONAL COMPETENCIES: Apply epidemiological methods to the breadth of settings and situations in public health practice
- PLO 2. FOUNDATIONAL COMPETENCIES: Select quantitative and qualitative data collection methods appropriate for a given public health context

- PLO 3. FOUNDATIONAL COMPETENCIES: Analyze quantitative and qualitative data using biostatistics, computer-based programming and software, as appropriate
- PLO 4. FOUNDATIONAL COMPETENCIES: Interpret results of data analysis for public health research, policy or practice
- PLO 5. FOUNDATIONAL COMPETENCIES: Compare the organization, structure, and function of health care, public health, and regulatory systems across national and international settings
- PLO 6. FOUNDATIONAL COMPETENCIES: Discuss the means by which structural bias, social inequities, and racism undermine health and create challenges to achieving health equity at organizational, community, and societal levels
- PLO 7. FOUNDATIONAL COMPETENCIES: Assess population needs, assets, and capacities that affect communities' health
- PLO 8. FOUNDATIONAL COMPETENCIES: Apply awareness of cultural values and practices to the design, implementation, or critique of public health policies or programs
- PLO 9. FOUNDATIONAL COMPETENCIES: Design a population-based policy, program, project, or intervention
- PLO 10. FOUNDATIONAL COMPETENCIES: Explain basic principles and tools of budget and resource management
- PLO 11. FOUNDATIONAL COMPETENCIES: Select methods to evaluate public health programs
- PLO 12. FOUNDATIONAL COMPETENCIES: Discuss the policy-making process, including the roles of ethics and evidence
- PLO 13. FOUNDATIONAL COMPETENCIES: Propose strategies to identify relevant communities and individuals and build coalitions and partnerships for influencing public health outcomes
- PLO 14. FOUNDATIONAL COMPETENCIES: Advocate for political, social, or economic policies and programs that will improve health in diverse populations
- PLO 15. FOUNDATIONAL COMPETENCIES: Evaluate policies for their impact on public health and health equity
- PLO 16. FOUNDATIONAL COMPETENCIES: Apply leadership and/or management principles to identify a relevant issue
- PLO 17. FOUNDATIONAL COMPETENCIES: Apply negotiation and mediation skills to address organizational or community challenges
- PLO 18. FOUNDATIONAL COMPETENCIES: Select communication strategies for different audiences and sectors
- PLO 19. FOUNDATIONAL COMPETENCIES: Communicate audience-appropriate public health content, both in writing and through oral presentation to a non-academic, non-peer audience with attention to factors such as literacy and health literacy
- PLO 20. FOUNDATIONAL COMPETENCIES: Describe the importance of cultural humility in communicating public health content
- PLO 21. FOUNDATIONAL COMPETENCIES: Integrate perspectives from other sectors and/or professions to promote and advance population health
- PLO 22. FOUNDATIONAL COMPETENCIES: Apply systems thinking tools to visually represent a public health issue in a format other than standard narrative
- PLO 1. PHEP COMPETENCIES: Determine if an association is causal using appropriate criteria
- PLO 2. PHEP COMPETENCIES: Design a statistical plan for the analysis of health-related bib data
- PLO 3. PHEP COMPETENCIES: Formulate appropriate public health recommendations using evidence-based practice based on a synthesis of findings across studies found in scientific literature
- PLO 4. PHEP COMPETENCIES: Identify and apply molecular principles and technologies in public health practice
- PLO 5. PHEP COMPETENCIES: Design an epidemiologic study

MS in Occupational Health

Program of Study for the Master of Science in Occupational Health: Industrial Hygiene Program

The Master of Science in Occupational Health (MSOH) degree program is available in Industrial Hygiene. Industrial hygiene professionals are involved in understanding and implementing scientific, technical, and regulatory aspects that focus on preventing and controlling workers' exposures to factors and agents that can cause them harm.

The comprehensive and flexible curriculum provides a solid foundation of information for students with limited or no background in industrial hygiene, while simultaneously offering students with professional experience the opportunity to expand the scope of their knowledge and skills. The program offers classes during evenings to facilitate graduate study for those engaged in full-time daily employment.

The MSOH program is accredited by the Applied and Natural Science Accreditation Commission of ABET. The degree requires a minimum of four semesters to complete as a full-time student, while part time students take approximately eight semesters to complete the program.

Applicants must apply through SLATE and pay the application fee. All required documentation must be submitted electronically.

Submission materials must include:

1) official transcripts from all institutions where they have taken courses (transcripts from institutions from outside the US must be translated, evaluated onto a 4.0 scale using a NACES member EX: WES World Education Services)

2) 3 letters of recommendation (2 of which must be from persons with a graduate degree; one can have professional certification such as CIH)

3) a resume

4) a letter of interest (statement of purpose).

Regular admission to the MSOH program requires:

- An earned bachelor's degree from an accredited college or university
- GPA>#3.00 (on a 4.00 scale)#for regular admission and GPA 2.7 < GPA < 3.0 for provisional admission. International students cannot be admitted provisionally.

- Foundation courses in biology or related science (e.g., biology, biochemistry, anatomy, physiology, etc.), general and organic chemistry, physics, college-level math, social science
- Work experience based on applicability and duration and applicable certifications such as CIH or CSP will also be considered.
- An English proficiency score from either TOEFL (80 or higher), IELTS (6.5 or higher) or DUOLINGO (105 or higher) must be submitted
- Scores will not be accepted if they are more than two years old.

The MSOH degree has a minimum of 40 credit hours for degree requirements. The curriculum incorporates the general areas of science, technology, management, and communication within the context of the core courses and thesis requirements for the MSOH degree.

All MSOH students take the following courses. For those students not requiring an internship, 1 advised elective is added.

Code	Title	Hours
PUBH 5020	Occupational Health	3
PUBH 5060	Occupational Safety	3
PUBH 5160	Environmental Health	3
PUBH 5260	Haz Mat and Emerg Response	3
PUBH 5310	Chemical Agents and Exposure Assessment	3
PUBH 5410	Hazard Control	3
PUBH 5560	Health, Safety, and Worker Well-being	3
PUBH 5620	Physical Agents	3
PUBH 5700	Risk Assessment	3
PUBH 6000	Quantitative and Qualitative Data Analysis in Public Health	3
PUBH 6010	Public Health Epidemiology	3
PUBH 6960	Internship in Public Health (3 credits required if <1 year experience, otherwise 3 credits advised electives)	3
PUBH 6970	Project in Public Health	4
or PUBH 6990	Thesis Research	
Total Hours		**40**

- PLO 1. Explain fundamental aspects of environmental health, safety, and epidemiological principles.
- PLO 2 Interpret and apply applicable occupational and environmental regulations.
- PLO 3. Anticipate, recognize, evaluate, control and confirm existing and potentially hazardous agents, conditions and practices.
- PLO 4. Examine the physiological and/or toxicological interactions of physical, chemical, biological, and ergonomic, risks, factors, and/or stressors with the human body based on applicable pathways and modes of entry.
- PLO 5. Evaluate comprehensive exposure assessment strategies and techniques (qualitative, semi-quantitative, and quantitative).
- PLO 6. Calculate, interpret, and apply statistical techniques for exposure monitoring and other data.
- PLO 7. Describe applicable business and risk management principles, and leadership practices.
- PLO 8. Communicate effectively (e.g., orally, technical writing) with a range of audiences.
- PLO 9. Discuss the importance of ethical and professional responsibilities.
- PLO 10. Function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

Graduate Certificate in Biostatistics and Epidemiology

The 15 credit hours graduate Certificate in Biostatistics and Epidemiology focuses on the development of the qualitative and quantitative knowledge and skills to collect, organize, analyze, and interpret data associated with epidemiologic investigations, health surveys, injury and illness recognition, and human exposure assessment. The Certificate in Biostatistics and Epidemiology provides learners with an expanded scope and depth of quantitative knowledge and skills, as compared to the Certificate in Epidemiology. NOCPH MPH students may not take this certificate concurrently while earning the MPH.

Student Learning Objectives

Student Learning Objectives for the Certificate in Biostatistics and Epidemiology:

- Select and apply appropriate biostatistical and epidemiological methods and interpret basic and applied research data
- Define and calculate measures of disease frequency and measures of association between risk factors and disease
- Describe the major epidemiologic research study designs and their advantages and limitations
- Define the basic terms and apply methods used in outbreak investigation, infectious disease epidemiology, chronic disease epidemiology, disease prevention trials, and evaluation of screening tests
- Review the scientific literature with competence, synthesize findings across studies, and make appropriate public health recommendations based on current knowledge
- Design an epidemiologic study to address a question of interest
- Write a clear description of the rationale, methods, results, and interpretation of an epidemiologic investigation
- Apply epidemiologic skills in a clinical or public health setting, specifically in the formulation or application of health-related programs or policies

Certificate in Biostatistics and Epidemiology students take the following courses.

Code	Title	Hours
PUBH 6000/8000	Quantitative and Qualitative Data Analysis in Public Health	3
PUBH 6010/8010	Public Health Epidemiology	3
PUBH 6030/8030	Advanced Epidemiology	3
PUBH 6060/8060	Advanced Biostatistics	3

PUBH 6110/8110	Categorical Data Analysis	3
Total Hours		**15**

- PLO 1. Define and calculate measures of disease frequency and measures of association between risk factors and disease.
- PLO 2. Describe the major epidemiologic research study designs and their advantages and limitations.
- PLO 3. Describe the major sources of bias in epidemiologic research (confounding, selection bias, and measurement error) and the ways to evaluate and reduce bias.
- PLO 4. Apply criteria to support whether an association is causal.
- PLO 5. Interpret the results of an epidemiologic study, including the relation to findings from other epidemiologic studies, potential biologic and/or social mechanisms, the limitations of the study, and any public health implications.
- PLO 6. Describe basic biostatistical methods and perform basic statistical analyses.

Graduate Certificate in Epidemiology

The 12 credit hours graduate Certificate in Epidemiology focuses on the development of the qualitative and quantitative knowledge and skills to collect, organize, analyze, and interpret data associated with epidemiologic investigations, health surveys, injury and illness recognition, and human exposure assessment. NOCPH MPH students may not take this certificate concurrently while earning the MPH.

Student Learning Objectives

Student learning objectives for the Certificate in Epidemiology:

- Select and apply appropriate biostatistical and epidemiological methods and interpret basic and applied research data
- Define and calculate measures of disease frequency and measures of association between risk factors and disease
- Describe the major epidemiologic research study designs and their advantages and limitations
- Define the basic terms and apply methods used in outbreak investigation, infectious disease epidemiology, chronic disease epidemiology, disease prevention trials, and evaluation of screening tests
- Review the scientific literature with competence, synthesize findings across studies, and make appropriate public health recommendations based on current knowledge
- Design an epidemiologic study to address a question of interest
- Write a clear description of the rationale, methods, results, and interpretation of an epidemiologic investigation
- Apply epidemiologic skills in a clinical or public health setting, specifically in the formulation or application of health-related programs or policies

Certificate in Epidemiology students take the following courses.

Code	Title	Hours
PUBH 6000/8000	Quantitative and Qualitative Data Analysis in Public Health	3
PUBH 6010/8010	Public Health Epidemiology	3
PUBH 6120/8120	Epidemiology Infectious Diseas	3
PUBH 6550/8550	Chronic Disease Epidemiology	3
Total Hours		**12**

- PLO 1. Define and calculate measures of disease frequency and measures of association between risk factors and disease.
- PLO 2. Describe the major epidemiologic research study designs and their advantages and limitations.
- PLO 3. Describe the major sources of bias in epidemiologic research (confounding, selection bias, and measurement error) and the ways to evaluate and reduce bias.
- PLO 4. Apply criteria to support whether an association is causal.
- PLO 5. Describe the basic terms and methods used in outbreak investigation, infectious disease epidemiology, chronic disease epidemiology, disease prevention trials, and evaluation of screening tests.
- PLO 6. Interpret the results of an epidemiologic study, including the relation to findings from other epidemiologic studies, potential biologic and/or social mechanisms, the limitations of the study, and any public health implications.

Graduate Certificate in Public Health Emergency Response

Certificate in Public Health and Emergency Response students take the following courses.

Code	Title	Hours
PUBH 5260	Haz Mat and Emerg Response	3
PUBH 6000	Quantitative and Qualitative Data Analysis in Public Health	3
PUBH 6010	Public Health Epidemiology	3
Select one of the following:		3
PUBH 5310	Chemical Agents and Exposure Assessment	
PUBH 5520		
PUBH 5700	Risk Assessment	
PUBH 6030	Advanced Epidemiology	
PUBH 6120	Epidemiology Infectious Diseas	
Total Hours		**12**

- PLO 1. Apply fundamental and advanced principles of statistics, epidemiology, environmental health science, and occupational health science to real-world public health issues and problems.
- PLO 2. Objectively and subjectively assess chemical, biological, and physical agents classified as hazardous to human health.
- PLO 3. Conduct fundamental sample collection of media contaminated with hazardous chemical, biological, and physical agents.
- PLO 4. Critically analyze and interpret statistical, epidemiological, toxicological, and communicable disease information for prevention and remediation program development and implementation.
- PLO 5. Collect and evaluate applicable information to conduct disaster preparation/planning.

Graduate Certificate in Occupational Health

The 15 credit hours graduate Certificate in Occupational Health provides education and training focused on scientific, technical, regulatory, and administrative principles and practices for preventing and controlling worker and community exposures to physical (e.g., noise, radiation), chemical (e.g., toxic), and biological (e.g., infectious, allergenic, intoxicating) agents and ergonomic factors that can cause human illness. The profession focuses on prevention of exposure or occurrence and mitigation of factors and agents that contribute to illness and jury to workers and other members of the community. Occupational health professionals also have the education and training applicable to preparedness for, and response to natural disaster and intentional terrorist events. NOCPH MPH students may take this certificate concurrently while earning their MPH, except for ENVH majors.

Student Learning Objectives

Student learning objectives for the Certificate in Occupational Health:

- Identify agents, factors, and stressors generated by and/or associated with defined sources, unit operations, and/or processes
- Describe qualitative and quantitative aspects of generation of agents, factors, and stressors
- Describe physiological and/or toxicological interactions of physical, chemical, biological, and ergonomic agents, factors, and/or stressors with the human body
- Recommend and evaluate engineering, administrative, and personal protective equipment controls and/or other interventions to reduce and eliminate hazards
- Demonstrate an understanding of applicable business and managerial practices
- Interpret and apply applicable occupational and environmental regulations

Certificate in Occupational Health students take the following courses.

Code	Title	Hours
PUBH 5020	Occupational Health	3
PUBH 5310	Chemical Agents and Exposure Assessment	3
PUBH 5410	Hazard Control	3
PUBH 5620	Physical Agents	3
Select one of the following:		3
PUBH 5060	Occupational Safety	
PUBH 5160	Environmental Health	
PUBH 5260	Haz Mat and Emerg Response	
PUBH 6000	Quantitative and Qualitative Data Analysis in Public Health	
PUBH 6010	Public Health Epidemiology	
Total Hours		**15**

- PLO 1. Identify agents, factors, and stressors generated by and/or associated with defined sources, unit operations, and/or processes.
- PLO 2. Describe qualitative and quantitative aspects of generation of agents, factors, and stressors.
- PLO 3. Describe physiological and/or toxicological interactions of physical, chemical, biological, and ergonomic agents, factors, and/or stressors with the human body.
- PLO 4. Recommend and evaluate engineering, administrative, and personal protective equipment controls and/or other interventions to reduce or eliminate hazards.
- PLO 5. Demonstrate an understanding of applicable business and managerial practices.
- PLO 6. Interpret and apply applicable occupational and environmental regulations.

School of Nursing

Accreditation

The master's degree program in nursing, the Doctor of Nursing Practice program and the post-graduate APRN certificate program at The University of Toledo School of Nursing are accredited by the Commission on Collegiate Nursing Education (a (http://www.utoledo.edu/nursing/ccneaccreditation.org)acnnursing.org/ccne (https://www.aacnnursing.org/ccne/)).

Administration of Programs

All graduate programs in the School of Nursing are administered jointly by the College of Health and Human Services and the College of Graduate Studies of The University of Toledo. Students may contact admitnurse@utoledo.edu, the school's graduate advisor, or the College of Graduate Studies for further information on programs and admission requirements.

Admission to Graduate Programs

Applications are completed through Nursing CAS at http://nursingcas.liaisoncas.com (http://nursingcas.liaisoncas.com/)and by paying the institutional fee at UToledo Graduate Admission Fee (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Furldefense.com%2Fv3%2F__https%3A%2Fnam04.safelinks.protection.outlook.com%2F%3Furl%3Dhttps*3A*2F*2Fsecure.touchnet.net*2FC20238_ustores*2Fweb*2Fstore_cat.jsp%26data%3D04*7C01*7CKathleen.Mitchell*40utoledo.edu*7Cc4a4498c4ac5448717b408d9e%3Dx3oj4ZPupj5B1wETs8lvNIPFwbFmN*2BIerPFaKxPsPXY*3D%26reserved%3D0__%3BJSUlJSUlJSUlJSUlJSUlJSUlJSUlJSU!!H7RMwWoQC50I58g!k6yLB2GIjG-KUKzC1p37TAYbepSBaWIlbecF8mlxgbGMzuaLLTkB0W1LOE11c1E5wg%24&data=05%7C01%7CSarah.Hartford%40UToledo.Edu%7C7cfde2dc545c411cb12108db320803b0%7C1d6b1707baa94a3da8f8deabfb3d46%7C0%7C0%7C638158782224385956%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLC%7C3000%7C%7C%7C&sdata=kWoSH%2BSuh1QTwh93QuovzGHNBiDJ7oYbEAJuvlsbt7Y%3D&reserved=0).

Admission is competitive.

Application deadlines are located at www.utoledo.edu/nursing/howtoapply.html (http://www.utoledo.edu/nursing/howtoapply.html). Applications must be electronically submitted by the posted deadlines.

Advising

Students must meet with their advisor to develop and maintain an accurate plan of study throughout their program. Changes to the plan of study must be approved by the graduate advisor, program director, and Chief Nurse Administrator. Students are responsible for meeting all requirements for the degree as specified by the plan of study for the school, College of Health and Human Services, College of Graduate Studies, and the University of Toledo. Students are required to have a current and accurate plan of study at all times.

Only students accepted into a specific concentration within the MSN and DNP programs are allowed to take courses within that concentration. Students wishing to take courses outside of their approved program concentration need permission of course faculty, program director, graduate advisor, and Chief Nurse Administrator. Permission is not guaranteed.

State Authorization and Professional Licensure Information

The University of Toledo (UToledo) programs leading to licensure and/or advanced practice certification/endorsement, whether delivered online or face-to-face, satisfy the academic requirements for those credentials set forth by the State of Ohio.

Requirements for licensure and/or advanced practice certification/endorsement eligibility vary from state to state. Please visit the National Council of State Boards of Nursing (https://www.ncsbn.org/contact-bon.htm) website to determine practice requirements for states other than Ohio.

Doctor Of Nursing Practice (DNP), Advanced Practice Nursing (p. 140)

- Adult Gerontology Acute Care Nurse Practitioner Concentration
- Family Nurse Practitioner Concentration
- Pediatric Primary Care Nurse Practitioner Concentration
- Psychiatric Mental Health Nurse Practitioner Concentration

Doctor of Nursing Practice in Nurse Anesthesia (p. 144)

Doctor Of Nursing Practice (DNP), Nurse Executive (p. 145)

Nurse Leadership, Post Master's DNP (p. 146)

Master Of Science in Nursing (MSN), Advanced Practice Nursing (p. 147)

- Adult Gerontology Acute Care Nurse Practitioner Concentration
- Family Nurse Practitioner Concentration
- Pediatric Primary Care Nurse Practitioner Concentration
- Psychiatric Mental Health Nurse Practitioner Concentration

Master Of Science In Nursing (MSN), Graduate Entry (p. 150)

Graduate Certificate Programs

For Current Registered Nurses with a Graduate Degree in Nursing:

- Adult Gerontology Acute Care Nurse Practitioner (p. 151)
- Family Nurse Practitioner Graduate Certificate (p. 151)
- Pediatric Primary Care Nurse Practitioner Graduate Certificate (p. 153)
- Psychiatric Mental Health Nurse Practitioner Graduate Certificate (p. 153)

NURS 5000 Population Focused Nursing
[4 credit hours]
Focus on exploring population and community health, applying nursing and other related sciences to assess populations, communities, and aggregates to design effective nursing systems in collaboration with partners to improve health.
Term Offered: Summer, Fall

NURS 5001 Health Assessment and Technical Competencies I
[5 credit hours]
Focus on holistic assessment of diverse populations across the lifespan. Emphasis on the application of knowledge and skills through experiential and interprofessional activities, while laying the foundation for scholarly inquiry.
Term Offered: Summer, Fall

NURS 5002 Physiology and Pathophysiology I
[3 credit hours]
Examine physical, biological, nutritional, microbiological sciences and principles related to human physiology. Focus on advanced physiologic and pathophysiologic mechanisms underlying human responses of nutritional, genetic, inflammatory, immune, and nervous system diseases.
Term Offered: Summer, Fall

NURS 5003 Professional Socialization
[3 credit hours]
Understanding of the professional nursing role including historical, legal, ethical, political, economic, and cultural diversity that impact nursing practice. Examine nursing theories and models of professional nursing practice.
Term Offered: Summer, Fall

NURS 5004 Nursing Care of Adults in Health and Illness
[5 credit hours]
Focus on health promotion, disease prevention, and implementation of evidence-based care with emphasis on nursing interventions, management, and the evaluation of effectiveness in the care of adults with chronic health problems.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5001 with a minimum grade of B and NURS 5002 with a minimum grade of B
Term Offered: Spring, Summer

NURS 5005 Health Assessment and Technical Competencies II
[3 credit hours]
Focus on application of assessment skills and demonstrating safe procedures for high-risk interventions in simulated experiences. Emphasis on the concepts of clinical judgment, professional behaviors, and interprofessional collaboration.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5001 with a minimum grade of B and NURS 5002 with a minimum grade of B and NURS 5003 with a minimum grade of B
Corequisites: NURS 5004, NURS 5006, NURS 5007
Term Offered: Spring, Summer

NURS 5006 Physiology and Pathophysiology II
[3 credit hours]
Focus on advanced physiologic and pathophysiologic mechanisms underlying disease processes across the life span and prevention strategies. Examine cardiovascular, respiratory, endocrine, musculoskeletal, nervous, genitourinary, hepatobiliary, renal, integumentary and gastrointestinal systems.
Prerequisites: NURS 5002 with a minimum grade of B
Term Offered: Spring, Summer

NURS 5007 Pharmacology for the Graduate Entry Nurse
[3 credit hours]
Focus on pharmacologic principles with emphasizes on physiological responses to drugs, expected outcomes, and potential drug interactions. Prepares for critical thinking in application of pharmacotherapy principles to nursing practice.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5001 with a minimum grade of B and NURS 5002 with a minimum grade of B and NURS 5003 with a minimum grade of B
Term Offered: Spring, Summer

NURS 5008 Healthcare for Women and Children
[4 credit hours]
Focus on management and care of diverse childbearing families and children during health and illness in a variety of settings.
Prerequisites: NURS 5004 with a minimum grade of B and NURS 5005 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5007 with a minimum grade of B
Term Offered: Summer

NURS 5009 Mental Health and Therapeutic Communications
[3 credit hours]
Students will develop a psychotherapeutic relationship with individuals, groups, and families who are experiencing complex mental health disorders, including substance abuse, trauma, serious mental illness, and impaired functioning.
Term Offered: Summer

NURS 5220 Capstone Seminar
[1-3 credit hours]
Capstone projects are culminating experiences completed at the end of a plan of study. They are designed to encourage students to think critically, solve challenging problems, and develop skills such as oral communication, public speaking, research skills, media literacy, teamwork, planning, self-sufficiency, or goal setting.
Prerequisites: NURS 6910 (may be taken concurrently) with a minimum grade of B or NURS 5910 (may be taken concurrently) with a minimum grade of B and NURS 5220 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Summer, Fall

NURS 5530 Public Policy and Health Care
[3 credit hours]
Explores the public policy process from agenda setting through program evaluation. Focus is on how health problems are brought to the attention of government and solutions are obtained. Some field work is expected.
Term Offered: Spring, Summer, Fall

NURS 5610 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adults
[7 credit hours]
The first course in the Psychiatric-Mental Health Nurse Practitioner track focuses on preparing the student in the advanced practice role of assessment, diagnosis, and treatment planning of select acute and chronic psychiatric disorders and mental health care needs of individuals across the lifespan.
Prerequisites: NURS 5740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 (may be taken concurrently) with a minimum grade of B

NURS 5620 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical II Child, Adolescent, Family
[7 credit hours]
The course explores the major group and family psychotherapeutic approaches. Theories and models of group and family psychotherapy are examined as they can be applied across the lifespan, with diverse populations, and in traditional and non-traditional settings.
Prerequisites: NURS 5610 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5680 with a minimum grade of B

NURS 5630 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adults
[9 credit hours]
Focuses on the role of the advanced practice nurse in management of children, adolescents, adults, older adults with acute or chronic psychiatric or mental health concerns.
Prerequisites: NURS 5610 with a minimum grade of B and NURS 5620 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B

NURS 5680 Advanced Physiology and Pathophysiology
[3 credit hours]
Focuses on advanced physiologic and pathophysiologic mechanisms underlying human responses to illness across ther life-span. Students will build on existing knowledge of human anatomy and physiology.
Term Offered: Spring, Fall

NURS 5690 Advanced Pharmacotherapeutics
[3 credit hours]
Focuses on advanced pharmacologic principles in decision making for pharmacotherapy. Emphasizes physiological responses to drugs, expected outcomes, adverse reactions, and potential drug interactions. Discusses professional responsibilities of prescriptive privileges.
Term Offered: Spring, Fall

NURS 5710 Advanced Pediatric Pharmacotherapeutics
[1 credit hour]
Focuses on advanced pharmacologic principles in pediatric pharmacotherapy decision making for the advanced practice as a primary care pediatric nurse practitioner. The focus in on principles of pharmacokinetics, pharmacodynamics, and evidence-based pharmacotherapeutics for the care of infants, children, adolescents, young adults.
Corequisites: NURS 5690
Term Offered: Fall

NURS 5720 Advanced Pediatric Physiology and Pathophysiology
[1 credit hour]
This course provides a scientific foundation for advanced practice as a primary care pediatric nurse practitioner. The focus in on developmental physiology and pathophysiology of infants, children, adolescents, young adults. The embryology of organs and systems of the body will be discussed from conception through birth. Alterations in the function of organs and systems of the body affecting the pediatric population will be presented.
Corequisites: NURS 5680
Term Offered: Fall

NURS 5730 Advanced Pediatric Health Assessment
[3 credit hours]
This course provides the foundation for advanced assessment skills required to practice as a primary care pediatric nurse practitioner. The focus in on the health assessment of infants, children, adolescents, young adults, and their families. A comprehensive, holistic, and developmental approach to advanced practice will focus on the specific knowledge and skills required when conducting pediatric history and physical examinations.
Term Offered: Spring

NURS 5810 Pediatric Nurse Practitioner Clinical I: Care of Children and Concepts of Wellness
[7 credit hours]
Focuses on the health care needs of children and adolescents and principles of health promotion and wellness. Students will have opportunity to begin development of skills in primary health care settings.
Prerequisites: NURS 5740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5400 with a minimum grade of B
Term Offered: Summer

NURS 5820 Pediatric Nurse Practitioner Clinical II: Acute/Chronic
[6 credit hours]
Focuses on the care of children and adolescents with an emphasis on the management of common acute and stable chronic illnesses.
Prerequisites: NURS 5810 with a minimum grade of C
Term Offered: Fall

NURS 5830 Pediatric Nurse Practitioner Clinical III: Complex, Chronic Illnesses or Disabilities
[7 credit hours]
Focuses on management of common and complex acute and chronic conditions of children and adolescents. Issues of disability and developmental conditions are addressed. Emphasis is on integration of the advanced practice role.
Prerequisites: NURS 5820 with a minimum grade of B
Term Offered: Spring

NURS 5910 Advanced Research for Evidence Based Nursing Practice
[3 credit hours]
Critically evaluate published research for clinical relevance, identify a research problem, select a conceptual framework, review selected literature, and prepare a quantitative or qualitative research proposal.
Prerequisites: (NURS 5400 with a minimum grade of B and INDI 6000 with a minimum grade of C) or (NURS 7400 with a minimum grade of B and INDI 8000 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

NURS 5980 Comprehensive Exam in Nursing
[3 credit hours]
Program capstone emphasizes independent comprehensive review preparation for exams with synthesis of knowledge from the total graduate nursing curriculum and review of relevant literature in selected field of study.
Term Offered: Spring, Summer, Fall

NURS 6001 Nursing Care of Adults with Complex Health Problems
[5 credit hours]
Focus on management and care of patients with complex health problems in acute-care settings. Emphasis is on utilization of the nursing process, evidence-based care, leadership, interprofessional collaboration, refinement of clinical judgement, and decision-making skills for safe and effective quality health care.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5001 with a minimum grade of B and NURS 5002 with a minimum grade of B and NURS 5004 with a minimum grade of B and NURS 5005 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5007 with a minimum grade of B
Term Offered: Fall

NURS 6002 Quality and Informatics in Healthcare
[3 credit hours]
Exploration of informatics utilized in and supporting evidence-based practice, and quality in healthcare. Utilization of theory, methods, tools, and processes for identifying and analyzing issues, appraisal of appropriate action selection, implementation, and evaluation for improvement and control of quality outcomes in healthcare organizations.
Term Offered: Fall

NURS 6003 Experiencing Nursing Systems Practicum
[7 credit hours]
Focus on integration of nursing knowledge and skills in designing, implementing and evaluating nursing systems addressing client needs while partnered with an expert registered nurse in clinical experiences.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5004 with a minimum grade of B and NURS 5008 with a minimum grade of B and NURS 6001 with a minimum grade of B
Term Offered: Spring

NURS 6004 Professional Nurse Competency
[2 credit hours]
Focus on preparation for the National council Licensure Examination for Registered Nurses NCLEX-RN, through content review and test-taking practice.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5001 with a minimum grade of B and NURS 5002 with a minimum grade of B and NURS 5003 with a minimum grade of B and NURS 5004 with a minimum grade of B and NURS 5005 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5007 with a minimum grade of B and NURS 5008 with a minimum grade of B and NURS 5009 with a minimum grade of B and NURS 5530 with a minimum grade of B and NURS 5910 with a minimum grade of B and NURS 6001 with a minimum grade of B and NURS 6002 with a minimum grade of B and INDI 6000 with a minimum grade of B
Corequisites: NURS 6003
Term Offered: Spring

NURS 6060 Psychopharmacology for PMHNP Practice
[2 credit hours]
An introductory psychopharmaceutical course for PMHNP students.
Corequisites: NURS 5690
Term Offered: Spring, Fall

NURS 6150 Contemporary Practice
[3 credit hours]
Focuses on broad concepts relevant to current nursing practice, including role development, communication with teams and as a leader and with patients and families. Billing, coding, entrepreneurship, marketing, and other aspects of advanced practice are incorporated.
Term Offered: Spring

NURS 6230 Family Nurse Practitioner Clinical III: Primary Care of Adults and Older Adults
[8 credit hours]
Focuses on primary care management of acute and chronic conditions of adults and older adults. Urgent care issues are addressed. Emphasizes integration of primary care concepts across the life span. Includes 240 clinical hours.
Prerequisites: NURS 6220 with a minimum grade of B
Term Offered: Spring

NURS 6240 Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults
[3 credit hours]
This course provides the didactic foundation to guide the acute and chronic condition management of late adolescents and young adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Term Offered: Summer, Fall

NURS 6250 Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults: Practicum 1
[4 credit hours]
Practicum 1 focuses on the management of acute illnesses in diverse populations of late adolescents and young adult patients.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6240
Term Offered: Summer, Fall

NURS 6260 Advanced Practice Nursing in Acute Care of Adults and Older Adults
[3 credit hours]
The course focuses on care of chronic, acute, and complex illnesses in adults and older adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Term Offered: Spring, Fall

NURS 6270 Advanced Practice Nursing in Acute Care of Adults and Older Adults: Practicum 2
[4 credit hours]
This course provides the didactic foundation to guide the acute-and chronic-condition management of late adolescents and young adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6260
Term Offered: Spring, Fall

NURS 6280 Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults
[2 credit hours]
The course focuses on care of chronic, acute, and complex illnesses in Older Adults and Frail Elderly.
Corequisites: NURS 6650
Term Offered: Spring, Fall

NURS 6290 Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults: Practicum 3
[5 credit hours]
Practicum focuses on the management of acute illnesses in diverse populations of older adults and frail elderly.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6280
Term Offered: Spring, Fall

NURS 6340 Advanced Practice Nursing in Psych Mental Health of Adults
[3 credit hours]
Focuses on the theory related to the primary care of acute and chronic psych mental health issues in adults and principles of health promotion and wellness.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 6060 with a minimum grade of B
Term Offered: Summer

NURS 6350 Advanced Practice Nursing in Psych Mental Health of Adults: Practicum 1
[4 credit hours]
Focus on primary care of acute and chronic psych mental health issues in adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 6060 with a minimum grade of B
Corequisites: NURS 6340
Term Offered: Summer

NURS 6360 Advanced Practice Nursing in Primary Care of Psych Mental Health of Child, Adolescent and Family
[3 credit hours]
Focus on primary care of acute and chronic psych mental health issues in children, adolescent, and families.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 6060 with a minimum grade of B
Term Offered: Fall

NURS 6370 Advanced Practice Nursing in Psych Mental Health of Child, Adolescent and Family: Practicum 2
[4 credit hours]
Focus on primary care of acute and chronic psych mental health issues in children, adolescents, and families.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 6060 with a minimum grade of B
Corequisites: NURS 6360
Term Offered: Fall

NURS 6380 Advanced Practice Nursing in Psych Mental Health of Older Adults
[2 credit hours]
Focus on primary care of acute and chronic psych mental health issues in older adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6060 with a minimum grade of B
Corequisites: NURS 6650
Term Offered: Spring

NURS 6390 Advanced Practice Nursing in Psych Mental Health of Older Adults: Practicum 3
[5 credit hours]
Focus on primary care of acute and chronic psych mental health issues in older adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6060 with a minimum grade of B
Corequisites: NURS 6380
Term Offered: Spring

NURS 6420 Acute Care Nurse Practitioner Clinical I: Acute Management of Late Adolescents and Young Adults
[8 credit hours]
The purpose of this course is to provide students with a strong foundation in clinical decision-making, role development, and procedural skills in the acute care management of diverse populations of late adolescents and young adult patients.
Prerequisites: (NURS 5400 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5740 with a minimum grade of B and INDI 6000 with a minimum grade of C) or (NURS 7400 with a minimum grade of B and NURS 7680 with a minimum grade of B and NURS 7740 with a minimum grade of B or NURS 7170 with a minimum grade of B and NURS 7690 with a minimum grade of B and INDI 8000 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

NURS 6430 Acute Care Nurse Practitioner Clinical II: Acute Management of Adults and Older Adults
[7 credit hours]
The purpose of this course is to integrate evidence-based clinical knowledge in diagnosing and acute care management of adults and older adults with complex, acute and chronic conditions.
Prerequisites: NURS 6420 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 6440 Acute Care Nurse Practitioner Clinical III: Acute Management of Older Adults and Frail Elderly
[8 credit hours]
The purpose of this course is to utilize evidence-based knowledge and advanced clinical skills in diagnosing and managing older adults and frail elderly with complex acute and chronic conditions.
Prerequisites: NURS 6430 with a minimum grade of B
Term Offered: Spring, Fall

NURS 6530 Public Policy and Health Care
[3 credit hours]
Focus on emerging trends in healthcare policy and includes content on ethical foundations, financial implications, and engagement of graduate level nurses in the development, implementation, and evaluation of healthcare policy.
Term Offered: Spring, Summer, Fall

NURS 6540 Advanced Practice Nursing in Primary Care of Adults
[3 credit hours]
Focus on primary care of common acute and chronic illnesses in adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Term Offered: Summer

NURS 6550 Advanced Practice Nursing in Primary Care of Adults: Practicum 1
[4 credit hours]
Practicum 1 focuses on primary care of acute and chronic illnesses in adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6540
Term Offered: Summer, Fall

NURS 6560 Advanced Practice Nursing in Primary Care of Families
[3 credit hours]
Focuses on the care of children, adolescents, and women across the lifespan. Emphasis is on health promotion and common acute illness.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 6750 with a minimum grade of B
Term Offered: Fall

NURS 6570 Advanced Practice Nursing in Primary Care of Families: Practicum 2
[4 credit hours]
Focus on primary care of common acute and chronic illnesses in children and women across the lifespan. Practicum experiences will incorporate women, children, adults, and target populations.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6560
Term Offered: Fall

NURS 6580 Advanced Practice Nursing in Primary Care of Older Adults
[2 credit hours]
Focuses on primary-care management of acute and chronic conditions of adults and older adults. Urgent-care issues are addressed. Emphasizes integration of primary-care concepts across the life span.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6650
Term Offered: Spring

NURS 6590 Advanced Practice Nursing in Primary Care of Older Adults: Practicum 3
[5 credit hours]
Focus on primary care of common acute and chronic illnesses in adults and older adults. Practicum experiences will incorporate adults and target populations.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6580
Term Offered: Spring

NURS 6610 Population Health for Advanced Practice Nurses
[3 credit hours]
Focus on broad concepts relevant to current advanced practice nursing, including impact of changing demographics on healthcare delivery systems, cultural assessment and competence, the social determinants of health, and social justice.
Term Offered: Spring, Summer, Fall

NURS 6650 Transition to Practice
[1 credit hour]
Focus on broad concepts relevant to current nursing practice, including role development, communication with teams and as a leader and with patients and families. Billing, coding, entrepreneurship, marketing and other aspects of advanced practice are incorporated.
Term Offered: Spring

NURS 6740 Advanced Assessment
[3 credit hours]
Focuses on acquisition of advanced skills in collection and documentation of assessment data across the life span. Differentiates normal from abnormal findings. Supervised practice and demonstrations are required.
Prerequisites: NURS 5680 with a minimum grade of B
Corequisites: NURS 6750
Term Offered: Spring

NURS 6750 Diagnostic Reasoning
[1 credit hour]
Focus on development of hypotheses that may explain an individual's clinical problem and how to apply collected information in confirming or excluding a hypothesis and generating a list of differential diagnoses.
Corequisites: NURS 6740
Term Offered: Spring

NURS 6760 Population Health Nursing: Policy, Advocacy, and Health Systems
[3 credit hours]
Focus on exploring population health nursing within the context of health policy, advocacy, and health systems. Students examine how public policy, healthcare delivery structures, and social and structural determinants influence population health outcomes. Emphasis is placed on systems-based practice, health equity, and the professional nurse's role in advocacy, policy engagement, and leadership to promote safe, effective, and equitable care across populations and lifespans.
Term Offered: Fall

NURS 6770 Health Assessment and Nursing Skills 1
[5 credit hours]
Focus on holistic assessment of diverse populations across the lifespan. Emphasis on the application of knowledge and skills through experiential and interprofessional activities, while laying the foundation for scholarly inquiry.
Term Offered: Fall

NURS 6780 Professional Socialization in Nursing
[2 credit hours]
Understanding of the professional nursing role including historical, legal, ethical, political, economic, and cultural diversity that impact nursing practice. Examine nursing theories and models of professional nursing practice.
Term Offered: Fall

NURS 6790 Nursing Care of Adults 1
[6 credit hours]
Focus on health promotion, prevention, and disease management using evidence-based practice with an emphasis on utilizing the nursing process to deliver care across the lifespan of adults.
Prerequisites: NURS 5002 with a minimum grade of B and NURS 6770 with a minimum grade of B
Term Offered: Spring

NURS 6800 Pharmacology 1 for the Graduate Entry Nurse
[2 credit hours]
Introduction to foundational pharmacologic principles essential to safe nursing practice, including pharmacokinetics, pharmacodynamics, mechanisms of action, adverse effects, and drug interactions. Emphasis is placed on life-span considerations, regulatory standards, and application of pharmacology to clinical judgment and client safety.
Prerequisites: NURS 5002 with a minimum grade of B and NURS 6770 with a minimum grade of B
Term Offered: Spring, Summer

NURS 6810 Pharmacology II for the Graduate Entry Nurse
[2 credit hours]
Building on foundational pharmacology introduced in NURS6800, this course advances the application of pharmacotherapeutic principles through clinical judgment. Emphasis is placed on evaluating therapeutic outcomes, managing high-risk medications, and preventing adverse drug events to promote client safety.
Prerequisites: NURS 6800 with a minimum grade of B and NURS 6770 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5002 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 6820 Evidence-Based Practice: Translating Research to Practice
[3 credit hours]
Focus is on the use of evidence-based literature and research to inform clinical decision-making, enhance care, and improve outcomes.
Term Offered: Spring, Summer, Fall

NURS 6830 Nursing Care of Adults II
[6 credit hours]
Focus on disease management and care of clients with complex health problems using evidence-based practice with an emphasis on utilizing the nursing process to deliver care across the lifespan of adults.
Prerequisites: NURS 5002 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 6770 with a minimum grade of B and NURS 6790 with a minimum grade of B and NURS 6800 with a minimum grade of B and NURS 6810 with a minimum grade of B
Term Offered: Fall

NURS 6840 Transition to Professional Nursing Practice
[5 credit hours]
Emphasis is placed on the synthesis of prior coursework and knowledge as students assume the role of the entry-level nurse. Students develop increasing independence in nursing practice, strengthen clinical reasoning skills, and demonstrate accountability for autonomous professional practice. The course emphasizes the application of management and leadership principles within clinical settings, preparing students to demonstrate entry-level nursing leadership, decision-making, and professional responsibility in client care and healthcare systems.
Prerequisites: NURS 5002 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5008 with a minimum grade of B and NURS 5009 with a minimum grade of B and NURS 6760 with a minimum grade of B and NURS 6770 with a minimum grade of B and NURS 6780 with a minimum grade of B and NURS 6790 with a minimum grade of B and NURS 6800 with a minimum grade of B and NURS 6810 with a minimum grade of B and NURS 6820 with a minimum grade of B and NURS 6830 with a minimum grade of B
Corequisites: NURS 6850
Term Offered: Spring

NURS 6850 RN Practice Readiness and NCLEX Review
[2 credit hours]
Focus on preparation for the National council Licensure Examination for Registered Nurses NCLEX-RN, through content review and test-taking practice.
Prerequisites: NURS 5002 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5008 with a minimum grade of B and NURS 5009 with a minimum grade of B and NURS 6760 with a minimum grade of B and NURS 6770 with a minimum grade of B and NURS 6780 with a minimum grade of B and NURS 6790 with a minimum grade of B and NURS 6800 with a minimum grade of B and NURS 6810 with a minimum grade of B and NURS 6820 with a minimum grade of B and NURS 6830 with a minimum grade of B
Corequisites: NURS 6840
Term Offered: Spring

NURS 6860 Graduate Entry Master's Nursing Capstone: Practice Integration
[1-2 credit hours]
A culminating course enables students to synthesize and apply program knowledge through the completion of a capstone project. Emphasis is on critical thinking, problem-solving, research literacy, teamwork, planning, and professional oral and written communication.
Prerequisites: NURS 6820 (may be taken concurrently) with a minimum grade of B and NURS 6860 (may be taken concurrently) with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 6890 Independent Study in Nursing
[1-4 credit hours]
The student and faculty member agree on a course of study that will enable the student to achieve his/her objectives. An Independent Study Contract and Evaluation Form are submitted to the Associate Dean of the Graduate Nursing Program. May be repeated for credit.
Term Offered: Spring, Summer, Fall

NURS 6910 Nursing Research and Practice Application
[3 credit hours]
Focus is on critically exploring research processes that generate new knowledge and informs nursing practice. Data-based literature will be evaluated to identify conceptual framework, explain statistical applications, and differentiate research methods. Appraisal of provisions to protect human subjects including completion of CITI training.
Prerequisites: INDI 6000 with a minimum grade of C
Term Offered: Spring, Summer, Fall

NURS 6990 Thesis Research
[1-3 credit hours]
Research in nursing to fulfill the research requirement of the Nursing Master's Program. The (required) 3 credit hours may be divided and repeated across semesters. Only 3 credit hours are applicable for the degree. May be repeated for credit.
Term Offered: Spring, Summer, Fall

NURS 7011 Implementation Science for Evidence-Based Practice
[3 credit hours]
This 3-credit course examines the inter-relationship between theory, research, and practice along with the nature of scientific knowledge development in nursing. Focus is on critical analysis and evaluation of theory and its use for designing evidence-based practice protocols.
Prerequisites: NURS 7400 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 7050 Information and Technology in Nursing and Health Care Systems
[3 credit hours]
Systematic assessment of clinical and administrative information needs of health care systems. Examines the technology and strategies needed to support patients, nurses, and health care delivery in dynamic environmental systems.
Term Offered: Spring, Fall

NURS 7060 Population Health
[3 credit hours]
This course uses epidemiologic models to analyze interventions for health care-delivery systems. The focus is on safe, ethical, equitable and culturally-appropriate advanced nursing practice activities to meet emerging world needs for population health.
Prerequisites: INDI 6000 with a minimum grade of B or INDI 8000 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 7110 DNP Anesthesia Residency I
[2 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge with experiential learning in simulated and real clinical environments
Term Offered: Spring

NURS 7120 DNP Anesthesia Residency II
[3 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "novice" anesthesia student for the care of the patient with minimal to no physiological derangements (PS I & IE).
Term Offered: Summer

NURS 7130 DNP Anesthesia Residency III
[3 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "advanced beginner" anesthesia student for the care of the more complex patients who may present emergently (PS II & IIE).
Term Offered: Fall

NURS 7140 DNP Anesthesia Residency IV
[4 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "competent" anesthesia student for the care of the functionally incapacitated emergent, moribund and special population and specialty procedures' patients (PS III & IIIE).
Prerequisites: NURS 7130 with a minimum grade of C
Term Offered: Summer

NURS 7150 DNP Anesthesia Residency V
[4 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "competent" anesthesia student for the care of emergent, moribund, declared brain death patient for organ harvest and special population and specialty procedures' patients (PS IV & IVE).
Prerequisites: NURS 7140 with a minimum grade of C
Term Offered: Summer

NURS 7160 DNP Anesthesia Residency VI
[4 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "proficient" anesthesia student for the care of emergent, moribund, declared brain death patient for organ harvest and special population and specialty procedures' patients (PS V, VE, & VI).
Term Offered: Fall

NURS 7170 Advanced Health Assessment for the DNP
[4 credit hours]
Focuses on acquisition of advanced skills in collection and documentation of assessment data across the life span. Differentiates normal from abnormal findings. Supervised laboratory practice is required.
Prerequisites: NURS 7680 with a minimum grade of B
Term Offered: Spring, Summer

NURS 7190 DNP Anesthesia Residency VII
[4 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "expert" anesthesia student for patients across the lifespan, special populations, and procedures.
Prerequisites: NURS 7160 with a minimum grade of C
Term Offered: Spring

NURS 7200 Transformational and Systems Leadership for the DNP
[3 credit hours]
This course examines the application of organizational and leadership theories and strategies to assess process and outcomes in a variety of health care settings. Focus is on the role of the advanced practice nurse in analyzing clinical patterns and issues in complex practice settings, health care organizations and communities.
Term Offered: Spring, Summer, Fall

NURS 7210 Family Nurse Practitioner Clinical I: Primary Care of Adolescents and Adults
[7 credit hours]
Focuses on primary care of common/chronic illness of adolescents, adults includes beginning understanding of role of APN in primary care includes development of therapeutic relationships. Clinical experiences include populations across the lifespan.
Prerequisites: NURS 7680 with a minimum grade of B and NURS 7400 with a minimum grade of B and (NURS 7740 with a minimum grade of B or NURS 7170 with a minimum grade of B)
Corequisites: NURS 7690
Term Offered: Summer

NURS 7220 Family Nurse Practitioner Clinical II: Primary Care of Women and Children
[7 credit hours]
Focuses on primary care of children/women's health. Emphasis on health promotion and common acute illness, role development,
Prerequisites: NURS 7210 with a minimum grade of B and NURS 7690 with a minimum grade of B
Term Offered: Fall

NURS 7230 Family Nurse Practitioner Clinical III: Primary Care of Adults and Older Adults
[8 credit hours]
Focuses on primary care management of acute/chronic conditions of adults/older adults. Urgent care issues are addressed. Emphasizes holistic care across the lifespan integrating primary care concepts. Explores professional APN leadership role.
Prerequisites: NURS 7220 with a minimum grade of B
Term Offered: Spring, Fall

NURS 7240 Quality, Safety and Advocacy Strategies
[3 credit hours]
Examines the principles and practice of quality management in health care organizations and clinical performance in care delivery and outcomes. Focus is on the role and accountability of the DNP prepared nurse working with a collaborative team for maintaining safety, and improving quality of care.
Term Offered: Spring, Summer, Fall

NURS 7250 Foundational Principles of Quality Improvement and Data Management for Leading Change
[3 credit hours]
Quality Improvement (QI) models and tools provide the foundation for quality improvement activities. Clinical Data Management strategies as a part of Nursing Informatics application are used as core skills to assess clinical processes and outcomes for areas of improvement.
Term Offered: Fall

NURS 7260 Principles for DNP Anesthesia 1
[3 credit hours]
The course focus is on biomedical technology – anesthesia delivery and airway equipment, physiologic monitoring, utilization and interpretation of data in clinical practice.
Term Offered: Fall

NURS 7270 Advanced Pharmacology for APRNs
[4 credit hours]
The course focus is the in-depth analysis of pharmacological precepts for clinical correlation and therapeutic pharmacologic decision-making.
Term Offered: Spring

NURS 7290 Advanced Health Assessment and Diagnostic Reasoning
[3 credit hours]
The course focuses on analysis and interpretation of assessment and diagnostic methodologies of advanced practice nursing across the lifespan.
Term Offered: Spring

NURS 7300 Advanced Physiology and Pathophysiology Across the Lifespan II
[3 credit hours]
The course focus is analysis of specific normal and abnormal human physiology for health promotion and clinical and therapeutic decision making across the lifespan
Prerequisites: NURS 7590 with a minimum grade of C
Term Offered: Spring, Summer

NURS 7340 Scientific Foundations for Anesthesia
[3 credit hours]
The course focus is on chemical, biochemical, and physics that are pertinent to human physiology, pharmacology, and biomedical equipment.
Term Offered: Summer

NURS 7350 Principles for DNP Anesthesia II
[3 credit hours]
The course focus is on the use of biomedical technology and equipment in perioperative anesthesia management, utilization and interpretation of data for safe, evidence-based care in select human normal and abnormal physiologic states for medical, surgical and diagnostic interventions .
Term Offered: Spring

NURS 7360 Advocacy and Social Policy
[3 credit hours]
This course focuses on the knowledge, skills and significance of advocacy, health policy, and health law at the local, state, national, and international levels. It includes the process of health policymaking, the impact of health policy on the health of citizens, and the role of nursing and of advanced practice nurses in the political process
Term Offered: Summer

NURS 7370 Evidence-based Practice for Advanced Nursing Practice
[3 credit hours]
This course explores advanced nursing research skills from theory to practice. The student learns how to plan, design, implement, analyze, and report nursing research that translates to advanced nursing practice. Applicable nursing research designs are examined and research methodologies are appraised for appropriateness for clinical practice. The role of the advanced practice nurse for project development in interprofessional collaboration to improve health system outcomes is explored. The course culminates with an integrative review of the literature for an identified practice problem.
Term Offered: Summer

NURS 7380 Population Health for Advanced Nursing Practice
[3 credit hours]
This course covers the fundamental elements of population health, population health management strategies, as the core understanding required for addressing health equity and disparities, social determinants of health, public health issues, and policy advocacy needed by nursing leaders. Additionally, students will apply key steps of a population health model related to conducting an assessment, intervention, and evaluation of individuals and populations. This course includes a minimum of 20 field hours.
Term Offered: Summer

NURS 7390 Principles for DNP Anesthesia III
[5 credit hours]
The course focuses on safe, evidence-based anesthesia care in select human normal and abnormal physiologic states for select medical, surgical, and diagnostic interventions.
Prerequisites: NURS 7350 with a minimum grade of C
Term Offered: Summer

NURS 7400 Theoretical Foundations of Advanced Nursing Practice
[2 credit hours]
Explores nursing as science and art. Identifies practice theory in the context of the nursing metaparadigm, grand and middle range theory with emphasis on analysis/evaluation of selected nursing theories.
Term Offered: Spring, Summer, Fall

NURS 7420 Acute Care Nurse Practitioner Clinical I: Acute Management of Late Adolescents and Young Adults
[8 credit hours]
The purpose of this course is to provide students with a strong foundation in clinical decision-making, role development, and procedural skills in the acute care management of diverse populations of late adolescents and young adult patients.
Prerequisites: (NURS 5400 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5740 with a minimum grade of B and INDI 6000 with a minimum grade of C) or (NURS 7400 with a minimum grade of B and NURS 7680 with a minimum grade of B and NURS 7740 with a minimum grade of B or NURS 7170 with a minimum grade of B and NURS 7690 with a minimum grade of B and INDI 8000 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

NURS 7430 Acute Care Nurse Practitioner Clinical II: Acute Management of Adults and Older Adults
[7 credit hours]
The purpose of this course is to integrate evidence-based clinical knowledge in diagnosing and acute care management of adults and older adults with complex, acute and chronic conditions.
Prerequisites: NURS 6420 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 7440 Acute Care Nurse Practitioner Clinical III: Acute Management of Older Adults and Frail Elderly
[8 credit hours]
The purpose of this course is to utilize evidence-based knowledge and advanced clinical skills in diagnosing and managing older adults and frail elderly with complex acute and chronic conditions.
Prerequisites: NURS 6430 with a minimum grade of B
Term Offered: Spring, Fall

NURS 7450 Regional Anesthesia and Pain Management
[4 credit hours]
The course focuses on safe, evidence-based care management in regional anesthesia, acute and chronic pain states, radiological and ultrasonography principles, and best practices in nonoperating room anesthesia experiences.
Term Offered: Fall

NURS 7460 Epidemiology
[3 credit hours]
Epidemiological principles and biostatistical methods used in the study of disease patterns are further examined. Methods are applied in the development, implementation, and evaluation of preventive healthcare services in diverse settings. Students investigate, describe, and determine causal inferences involving the distribution and determinants of morbidity and mortality. Epidemiological and statistical data are used to develop and improve healthcare delivery models for diverse population health and acute care settings.
Term Offered: Summer

NURS 7470 Principles for DNP Anesthesia IV
[3 credit hours]
The course focuses on safe, evidence-based anesthesia care in special populations' normal and abnormal physiologic states for select specialty medical, surgical, and diagnostic interventions.
Prerequisites: NURS 7390 with a minimum grade of C
Term Offered: Fall

NURS 7480 DNP NAP Project 1-Problem Identification and Literature Review
[3 credit hours]
Quality Improvement (QI) models and tools provide the foundation for quality improvement activities. Clinical Data Management strategies as a part of Nursing Informatics application are used as core skills to assess clinical processes and outcomes for areas of improvement.
Term Offered: Fall

NURS 7490 DNP NAP Project 2- Project Planning
[2 credit hours]
This online course prepares DNP students at the University of Toledo to design a rigorous translational research / evidence-based practice (EBP) project for later implementation in NURS 75205 Translational Research Project Implementation. Students identify a clinically significant practice problem, synthesize current evidence, select an appropriate theoretical or implementation framework, and develop a detailed project proposal that includes purpose, aims, methods, outcome measures, data plan, stakeholder engagement, and ethical/regulatory considerations. Successful completion results in an approved DNP project plan ready for implementation in a subsequent semester.
Prerequisites: NURS 7480 with a minimum grade of C
Term Offered: Spring

NURS 7520 DNP NAP Project 3-Implementation
[2 credit hours]
This course provides the opportunity for the student to implement and evaluate the translational research project that was planned and designed in the Translational Research Design course. This final project demonstrates synthesis of the knowledge gained throughout the DNP curriculum and lays the foundation for future scholarship in practice. Practice hours may be assigned to the scholarly project for the purpose of implementation and evaluation
Prerequisites: NURS 7490 with a minimum grade of C
Term Offered: Summer

NURS 7530 Public Policy and Health Care
[3 credit hours]
Explores the public policy process from agenda setting through program evaluation. Focus is on how health problems are brought to the attention of government and solutions are obtained. Some field work is expected.
Term Offered: Spring, Summer, Fall

NURS 7540 Advanced Pharmacology for Anesthesia
[4 credit hours]
The course focus is the in-depth analysis of pharmacological precepts for clinical correlation and therapeutic pharmacologic decision-making.
Term Offered: Fall

NURS 7550 NAP Project 4- DNP NAP Project 4 Evaluation and Dissemination
[3 credit hours]
This course reflects the culmination and synthesis of learning across the DNP program through the dissemination of the DNP scholarly project that was designed and implemented in previous DNP coursework. The student is required to present the project in a public forum.
Prerequisites: NURS 7520 with a minimum grade of C
Term Offered: Fall

NURS 7560 Synthesis of Critical Anesthesia Concepts I
[2 credit hours]
The course focus is synthesis of critical professional and practice concepts for progression into independent nurse anesthesia practice as one who accepts the duty of current practice knowledge and lifelong learning.
Term Offered: Fall

NURS 7570 Advanced Human Anatomy
[3 credit hours]
The course focus is on the structure and organization of the human body as a scientific foundation for clinical practice application.
Term Offered: Fall

NURS 7580 Synthesis of Critical Anesthesia Concepts II
[2 credit hours]
The course focus is synthesis of critical professional and practice concepts for progression into independent nurse anesthesia practice as one who accepts the duty of current practice knowledge and lifelong learning
Prerequisites: NURS 7560 with a minimum grade of C
Term Offered: Spring

NURS 7590 Advanced Physiology and Pathophysiology Across the Lifespan I
[3 credit hours]
The course focus is analysis of specific normal and abnormal human physiology for health promotion and clinical and therapeutic decision making across the lifespan
Term Offered: Fall

NURS 7610 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adult
[7 credit hours]
The first course in the Psychiatric-Mental Health Nurse Practitioner track focuses on preparing the student in the advanced practice role of assessment, diagnosis, and treatment planning of select acute and chronic psychiatric disorders and mental health care needs of individuals across the lifespan. Students will be introduced to clinical approaches and methods for assessing and evaluating adults.
Prerequisites: NURS 7050 with a minimum grade of B and NURS 7400 with a minimum grade of B and NURS 7680 with a minimum grade of B and (NURS 7740 with a minimum grade of B or NURS 7170 with a minimum grade of B)
Corequisites: NURS 7690
Term Offered: Summer

NURS 7620 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical II Child, Adolescent, Family
[7 credit hours]
Emphasis on increasing ability to assess, diagnose, and treat more complex mental health care needs of individuals and families with particular attention paid to those disorders found in childhood and adolescence.
Prerequisites: NURS 7610 with a minimum grade of B and NURS 7690 with a minimum grade of B
Term Offered: Fall

NURS 7630 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adult
[9 credit hours]
Focus on acute or chronic psychiatric or mental health issues faced by older adults and their families- dementia, delirium, and depression.
Prerequisites: NURS 7610 with a minimum grade of B and NURS 7620 with a minimum grade of B
Term Offered: Spring, Fall

NURS 7680 Advanced Physiology and Pathophysiology
[3 credit hours]
Focuses on advanced physiologic and pathophysiologic mechanisms underlying human responses to illness across ther life-span. Students will build on existing knowledge of human anatomy and physiology.
Term Offered: Spring, Fall

NURS 7690 Advanced Pharmacotherapeutics
[3 credit hours]
Focuses on advanced pharmacologic principles in decision making for pharmacotherapy. Emphasizes physiological responses to drugs, expected outcomes, adverse reactions, and potential drug interactions. Discusses professional responsibilities of prescriptive privileges.
Prerequisites: NURS 7680 with a minimum grade of B
Term Offered: Spring, Fall

NURS 7710 Advanced Pediatric Pharmacotherapeutics
[1 credit hour]
Focuses on advanced pharmacologic principles in pediatric pharmacotherapy decision making for the advanced practice as a primary care pediatric nurse practitioner. The focus in on principles of pharmacokinetics, pharmacodynamics, and evidence-based pharmacotherapeutics for the care of infants, children, adolescents, young adults.
Corequisites: NURS 7690
Term Offered: Fall

NURS 7720 Advanced Pediatric Physiology and Pathophysiology
[1 credit hour]
This course provides a scientific foundation for advanced practice as a primary care pediatric nurse practitioner. The focus in on developmental physiology and pathophysiology of infants, children, adolescents, young adults. The embryology of organs and systems of the body will be discussed from conception through birth. Alterations in the function of organs and systems of the body affecting the pediatric population will be presented.
Corequisites: NURS 7680
Term Offered: Fall

NURS 7730 Advanced Pediatric Health Assessment
[3 credit hours]
This course provides the foundation for advanced assessment skills required to practice as a primary care pediatric nurse practitioner. The focus in on the health assessment of infants, children, adolescents, young adults, and their families. A comprehensive, holistic, and developmental approach to advanced practice will focus on the specific knowledge and skills required when conducting pediatric history and physical examinations.
Term Offered: Spring

NURS 7810 Pediatric Nurse Practitioner Clinical I:Care of Children and Concepts of Wellness
[6 credit hours]
Health care for children/adolescents, principles of health promotion/wellness. Understanding of APN role in primary care, development of therapeutic relationships. Competencies in primary care for children from birth to 21 years and families.
Prerequisites: NURS 7400 with a minimum grade of B and NURS 7680 with a minimum grade of B and (NURS 7740 with a minimum grade of B or NURS 7170 with a minimum grade of B)
Corequisites: NURS 7690
Term Offered: Spring, Summer

NURS 7820 Pediatric Nurse Practitioner Clinical II: Common Acute, and Stable Chronic Illnesses
[7 credit hours]
Care of children/adolescents with an emphasis on the management of common acute and stable chronic illnesses and APN role development. Includes therapeutic communication skills development with individuasls and groups.
Prerequisites: NURS 7810 with a minimum grade of B and NURS 7690 with a minimum grade of B
Term Offered: Fall

NURS 7830 Pediatric Nurse Practitioner Clinical III: Complex Chronic Illnesses or Disabilities
[7 credit hours]
Management of complex acute/chronic conditions in children/adolescents. Holistic care for children and families including developmental concerns and disability. Explores APN leadership role. Integration of the advanced practice role.
Prerequisites: NURS 7820 with a minimum grade of B
Term Offered: Spring

NURS 7890 Independent Study
[1-4 credit hours]
An individualized academic course that is completed under supervision of a faculty member and requires approval by the Program Director. Prior to enrollment, the student and supervising faculty member will establish agreed upon learning objectives, activities, and evaluation criteria, which are documented in the course syllabus and acknowledged through required signatures.
Term Offered: Spring, Summer, Fall

NURS 7910 Advanced Research for Evidence Based Nursing Practice
[3 credit hours]
Critically evaluate published research for clinical relevance, identify a research problem, select a conceptual framework, review selected literature, and prepare a quantitative or qualitative research proposal.
Prerequisites: (NURS 5400 with a minimum grade of B and INDI 6000 with a minimum grade of C) or (NURS 7400 with a minimum grade of B and INDI 8000 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

NURS 8010 Proposal/Practicum DNP Project 1
[5 credit hours]
First of three DNP project courses to prepare student to develop a project proposal for defense.
Prerequisites: NURS 7400 with a minimum grade of B and NURS 7910 with a minimum grade of B and INDI 8000 with a minimum grade of B and NURS 7011 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 8020 Implementation/Practicum DNP Project 2
[5 credit hours]
Advance the scholarship of nursing through the implementation of a rigorous DNP project including the interpretation, analysis, and application of evidence-based practice to improve health outcomes of a focused population.
Prerequisites: NURS 8010 with a minimum grade of S
Term Offered: Spring, Summer, Fall

NURS 8030 Implementation/Practicum DNP Project 3
[5 credit hours]
Provide analysis and evaluation of strategies that facilitate knowledge dissemination in clinical and academic settings. Facilitate the student developing two scholarly manuscripts and a scholarly presentation of their DNP project.
Prerequisites: NURS 8020 with a minimum grade of S
Term Offered: Spring, Summer, Fall

NURS 8210 Management and Leadership Skills for the DNP Nurse Executive
[6 credit hours]
This course builds on core DNP leadership and management skills by focusing on the professional role of the nurse executive including their leadership potential in context of healthcare reform and transformation.
Prerequisites: NURS 7400 with a minimum grade of B and NURS 7910 with a minimum grade of B and NURS 7011 with a minimum grade of B and NURS 7530 with a minimum grade of B and NURS 7050 with a minimum grade of B and INDI 8000 with a minimum grade of B and NURS 7060 with a minimum grade of B and NURS 7200 with a minimum grade of B and NURS 7240 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 8220 Business Skills for the DNP Nurse Executive
[6 credit hours]
This course is designed to teach essential business skills necessary for the nurse executive. Business skills include financial management, human resource management strategic management, and information management and technology.
Prerequisites: NURS 8210 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 8230 Entrepreneurship Seminar for the DNP Nurse Executive
[6 credit hours]
This seminar is designed to teach entrepreneurial critical thinking skills for the identification and resolution of business problems in the healthcare setting. The course includes the design of a business plan.
Prerequisites: NURS 8220 with a minimum grade of B
Term Offered: Spring, Summer, Fall

School of Nursing Admission Requirements

Post-Baccalaureate to Doctor of NUrsing Practice (DNP)

To be eligible for admission, applicants must have:

1. Baccalaureate in Nursing (BSN) from a college/university that is accredited by a nationally recognized body for nursing education accreditation.
2. Higher education grade point average of 3.0 in undergraduate coursework. (All courses taken at all higher ed. institutions, unadjusted for grade deletion, are used in the calculation.)
3. Official transcripts from all academic institutions attended submitted through NursingCAS.
4. An appropriate unrestricted RN license/credential for the state where the student resides. Students not residing in Ohio or Michigan need to secure an additional license in one of those states before the start of their initial clinical experience and maintain the license for the duration of the program. Clinical experiences for this program can only be completed in Ohio or Michigan. The UToledo School of Nursing is accredited by the Commission on Collegiate Nursing Education (CCNE) and is a member of NC-SARA. Questions and/or complaints should be directed to the agency contact for the Ohio NC-SARA portal.
5. Personal statement which includes the following:
   a. congruence of professional career goals with outcomes of the DNP program
   b. rationale to pursue DNP education
   c. description of abilities to achieve the outcomes of the program
   d. discussion of clinical area of interest
   e. identification of anticipated challenges in meeting the outcomes of the program and how these challenges will be met
6. Undergraduate statistics course recommended but not required.
7. Current resume or curriculum vitae (CV).
8. Three recommendations completed by professional sources (master's in nursing preferred). You will enter the email address of your three references in the NursingCAS application. NursingCAS will email the reference with the link to complete.
9. Interview
10. Students accepting admission are required to authorize UToledo to obtain criminal record checks (i.e., BCII and FBI) and are responsible for fingerprinting expenses. Students must declare and document misdemeanor and/or felony offenses that occur prior to admission to the nursing program and/or during program progression. In compliance with Ohio Revised Code 4723-7 convictions will result in denial of admission to the program or dismissal after matriculation.
11. TOEFL is required for all applicants whose native language is not English based on the requirements of the UToledo College of Graduate Studies. Official results are to be sent to institutional code 1845.

Post-Master's to Doctor of Nursing Practice (DNP)

To be eligible for admission, applicants must have:

1. Master's of Science in Nursing (MSN) from a college/university that is accredited by a nationally recognized body for nursing education accreditation.
2. Higher education grade point average of 3.0 in graduate coursework. (All graduate courses taken at all higher ed. institutions, unadjusted for grade deletion, are used in the calculation.)
3. Official transcripts from all academic institutions attended submitted through NursingCAS.
4. An appropriate unrestricted RN license/credential for the state where the student resides. Students not residing in Ohio or Michigan need to secure an additional license in one of those states before the start of their initial clinical experience and maintain the license for the duration of the program. Clinical experiences for this program can only be completed in Ohio or Michigan. The UToledo School of Nursing is accredited by the Commission on Collegiate Nursing Education (CCNE) and is a member of NC-SARA. Questions and/or complaints should be directed to the agency contact for the Ohio NC-SARA portal.
5. Direct Care applicants should hold appropriate APRN credentials for the state where student plans to conduct their indirect clinical experiences.
6. Personal statement which should include the following:
   a. congruence of professional career goals with outcomes of the DNP program
   b. rationale to pursue DNP education

c. description of abilities to achieve the outcomes of the program
d. discussion of clinical area of interest
e. identification of anticipated challenges in meeting the outcomes of the program and how these challenges will be met.

7. Current resume or curriculum vitae (CV).
8. Documentation of graduate level supervised clinical hours. (Post-Master's to DNP Clinical Leadership students only)
9. Three recommendations completed by professional sources (master's in nursing preferred). You will enter the email address of your three references in the NursingCAS application. NursingCAS will email the reference with the link to complete.
10. Interview.
11. Students are required to authorize UToledo to obtain criminal record checks (i.e. BCII & FBI) and are responsible for fingerprinting expenses. Students must declare and document misdemeanor and/or felony offenses that occur prior to admission to the nursing program and/or during program progression. In compliance with Ohio Revised Code 4723-7, convictions will result in denial of admission to the program or dismissal after matriculation.

Master of Science in Nursing

ADULT Gerontology acute care nurse practitoner
Family Nurse Practitioner
Pediatric Primary CARE Nurse practitoner
Psychiatric Mental Health Nurse Practitioner

To be eligible for admission, applicants must have:

1. Baccalaureate in nursing (BSN) from a college/university that is accredited by a nationally recognized body for nursing education accreditation.
2. Higher education grade point average of 3.0 in undergraduate coursework. (All courses taken at all higher ed. institutions, unadjusted for grade deletion, are used in the calculation.)
3. Official transcripts from all academic institutions attended, one of which must state the baccalaureate earned.
4. An appropriate unrestricted RN license/credential for the state where the student resides. Students not residing in Ohio or Michigan need to secure an additional license in one of those states before the start of their initial clinical experience and maintain the license for the duration of the program. Clinical experiences for this program can only be completed in Ohio or Michigan. UToledo School of Nursing is accredited by the Commission on Collegiate Nursing Education (CCNE) and is a member of NC-SARA. Questions and/or complaints should be directed to the agency contact for the Ohio NC-SARA portal.
5. Undergraduate statistics course recommended but not required.
6. Computer competency that includes word processing skills and ability to communicate electronically.
7. Personal statement describing career goals, future plans for employment, and expectations for graduate study.
8. Current resume or curriculum vitae (CV).
9. Three recommendations completed by professional sources (master's in nursing preferred). You will enter the email address of your three references in the NursingCAS application. NursingCAS will email the reference with the link to complete.
10. TOEFL is required for international applicants.
11. Students are required to authorize UToledo to obtain criminal record checks (i.e. BCII & FBI) and are responsible for fingerprinting expenses. Students must declare and document misdemeanor and/or felony offenses that occur prior to admission to the nursing program and/or during program progression. In compliance with Ohio Revised Code 4723-7, convictions will result in denial of admission to the program or dismissal after matriculation.

GRADUATE ENTRY MASTER OF SCIENCE

To be eligible for admission, applicants must have:

1. Baccalaureate from an accredited college/university.
2. Higher education grade point average of 3.0 in undergraduate coursework or earned master's with a 3.0. (All courses taken at all higher ed. institutions, unadjusted for grade deletion, are used in the calculation.)
3. Official transcripts from all academic institutions attended, one of which must state the baccalaureate earned.
4. Completion of 6 semester credits of Human Anatomy and Physiology with a grade of "B" or higher.
5. Completion of 3 semester credits of psychology.
6. Completion of 3 semester credits of social science.
7. Personal statement describing career goals, future plans for employment, and expectations for graduate study.
8. Current resume or curriculum vitae (CV).
9. Three recommendations completed by professional sources (master's in nursing preferred). You will enter the email address of your three references in the NursingCAS application. NursingCAS will email the reference with the link to complete.
10. TOEFL is required for international applicants. Must be taken within the past 2 years.
11. Students are required to authorize UToledo to obtain criminal record checks (i.e. BCII & FBI) and are responsible for fingerprinting expenses. Students must declare and document misdemeanor and/or felony offenses that occur prior to admission to the nursing program and/or during program progression. In compliance with Ohio Revised Code 4723-7, convictions will result in denial of admission to the program or dismissal after matriculation.
12. The accelerated program is 2 years (5 consecutive semesters) in length for full-time students. Students selecting the part-time option can complete the program in 4.5 years. Both full and part-time options include one summer. Admission is one time per year in the fall.

Graduate Certificate

adult Gerontology acute care NURSE PRACTITIONER
Family Nurse Practitioner
PEDIATRIC Primary care NURSE PRACTITIONER
Psychiatric Mental Health Nurse Practitioner
To be eligible for admission, applicants must have:

1. Earned Master's of Science in Nursing degree or Doctor of Nursing Practice from a college/university that is accredited by a nationally recognized body for nursing education accreditation.
2. Higher education grade point average of 3.0 in graduate coursework. (All graduate courses taken at all higher ed. institutions, unadjusted for grade deletion, are used in the calculation.)
3. An appropriate unrestricted RN license/credential for the state where the student resides. Students not residing in Ohio or Michigan need to secure an additional license in one of those states before the start of their initial clinical experience and maintain the license for the duration of the program. Clinical experiences for this program can only be completed in Ohio or Michigan. UToledo School of Nursing is accredited by the Commission on Collegiate Nursing Education (CCNE) and is a member of NC-SARA. Questions and/or complaints should be directed to the agency contact for the Ohio NC-SARA portal.
4. Current resume or curriculum vitae (CV).
5. Three recommendations completed by professional sources (master's in nursing preferred). You will enter the email address of your three references in the NursingCAS application. NursingCAS will email the reference with the link to complete.
6. Official transcripts of all previous graduate coursework.
7. Transcripts must indicate completion at graduate level advanced pathophysiology, advanced pharmacology, and advanced health assessment with a grade of B or higher in each course.
8. Students are required to authorize UToledo to obtain criminal record checks (i.e. BCII & FBI) and are responsible for fingerprinting expenses. Students must declare and document misdemeanor and/or felony offenses that occur prior to admission to the nursing program and/or during program progression. In compliance with Ohio Revised Code 4723-7, convictions will result in denial of admission to the program or dismissal after matriculation.
9. TOEFL is required for international applicants.

Advanced Nursing Practice, Doctor Of Nursing Practice (DNP)

- Adult Gerontology Acute Care Nurse Practitioner Concentration
- Family Nurse Practitioner Concentration
- Pediatric Primary Care Nurse Practitioner Concentration
- Psychiatric Mental Health Nurse Practitioner Concentration

Adult Gerontology Acute Care Nurse Practitioner Concentration

Code	Title	Hours
DNP Core Courses		
INDI 8000	Introduction to Biostatistical Methods	3
NURS 7050	Information and Technology in Nursing and Health Care Systems	3
NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
NURS 7060	Population Health	3
NURS 7680	Advanced Physiology and Pathophysiology	3
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
NURS 7690	Advanced Pharmacotherapeutics	3
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
NURS 7170	Advanced Health Assessment for the DNP [1]	4
NURS 8010	Proposal/Practicum DNP Project 1	5
NURS 8020	Implementation/Practicum DNP Project 2	5
NURS 8030	Implementation/Practicum DNP Project 3	5
Adult Gerontology Acute Care Nurse Practitioner Track Courses		
NURS 7420	Acute Care Nurse Practitioner Clinical I: Acute Management of Late Adolescents and Young Adults [1]	8
NURS 7430	Acute Care Nurse Practitioner Clinical II: Acute Management of Adults and Older Adults [1]	7
NURS 7440	Acute Care Nurse Practitioner Clinical III: Acute Management of Older Adults and Frail Elderly [1]	8
Total Hours		**74**

[1] Advanced Health Assessment and Clinical Practicum courses include optional clinical immersion experiences that are highly recommended.

Family Nurse Practitioner Concentration

Code	Title	Hours
DNP Core Courses		
INDI 8000	Introduction to Biostatistical Methods	3
NURS 7050	Information and Technology in Nursing and Health Care Systems	3
NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
NURS 7060	Population Health	3
NURS 7680	Advanced Physiology and Pathophysiology	3
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
NURS 7690	Advanced Pharmacotherapeutics	3
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
NURS 7170	Advanced Health Assessment for the DNP [1]	4
NURS 8010	Proposal/Practicum DNP Project 1	5
NURS 8020	Implementation/Practicum DNP Project 2	5
NURS 8030	Implementation/Practicum DNP Project 3	5
Family Nurse Practitioner Track		

NURS 7210	Family Nurse Practitioner Clinical I: Primary Care of Adolescents and Adults [1]	7
NURS 7220	Family Nurse Practitioner Clinical II: Primary Care of Women and Children [1]	7
NURS 7230	Family Nurse Practitioner Clinical III: Primary Care of Adults and Older Adults [1]	8

[1] Advanced Health Assessment and Clinical Practicum courses include optional clinical immersion experiences that are highly recommended.

Pediatric Primary Care Nurse Practitioner Concentration

Code	Title	Hours
DNP Core Courses		
INDI 8000	Introduction to Biostatistical Methods	3
NURS 7050	Information and Technology in Nursing and Health Care Systems	3
NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
NURS 7060	Population Health	3
NURS 7680	Advanced Physiology and Pathophysiology	3
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
NURS 7690	Advanced Pharmacotherapeutics	3
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
NURS 7710	Advanced Pediatric Pharmacotherapeutics	1
NURS 7720	Advanced Pediatric Physiology and Pathophysiology	1
NURS 7730	Advanced Pediatric Health Assessment	3
NURS 8010	Proposal/Practicum DNP Project 1	5
NURS 8020	Implementation/Practicum DNP Project 2	5
NURS 8030	Implementation/Practicum DNP Project 3	5
Pediatric Primary Care Nurse Practitioner Track		
NURS 7810	Pediatric Nurse Practitioner Clinical I:Care of Children and Concepts of Wellness	6
NURS 7820	Pediatric Nurse Practitioner Clinical II: Common Acute, and Stable Chronic Illnesses	7
NURS 7830	Pediatric Nurse Practitioner Clinical III: Complex Chronic Illnesses or Disabilities	7
Total Hours		**72**

Psychiatric Mental Health Nurse Practitioner Concentration

Code	Title	Hours
DNP Core Courses		
INDI 8000	Introduction to Biostatistical Methods	3
NURS 7050	Information and Technology in Nursing and Health Care Systems	3
NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
NURS 7060	Population Health	3
NURS 7680	Advanced Physiology and Pathophysiology	3
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
NURS 7690	Advanced Pharmacotherapeutics	3
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
NURS 7170	Advanced Health Assessment for the DNP [1]	4
NURS 8010	Proposal/Practicum DNP Project 1	5
NURS 8020	Implementation/Practicum DNP Project 2	5
NURS 8030	Implementation/Practicum DNP Project 3	5
Psychiatric Mental Health Nurse Practitioner Track		
NURS 7610	Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adult	7
NURS 7620	Psychiatric-Mental Health Nurse Practitioner Theory and Clinical II Child, Adolescent, Family	7
NURS 7630	Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adult	9

[1] Advanced Health Assessment and Clinical Practicum courses include optional clinical immersion experiences that are highly recommended.

- Adult Gerontology Acute Care Nurse Practitioner Concentration
- Family Nurse Practitioner Concentration
- Pediatric Primary Care Nurse Practitioner Concentration
- Psychiatric Mental Health Nurse Practitioner Concentration

Adult Gerontology Acute Care Nurse Practitioner Concentration

First Term		Hours
INDI 8000	Introduction to Biostatistical Methods	3
NURS 7050	Information and Technology in Nursing and Health Care Systems	3
NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
	Hours	**8**

Second Term		
NURS 7060	Population Health	3
NURS 7680	Advanced Physiology and Pathophysiology	3
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
	Hours	**9**
Third Term		
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
NURS 7690	Advanced Pharmacotherapeutics	3
	Hours	**9**
Fourth Term		
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
NURS 7170	Advanced Health Assessment for the DNP	4
	Hours	**10**
Fifth Term		
NURS 7420	Acute Care Nurse Practitioner Clinical I: Acute Management of Late Adolescents and Young Adults	8
	Hours	**8**
Sixth Term		
NURS 7430	Acute Care Nurse Practitioner Clinical II: Acute Management of Adults and Older Adults	7
	Hours	**7**
Seventh Term		
NURS 7440	Acute Care Nurse Practitioner Clinical III: Acute Management of Older Adults and Frail Elderly	8
	Hours	**8**
Eighth Term		
NURS 8010	Proposal/Practicum DNP Project 1	5
	Hours	**5**
Ninth Term		
NURS 8020	Implementation/Practicum DNP Project 2	5
	Hours	**5**
Tenth Term		
NURS 8030	Implementation/Practicum DNP Project 3	5
	Hours	**5**
	Total Hours	**74**

Family Nurse Practitioner Concentration

Curriculum

First Term		**Hours**
NURS 7050	Information and Technology in Nursing and Health Care Systems	3
NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
INDI 8000	Introduction to Biostatistical Methods	3
	Hours	**8**
Second Term		
NURS 7060	Population Health	3
NURS 7680	Advanced Physiology and Pathophysiology	3
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
	Hours	**9**
Third Term		
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
NURS 7690	Advanced Pharmacotherapeutics	3
	Hours	**9**
Fourth Term		
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
NURS 7170	Advanced Health Assessment for the DNP	4
	Hours	**10**
Fifth Term		
NURS 7210	Family Nurse Practitioner Clinical I: Primary Care of Adolescents and Adults	7
	Hours	**7**
Sixth Term		
NURS 7220	Family Nurse Practitioner Clinical II: Primary Care of Women and Children	7
	Hours	**7**
Seventh Term		
NURS 7230	Family Nurse Practitioner Clinical III: Primary Care of Adults and Older Adults	8
	Hours	**8**
Eighth Term		
NURS 8010	Proposal/Practicum DNP Project 1	5
	Hours	**5**
Ninth Term		
NURS 8020	Implementation/Practicum DNP Project 2	5
	Hours	**5**
Tenth Term		
NURS 8030	Implementation/Practicum DNP Project 3	5
	Hours	**5**
	Total Hours	**73**

Pediatric Primary Care Nurse Practitioner Concentration

Curriculum

First Term		**Hours**
NURS 7050	Information and Technology in Nursing and Health Care Systems	3

NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
INDI 8000	Introduction to Biostatistical Methods	3
	Hours	**8**
Second Term		
NURS 7060	Population Health	3
NURS 7680	Advanced Physiology and Pathophysiology	3
NURS 7720	Advanced Pediatric Physiology and Pathophysiology	1
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
	Hours	**10**
Third Term		
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
NURS 7690	Advanced Pharmacotherapeutics	3
NURS 7710	Advanced Pediatric Pharmacotherapeutics	1
	Hours	**10**
Fourth Term		
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
NURS 7730	Advanced Pediatric Health Assessment	3
	Hours	**9**
Fifth Term		
NURS 7810	Pediatric Nurse Practitioner Clinical I:Care of Children and Concepts of Wellness	6
	Hours	**6**
Sixth Term		
NURS 7820	Pediatric Nurse Practitioner Clinical II: Common Acute, and Stable Chronic Illnesses	7
	Hours	**7**
Seventh Term		
NURS 7830	Pediatric Nurse Practitioner Clinical III: Complex Chronic Illnesses or Disabilities	7
	Hours	**7**
Eighth Term		
NURS 8010	Proposal/Practicum DNP Project 1	5
	Hours	**5**
Ninth Term		
NURS 8020	Implementation/Practicum DNP Project 2	5
	Hours	**5**
Tenth Term		
NURS 8030	Implementation/Practicum DNP Project 3	5
	Hours	**5**
	Total Hours	**72**

Psychiatric Mental Health Nurse Practitioner Concentration

Curriculum

First Term		**Hours**
NURS 7050	Information and Technology in Nursing and Health Care Systems	3
NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
INDI 8000	Introduction to Biostatistical Methods	3
	Hours	**8**
Second Term		
NURS 7060	Population Health	3
NURS 7680	Advanced Physiology and Pathophysiology	3
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
	Hours	**9**
Third Term		
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
NURS 7690	Advanced Pharmacotherapeutics	3
	Hours	**9**
Fourth Term		
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
NURS 7170	Advanced Health Assessment for the DNP	4
	Hours	**10**
Fifth Term		
NURS 7610	Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adult	7
	Hours	**7**
Sixth Term		
NURS 7620	Psychiatric-Mental Health Nurse Practitioner Theory and Clinical II Child, Adolescent, Family	7
	Hours	**7**
Seventh Term		
NURS 7630	Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adult	9
	Hours	**9**
Eighth Term		
NURS 8010	Proposal/Practicum DNP Project 1	5
	Hours	**5**
Ninth Term		
NURS 8020	Implementation/Practicum DNP Project 2	5
	Hours	**5**

Tenth Term		
NURS 8030	Implementation/Practicum DNP Project 3	5
	Hours	**5**
	Total Hours	**74**

- PLO 1. Synthesize knowledge derived from a scientific foundation in order to demonstrate expertise in advanced clinical nursing practice to improve delivery of care.
- PLO 2. Demonstrate continuous quality improvement in patient care situations while providing leadership in clinical decision making through use of information systems and technology for the improvement and transformation of healthcare.
- PLO 3. Use clinical scholarship and analytical methods to implement safe, quality improvement in administration of patient care.
- PLO 4. Encourage inter-professional collaboration and teamwork to enhance and improve population health outcomes.
- PLO 5. Engage in influencing the development and implementation of health policy that provides an interface between practice, research and policy development.

Doctor of Nursing Practice in Nurse Anesthesia

Code	Title	Hours
NURS 7340	Scientific Foundations for Anesthesia	3
NURS 7370	Evidence-based Practice for Advanced Nursing Practice	3
NURS 7460	Epidemiology	3
NURS 7510	Leadership and Economic Concepts for Advanced Practice Nurses	3
NURS 7270	Advanced Pharmacology for APRNs	4
NURS 7570	Advanced Human Anatomy	3
NURS 7590	Advanced Physiology and Pathophysiology Across the Lifespan I	3
NURS 7250	Foundational Principles of Quality Improvement and Data Management for Leading Change	3
NURS 7260	Principles for DNP Anesthesia 1	3
NURS 7540	Advanced Pharmacology for Anesthesia	4
NURS 7290	Advanced Health Assessment and Diagnostic Reasoning	3
NURS 7300	Advanced Physiology and Pathophysiology Across the Lifespan II	3
NURS 7110	DNP Anesthesia Residency I	2
NURS 7350	Principles for DNP Anesthesia II	3
NURS 7360	Advocacy and Social Policy	3
NURS 7120	DNP Anesthesia Residency II	3
NURS 7380	Population Health for Advanced Nursing Practice	3
NURS 7390	Principles for DNP Anesthesia III	5
NURS 7450	Regional Anesthesia and Pain Management	4
NURS 7130	DNP Anesthesia Residency III	3
NURS 7470	Principles for DNP Anesthesia IV	3
NURS 7480	DNP NAP Project 1-Problem Identification and Literature Review	3
NURS 7490	DNP NAP Project 2- Project Planning	2
NURS 7140	DNP Anesthesia Residency IV	4
NURS 7520	DNP NAP Project 3-Implementation	2
NURS 7150	DNP Anesthesia Residency V	4
NURS 7550	NAP Project 4- DNP NAP Project 4 Evaluation and Dissemination	3
NURS 7560	Synthesis of Critical Anesthesia Concepts I	2
NURS 7160	DNP Anesthesia Residency VI	4
NURS 7580	Synthesis of Critical Anesthesia Concepts II	2
NURS 7190	DNP Anesthesia Residency VII	4
Total Hours		**97**

First Term		**Hours**
NURS 7340	Scientific Foundations for Anesthesia	3
NURS 7370	Evidence-based Practice for Advanced Nursing Practice	3
NURS 7460	Epidemiology	3
NURS 7510	Leadership and Economic Concepts for Advanced Practice Nurses	3
	Hours	**12**
Second Term		
NURS 7270	Advanced Pharmacology for APRNs	4
NURS 7570	Advanced Human Anatomy	3
NURS 7590	Advanced Physiology and Pathophysiology Across the Lifespan I	3
NURS 7250	Foundational Principles of Quality Improvement and Data Management for Leading Change	3
NURS 7260	Principles for DNP Anesthesia 1	3
	Hours	**16**
Third Term		
NURS 7540	Advanced Pharmacology for Anesthesia	4
NURS 7290	Advanced Health Assessment and Diagnostic Reasoning	3
NURS 7300	Advanced Physiology and Pathophysiology Across the Lifespan II	3
NURS 7110	DNP Anesthesia Residency I	2
NURS 7350	Principles for DNP Anesthesia II	3
	Hours	**15**
Fourth Term		
NURS 7360	Advocacy and Social Policy	3
NURS 7120	DNP Anesthesia Residency II	3
NURS 7380	Population Health for Advanced Nursing Practice	3
NURS 7390	Principles for DNP Anesthesia III	5
	Hours	**14**
Fifth Term		
NURS 7450	Regional Anesthesia and Pain Management	4

NURS 7130	DNP Anesthesia Residency III	3
NURS 7470	Principles for DNP Anesthesia IV	3
NURS 7480	DNP NAP Project 1-Problem Identification and Literature Review	3
	Hours	**13**
Sixth Term		
NURS 7490	DNP NAP Project 2- Project Planning	2
NURS 7140	DNP Anesthesia Residency IV	4
	Hours	**6**
Seventh Term		
NURS 7520	DNP NAP Project 3-Implementation	2
NURS 7150	DNP Anesthesia Residency V	4
	Hours	**6**
Eighth Term		
NURS 7550	NAP Project 4- DNP NAP Project 4 Evaluation and Dissemination	3
NURS 7560	Synthesis of Critical Anesthesia Concepts I	2
NURS 7160	DNP Anesthesia Residency VI	4
	Hours	**9**
Ninth Term		
NURS 7580	Synthesis of Critical Anesthesia Concepts II	2
NURS 7190	DNP Anesthesia Residency VII	4
	Hours	**6**
	Total Hours	**97**

- 1. Apply scientific knowledge and psychomotor ability while providing anesthesia care.
- 2. Demonstrate safety and vigilance to protect the patient from harm.
- 3. Provide respectful, individualized and holistic anesthesia care to patients and families.
- 4. Demonstrate effective interpersonal, leadership and communication skills.
- 5. Demonstrate professionalism, integrity, accountability and responsibility in the\nadvanced practice role of the nurse anesthetist.
- 6. Utilize critical thinking and ethically sound decision-making to impact patient care.

Nurse Executive, Doctor of Nursing Practice (DNP)

Code	Title	Hours
DNP Core Courses		
INDI 8000	Introduction to Biostatistical Methods	3
NURS 7050	Information and Technology in Nursing and Health Care Systems	3
NURS 7170	Advanced Health Assessment for the DNP	4
NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
NURS 7060	Population Health	3
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
NURS 7680	Advanced Physiology and Pathophysiology	3
NURS 7690	Advanced Pharmacotherapeutics	3
NURS 8010	Proposal/Practicum DNP Project 1	5
NURS 8020	Implementation/Practicum DNP Project 2	5
NURS 8030	Implementation/Practicum DNP Project 3	5
Nurse Executive Track Required Courses		
NURS 8210	Management and Leadership Skills for the DNP Nurse Executive	6
NURS 8220	Business Skills for the DNP Nurse Executive	6
NURS 8230	Entrepreneurship Seminar for the DNP Nurse Executive	6

Curriculum

First Term		Hours
NURS 7050	Information and Technology in Nursing and Health Care Systems	3
NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
INDI 8000	Introduction to Biostatistical Methods	3
	Hours	**8**
Second Term		
NURS 7060	Population Health	3
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
NURS 7680	Advanced Physiology and Pathophysiology	3
	Hours	**9**
Third Term		
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
NURS 7690	Advanced Pharmacotherapeutics	3
	Hours	**9**
Fourth Term		
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
NURS 7170	Advanced Health Assessment for the DNP	4
	Hours	**10**
Fifth Term		
NURS 8010	Proposal/Practicum DNP Project 1	5
	Hours	**5**
Sixth Term		
NURS 8020	Implementation/Practicum DNP Project 2	5
	Hours	**5**

Seventh Term		
NURS 8030	Implementation/Practicum DNP Project 3	5
	Hours	**5**
Eighth Term		
NURS 8210	Management and Leadership Skills for the DNP Nurse Executive	6
	Hours	**6**
Ninth Term		
NURS 8220	Business Skills for the DNP Nurse Executive	6
	Hours	**6**
Tenth Term		
NURS 8230	Entrepreneurship Seminar for the DNP Nurse Executive	6
	Hours	**6**
	Total Hours	**69**

- PLO 1. Synthesize knowledge derived from a scientific foundation in order to demonstrate expertise in advanced clinical nursing practice to improve delivery of care.
- PLO 2. Demonstrate continuous quality improvement in patient care situations while providing leadership in clinical decision making through use of information systems and technology for the improvement and transformation of healthcare.
- PLO 3. Use clinical scholarship and analytical methods to implement safe, quality improvement in administration of patient care.
- PLO 4. Encourage inter-professional collaboration and teamwork to enhance and improve population health outcomes.
- PLO 5. Engage in influencing the development and implementation of health policy that provides an interface between practice, research, and policy development.

Nurse Leadership, Post Master's DNP

Code	Title	Hours
DNP Core Courses		
INDI 8000	Introduction to Biostatistical Methods	3
NURS 7050	Information and Technology in Nursing and Health Care Systems	3
NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
NURS 7060	Population Health	3
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
NURS 8010	Proposal/Practicum DNP Project 1	5
NURS 8020	Implementation/Practicum DNP Project 2	5
NURS 8030	Implementation/Practicum DNP Project 3	5

Curriculum

First Term		**Hours**
INDI 8000	Introduction to Biostatistical Methods	3
NURS 7050	Information and Technology in Nursing and Health Care Systems	3
NURS 7400	Theoretical Foundations of Advanced Nursing Practice	2
	Hours	**8**
Second Term		
NURS 7060	Population Health	3
NURS 7910	Advanced Research for Evidence Based Nursing Practice	3
	Hours	**6**
Third Term		
NURS 7011	Implementation Science for Evidence-Based Practice	3
NURS 7530	Public Policy and Health Care	3
	Hours	**6**
Fourth Term		
NURS 7240	Quality, Safety and Advocacy Strategies	3
NURS 7200	Transformational and Systems Leadership for the DNP	3
	Hours	**6**
Fifth Term		
NURS 8010	Proposal/Practicum DNP Project 1	5
	Hours	**5**
Sixth Term		
NURS 8020	Implementation/Practicum DNP Project 2	5
	Hours	**5**
Seventh Term		
NURS 8030	Implementation/Practicum DNP Project 3	5
	Hours	**5**
	Total Hours	**41**

- PLO 1. Synthesize knowledge derived from a scientific foundation in order to demonstrate expertise in advanced clinical nursing practice to improve delivery of care.
- PLO 2. Demonstrate continuous quality improvement in patient care situations while providing leadership in clinical decision making through use of information systems and technology for the improvement and transformation of healthcare.
- PLO 3. Use clinical scholarship and analytical methods to implement safe, quality improvement in administration of patient care.
- PLO 4. Encourage inter-professional collaboration and teamwork to enhance and improve population health outcomes.
- PLO 5. Engage in influencing the development and implementation of health policy that provides an interface between practice, research, and policy development.

Advanced Practice Nursing, MSN

- Adult Gerontology Acute Care Nurse Practitioner Concentration
- Family Nurse Practitioner Concentration
- Pediatric Primary Care Nurse Practitioner Concentration
- Psychiatric Mental Health Nurse Practitioner Concentration

Adult Gerontology Acute Care Nurse Practitioner Concentration

Code	Title	Hours
NURS 5680	Advanced Physiology and Pathophysiology	3
INDI 6000	Introduction to Biostatistical Methods	3
NURS 6910	Nursing Research and Practice Application	3
NURS 6530	Public Policy and Health Care	3
NURS 6610	Population Health for Advanced Practice Nurses	3
NURS 5690	Advanced Pharmacotherapeutics	3
NURS 6150	Contemporary Practice	3
NURS 6740	Advanced Assessment [1]	3
NURS 6650	Transition to Practice	1
NURS 6750	Diagnostic Reasoning	1
NURS 6240	Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults	3
NURS 6250	Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults: Practicum 1 [1]	4
NURS 6260	Advanced Practice Nursing in Acute Care of Adults and Older Adults	3
NURS 6270	Advanced Practice Nursing in Acute Care of Adults and Older Adults: Practicum 2 [1]	4
NURS 6280	Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults	2
NURS 6290	Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults: Practicum 3 [1]	5
Select one of the following:		3
NURS 5220	Capstone Seminar	
NURS 6990	Thesis Research	
NURS 5980	Comprehensive Exam in Nursing	
Total Hours		**50**

[1] Advanced Health Assessment and Clinical Practicum courses include optional clinical immersion experiences that are highly recommended.

Family Nurse Practitioner Concentration

Code	Title	Hours
NURS 5680	Advanced Physiology and Pathophysiology	3
INDI 6000	Introduction to Biostatistical Methods	3
NURS 6910	Nursing Research and Practice Application	3
NURS 6530	Public Policy and Health Care	3
NURS 6610	Population Health for Advanced Practice Nurses	3
NURS 5690	Advanced Pharmacotherapeutics	3
NURS 6150	Contemporary Practice	3
NURS 6540	Advanced Practice Nursing in Primary Care of Adults	3
NURS 6740	Advanced Assessment [1]	3
NURS 6650	Transition to Practice	1
NURS 6750	Diagnostic Reasoning	1
NURS 6550	Advanced Practice Nursing in Primary Care of Adults: Practicum 1 [1]	4
NURS 6560	Advanced Practice Nursing in Primary Care of Families	3
NURS 6570	Advanced Practice Nursing in Primary Care of Families: Practicum 2 [1]	4
NURS 6580	Advanced Practice Nursing in Primary Care of Older Adults	2
NURS 6590	Advanced Practice Nursing in Primary Care of Older Adults: Practicum 3 [1]	5
Select from one of the following:		3
NURS 5220	Capstone Seminar	
NURS 6990	Thesis Research	
NURS 5980	Comprehensive Exam in Nursing	
Total Hours		**50**

[1] Advanced Health Assessment and Clinical Practicum courses include optional clinical immersion experiences that are highly recommended.

Pediatric Primary Care Nurse Practitioner Concentration

Code	Title	Hours
NURS 6910	Nursing Research and Practice Application	3
NURS 6150	Contemporary Practice	3
NURS 6530	Public Policy and Health Care	3
NURS 6610	Population Health for Advanced Practice Nurses	3
INDI 6000	Introduction to Biostatistical Methods	3
NURS 5730	Advanced Pediatric Health Assessment	3
NURS 5690	Advanced Pharmacotherapeutics	3
NURS 5710	Advanced Pediatric Pharmacotherapeutics	1
NURS 5680	Advanced Physiology and Pathophysiology	3
NURS 5720	Advanced Pediatric Physiology and Pathophysiology	1
NURS 5810	Pediatric Nurse Practitioner Clinical I: Care of Children and Concepts of Wellness	7
NURS 5820	Pediatric Nurse Practitioner Clinical II: Acute/ Chronic	6
NURS 5830	Pediatric Nurse Practitioner Clinical III: Complex, Chronic Illnesses or Disabilities	7
Select from one of the following:		3
NURS 5220	Capstone Seminar	
NURS 6990	Thesis Research	
NURS 5980	Comprehensive Exam in Nursing	
NURS 6650	Transition to Practice	1
NURS 6750	Diagnostic Reasoning	1
Total Hours		**51**

Psychiatric Mental Health Nurse Practitioner Concentration

Code	Title	Hours
NURS 5680	Advanced Physiology and Pathophysiology	3
INDI 6000	Introduction to Biostatistical Methods	3
NURS 6910	Nursing Research and Practice Application	3
NURS 6530	Public Policy and Health Care	3
NURS 6610	Population Health for Advanced Practice Nurses	3
NURS 5690	Advanced Pharmacotherapeutics	3
NURS 6150	Contemporary Practice	3
NURS 6340	Advanced Practice Nursing in Psych Mental Health of Adults	3
NURS 6350	Advanced Practice Nursing in Psych Mental Health of Adults: Practicum 1	4
NURS 6740	Advanced Assessment [1]	3
NURS 6650	Transition to Practice	1
NURS 6750	Diagnostic Reasoning	1
NURS 6360	Advanced Practice Nursing in Primary Care of Psych Mental Health of Child, Adolescent and Family	3
NURS 6370	Advanced Practice Nursing in Psych Mental Health of Child, Adolescent and Family: Practicum 2	4
NURS 6380	Advanced Practice Nursing in Psych Mental Health of Older Adults	2
NURS 6390	Advanced Practice Nursing in Psych Mental Health of Older Adults: Practicum 3	5
NURS 6060	Psychopharmacology for PMHNP Practice	2
Select from one of the following:		3
NURS 5220	Capstone Seminar	
NURS 6990	Thesis Research	
NURS 5980	Comprehensive Exam in Nursing	
Total Hours		**52**

[1] Advanced Health Assessment and Clinical Practicum courses include optional clinical immersion experiences that are highly recommended.

- Adult Gerontology Acute Care Nurse Practitioner Concentration
- Family Nurse Practitioner Concentration
- Pediatric Primary Care Nurse Practitioner Concentration
- Psychiatric Mental Health Nurse Practitioner Concentration

Adult Gerontology Acute Care Nurse Practitioner Concentration

First Year		
First Term		**Hours**
NURS 5680	Advanced Physiology and Pathophysiology	3
INDI 6000	Introduction to Biostatistical Methods	3
	Hours	**6**
Second Term		
NURS 6910	Nursing Research and Practice Application	3
NURS 6530	Public Policy and Health Care	3
	Hours	**6**
Second Year		
First Term		
NURS 5690	Advanced Pharmacotherapeutics	3
NURS 6610	Population Health for Advanced Practice Nurses	3
	Hours	**6**
Second Term		
NURS 6150	Contemporary Practice	3
NURS 6740	Advanced Assessment	3
	Hours	**6**
Third Year		
First Term		
NURS 6240	Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults	3
NURS 6250	Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults: Practicum 1	4
NURS 6750	Diagnostic Reasoning	1
	Hours	**8**
Second Term		
NURS 6260	Advanced Practice Nursing in Acute Care of Adults and Older Adults	3
NURS 6270	Advanced Practice Nursing in Acute Care of Adults and Older Adults: Practicum 2	4
	Hours	**7**
Third Term		
NURS 6280	Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults	2
NURS 6290	Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults: Practicum 3	5
NURS 5220 or NURS 6990 or NURS 5980	Capstone Seminar or Thesis Research or Comprehensive Exam in Nursing	3
NURS 6650	Transition to Practice	1
	Hours	**11**
	Total Hours	**50**

Family Nurse Practitioner Concentration

Curriculum

Sample Full-time Plan of Study

First Term		Hours
NURS 5680	Advanced Physiology and Pathophysiology	3
INDI 6000	Introduction to Biostatistical Methods	3
	Hours	**6**
Second Term		
NURS 6530	Public Policy and Health Care	3
NURS 6910	Nursing Research and Practice Application	3
	Hours	**6**

Third Term		
NURS 5690	Advanced Pharmacotherapeutics	3
NURS 6610	Population Health for Advanced Practice Nurses	3
	Hours	**6**
Fourth Term		
NURS 6150	Contemporary Practice	3
NURS 6740	Advanced Assessment	3
	Hours	**6**
Fifth Term		
NURS 6540	Advanced Practice Nursing in Primary Care of Adults	3
NURS 6550	Advanced Practice Nursing in Primary Care of Adults: Practicum 1	4
NURS 6750	Diagnostic Reasoning	1
	Hours	**8**
Sixth Term		
NURS 6560	Advanced Practice Nursing in Primary Care of Families	3
NURS 6570	Advanced Practice Nursing in Primary Care of Families: Practicum 2	4
	Hours	**7**
Seventh Term		
NURS 6580	Advanced Practice Nursing in Primary Care of Older Adults	2
NURS 6590	Advanced Practice Nursing in Primary Care of Older Adults: Practicum 3	5
NURS 5220	Capstone Seminar	3
NURS 6650	Transition to Practice	1
	Hours	**11**
	Total Hours	**50**

Pediatric Primary Care Nurse Practitioner Concentration

Curriculum

Sample Full-time Plan of Study

First Term		**Hours**
NURS 5680	Advanced Physiology and Pathophysiology	3
NURS 5720	Advanced Pediatric Physiology and Pathophysiology	1
INDI 6000	Introduction to Biostatistical Methods	3
	Hours	**7**
Second Term		
NURS 6530	Public Policy and Health Care	3
NURS 6910	Nursing Research and Practice Application	3
	Hours	**6**
Third Term		
NURS 5690	Advanced Pharmacotherapeutics	3
NURS 6610	Population Health for Advanced Practice Nurses	3
	Hours	**6**
Fourth Term		
NURS 5710	Advanced Pediatric Pharmacotherapeutics	1
NURS 5730	Advanced Pediatric Health Assessment	3
NURS 6150	Contemporary Practice	3
NURS 6750	Diagnostic Reasoning	1
	Hours	**8**
Fifth Term		
NURS 5810	Pediatric Nurse Practitioner Clinical I: Care of Children and Concepts of Wellness	7
	Hours	**7**
Sixth Term		
NURS 5820	Pediatric Nurse Practitioner Clinical II: Acute/Chronic	6
	Hours	**6**
Seventh Term		
NURS 5830	Pediatric Nurse Practitioner Clinical III: Complex, Chronic Illnesses or Disabilities	7
NURS 6650	Transition to Practice	1
NURS 5220	Capstone Seminar	3
	Hours	**11**
	Total Hours	**51**

Psychiatric Mental Health Nurse Practitioner Concentration

Curriculum

Sample Full-time Plan of Study

First Term		**Hours**
NURS 5680	Advanced Physiology and Pathophysiology	3
INDI 6000	Introduction to Biostatistical Methods	3
	Hours	**6**
Second Term		
NURS 6530	Public Policy and Health Care	3
NURS 6910	Nursing Research and Practice Application	3
	Hours	**6**
Third Term		
NURS 5690	Advanced Pharmacotherapeutics	3
NURS 6060	Psychopharmacology for PMHNP Practice	2
NURS 6610	Population Health for Advanced Practice Nurses	3
	Hours	**8**
Fourth Term		
NURS 6150	Contemporary Practice	3
NURS 6740	Advanced Assessment	3
	Hours	**6**
Fifth Term		
NURS 6340	Advanced Practice Nursing in Psych Mental Health of Adults	3
NURS 6350	Advanced Practice Nursing in Psych Mental Health of Adults: Practicum 1	4

NURS 6750	Diagnostic Reasoning	1
	Hours	**8**
Sixth Term		
NURS 6360	Advanced Practice Nursing in Primary Care of Psych Mental Health of Child, Adolescent and Family	3
NURS 6370	Advanced Practice Nursing in Psych Mental Health of Child, Adolescent and Family: Practicum 2	4
	Hours	**7**
Seventh Term		
NURS 6380	Advanced Practice Nursing in Psych Mental Health of Older Adults	2
NURS 6390	Advanced Practice Nursing in Psych Mental Health of Older Adults: Practicum 3	5
NURS 6650	Transition to Practice	1
NURS 5220	Capstone Seminar	3
	Hours	**11**
	Total Hours	**52**

- PLO 1. Synthesize theories, concepts, and research in nursing, social, and biological sciences and humanities as the basis for practice.
- PLO 2. Integrate advanced nursing practice knowledge and skills in managing care of selected populations.
- PLO 3. Engage in the research process with an emphasis on application to advanced practice.
- PLO 4. Engage in leadership strategies that contribute to the improvement of health care delivery and influence health care policy.
- PLO 5. Integrate assessment of own learning in developing a lifelong pattern of scholarly inquiry.

Graduate Entry Master of Science in Nursing

The Graduate Entry Master's (GEM) program is designed for the person who holds a bachelor's degree or master's degree and is not a registered nurse (RN). The curriculum includes theory courses prepared by the graduate faculty within the college, as well as clinical experiences with patients in area-wide health care facilities. The GEM program positions graduates for entry into various positions within hospitals, clinics, or communities. Graduates of the GEM program are eligible to take the NCLEX-RN® licensure exam.

Code	Title	Hours
NURS 5002	Physiology and Pathophysiology I	3
NURS 5006	Physiology and Pathophysiology II	3
NURS 5008	Healthcare for Women and Children	5
NURS 5009	Mental Health and Therapeutic Communications	3
NURS 6760	Population Health Nursing: Policy, Advocacy, and Health Systems	3
NURS 6770	Health Assessment and Nursing Skills 1	5
NURS 6780	Professional Socialization in Nursing	2
NURS 6790	Nursing Care of Adults 1	6
NURS 6800	Pharmacology 1 for the Graduate Entry Nurse	2
NURS 6810	Pharmacology II for the Graduate Entry Nurse	2
NURS 6820	Evidence-Based Practice: Translating Research to Practice	3
NURS 6830	Nursing Care of Adults II	6
NURS 6840	Transition to Professional Nursing Practice	5
NURS 6850	RN Practice Readiness and NCLEX Review	2
NURS 6860	Graduate Entry Master's Nursing Capstone: Practice Integration	1-2
Total Hours		**51-52**

First Term		**Hours**
NURS 6760	Population Health Nursing: Policy, Advocacy, and Health Systems	3
NURS 6770	Health Assessment and Nursing Skills 1	5
NURS 5002	Physiology and Pathophysiology I	3
NURS 6780	Professional Socialization in Nursing	2
	Hours	**13**
Second Term		
NURS 6790	Nursing Care of Adults 1	6
NURS 5006	Physiology and Pathophysiology II	3
NURS 6800	Pharmacology 1 for the Graduate Entry Nurse	2
	Hours	**11**
Third Term		
NURS 5008	Healthcare for Women and Children	5
NURS 5009	Mental Health and Therapeutic Communications	3
NURS 6810	Pharmacology II for the Graduate Entry Nurse	2
	Hours	**10**
Fourth Term		
NURS 6820	Evidence-Based Practice: Translating Research to Practice	3
NURS 6830	Nursing Care of Adults II	6
	Hours	**9**
Fifth Term		
NURS 6840	Transition to Professional Nursing Practice	5
NURS 6850	RN Practice Readiness and NCLEX Review	2
NURS 6860	Graduate Entry Master's Nursing Capstone: Practice Integration	1-2
	Hours	**8-9**
	Total Hours	**51-52**

- PLO 1. Synthesize theories, concepts, and research in nursing, bio-psychosocial sciences, and humanities as the basis for evidence based practice;
- PLO 2. Integrate nursing knowledge and skills in designing and implementing care to individuals and populations with diverse life experiences, perspectives and backgrounds;
- PLO 3. Engage in scholarly inquiry to advance the profession of nursing and healthcare;

- PLO 4. Engage in leadership strategies that contribute to the improvement of health care delivery and influence health care policy; and
- PLO 5. Design strategies to promote lifelong learning to incorporate professional nursing standards and accountability for practice.

Graduate Certificate: Adult Gerontology Acute Care Nurse Practitioner Program

The Adult Gerontology Acute Care Nurse Practitioner (AGACNP) Graduate Certificate is offered to individuals who have completed a master's degree in nursing or doctorate in nursing practice, with a minimum one year of full time, current work experience in acute care and/or critical care, who desire to obtain specialized knowledge to seek certification as an AGACNP. AGACNP graduates are eligible to sit for the American Nurses Credentialing Center (ANCC) certification or American Association of Critical Care Nursing (AACN) certification. The curriculum is 21 semester credits, three-semesters with a part-time option.

On admission, a gap analysis of transcripts and course syllabi for equivalency of content in advanced pathophysiology, advanced pharmacology, advanced assessment and diagnostic reasoning. A grade of B or better is required for the equivalent courses. Students who have not completed courses with the content will be admitted and required to complete them prior to beginning the clinically focused courses.

Code	Title	Hours
NURS 6240	Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults	3
NURS 6250	Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults: Practicum 1 [1]	4
NURS 6260	Advanced Practice Nursing in Acute Care of Adults and Older Adults	3
NURS 6270	Advanced Practice Nursing in Acute Care of Adults and Older Adults: Practicum 2 [1]	4
NURS 6280	Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults	2
NURS 6290	Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults: Practicum 3 [1]	5
Total Hours		**21**

[1] Advanced Health Assessment and Clinical Practicum courses include optional clinical immersion experiences that are highly recommended.

First Year		
First Term		**Hours**
NURS 6240	Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults	3
NURS 6250	Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults: Practicum 1	4
	Hours	**7**
Second Term		
NURS 6260	Advanced Practice Nursing in Acute Care of Adults and Older Adults	3
NURS 6270	Advanced Practice Nursing in Acute Care of Adults and Older Adults: Practicum 2	4
	Hours	**7**
Third Term		
NURS 6280	Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults	2
NURS 6290	Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults: Practicum 3	5
	Hours	**7**
	Total Hours	**21**

- PLO 1. Synthesize theories, concepts, and research in nursing, social, and biological sciences and humanities as the basis for practice.
- PLO 2. Integrate advanced nursing practice knowledge and skills in managing care of selected populations.
- PLO 3. Engage in the research process with an emphasis on application to advanced practice.
- PLO 4. Engage in leadership strategies that contribute to the improvement of health care delivery and influence health care policy.
- PLO 5. Integrate assessment of own learning in developing a lifelong pattern of scholarly inquiry.

Graduate Certificate: Family Nurse Practitioner

The Family Nurse Practitioner (FNP) Graduate Certificate is offered to individuals who have completed a master's degree in nursing or doctorate in nursing practice, and who desire to obtain specialized knowledge to seek certification as an FNP. FNP graduates are eligible to sit for the American Nurses Credentialing Center (ANCC) certification or American Academy of Nurse Practitioner (AANP) certification corresponding to their population foci upon graduation. The curriculum is 21 semester credits, three-semesters with a part-time option.

On admission, a gap analysis of transcripts and course syllabi for equivalency of content in advanced pathophysiology, advanced pharmacology, advanced assessment and diagnostic reasoning. A grade of B or better is required for the equivalent courses. Students who have not completed courses with the content will be admitted and required to complete them prior to beginning the clinically focused courses.

Code	Title	Hours
NURS 6540	Advanced Practice Nursing in Primary Care of Adults	3
NURS 6550	Advanced Practice Nursing in Primary Care of Adults: Practicum 1 [1]	4
NURS 6560	Advanced Practice Nursing in Primary Care of Families	3
NURS 6570	Advanced Practice Nursing in Primary Care of Families: Practicum 2 [1]	4
NURS 6580	Advanced Practice Nursing in Primary Care of Older Adults	2

NURS 6590	Advanced Practice Nursing in Primary Care of Older Adults: Practicum 3 [1]	5
Total Hours		**21**

[1] Advanced Health Assessment and Clinical Practicum courses include optional clinical immersion experiences that are highly recommended.

Curriculum

First Term		**Hours**
NURS 6540	Advanced Practice Nursing in Primary Care of Adults	3
NURS 6550	Advanced Practice Nursing in Primary Care of Adults: Practicum 1	4
	Hours	**7**
Second Term		
NURS 6560	Advanced Practice Nursing in Primary Care of Families	3
NURS 6570	Advanced Practice Nursing in Primary Care of Families: Practicum 2	4
	Hours	**7**
Third Term		
NURS 6580	Advanced Practice Nursing in Primary Care of Older Adults	2
NURS 6590	Advanced Practice Nursing in Primary Care of Older Adults: Practicum 3	5
	Hours	**7**
	Total Hours	**21**

Transcripts must indicate completion at the graduate level of advanced pathophysiology, advanced pharmacology and advanced health assessment with a grade of B or higher in each course.

- PLO 1. Synthesize knowledge derived from a scientific foundation in order to demonstrate expertise in advanced clinical nursing practice to improve delivery of care.
- PLO 2. Demonstrate continuous quality improvement in patient care situations while providing leadership in clinical decision making through use of information systems and technology for the improvement and transformation of health care.
- PLO 3. Use clinical scholarship and analytical methods to implement safe, quality improvement in administration of patient care.
- PLO 4. Encourage interprofessional collaboration and teamwork to enhance and improve population health outcomes.
- PLO 5. Engage in influencing the development and implementation of health policy that provides an interface between practice, research and policy development.

Graduate Certificate in Pediatric Primary Care Nurse Practitioner

The Primary Care Pediatric Nurse Practitioner (PPCNP) Graduate Certificate is offered to individuals who have completed a master's degree in nursing or doctorate in nursing practice, and who desire to obtain specialized knowledge to seek certification as a PPCNP. PPCNP graduates are eligible to sit for Pediatric Nursing Certification Board (PNCB) certification upon graduation. The curriculum is 20 semester credits, three-semesters with a part-time option; clinical sequence offered every other year.

On admission, a gap analysis of transcripts and course syllabi for equivalency of content in advanced pathophysiology, advanced pharmacology, advanced assessment and diagnostic reasoning. A grade of B or better is required for the equivalent courses. Students who have not completed courses with the content will be admitted and required to complete them prior to beginning the clinically focused courses.

Code	Title	Hours
NURS 5810	Pediatric Nurse Practitioner Clinical I: Care of Children and Concepts of Wellness	7
NURS 5820	Pediatric Nurse Practitioner Clinical II: Acute/ Chronic	6
NURS 5830	Pediatric Nurse Practitioner Clinical III: Complex, Chronic Illnesses or Disabilities	7
Total Hours		**20**

- PLO 1. Synthesize theories, concepts, and research in nursing, social, and biological sciences and humanities as the basis for practice.
- PLO 2. Integrate advanced nursing practice knowledge and skills in managing care of selected populations.
- PLO 3. Engage in the research process with an emphasis on application to advanced practice.
- PLO 4. Engage in leadership strategies that contribute to the improvement of health care delivery and influence health.
- PLO 5. Integrate assessment of own learning in developing a lifelong pattern of scholarly inquiry.

Graduate Certificate: Psychiatric Mental Health Nurse Practitioner

The Psychiatric Mental Health Nurse Practitioner (PMHNP) Graduate Certificate is offered to individuals who have completed a master's degree in nursing or doctorate in nursing practice and who desire to obtain specialized knowledge to seek certification as a PMHNP. PMHNP graduates are eligible to sit for the American Nurses Credentialing Center (ANCC) certification corresponding to their population foci upon graduation. The curriculum is 21 semester credits, three-semesters with a part-time option.

On admission, a gap analysis of transcripts and course syllabi for equivalency of content in advanced pathophysiology, advanced pharmacology, advanced assessment and diagnostic reasoning. A grade of B or better is required for the equivalent courses. Students who have not completed courses with the content will be admitted and required to complete them prior to beginning the clinically focused courses.

Code	Title	Hours
NURS 6340	Advanced Practice Nursing in Psych Mental Health of Adults	3
NURS 6350	Advanced Practice Nursing in Psych Mental Health of Adults: Practicum 1	4
NURS 6360	Advanced Practice Nursing in Primary Care of Psych Mental Health of Child, Adolescent and Family	3
NURS 6370	Advanced Practice Nursing in Psych Mental Health of Child, Adolescent and Family: Practicum 2	4
NURS 6380	Advanced Practice Nursing in Psych Mental Health of Older Adults	2
NURS 6390	Advanced Practice Nursing in Psych Mental Health of Older Adults: Practicum 3	5
NURS 6060	Psychopharmacology for PMHNP Practice	2
Total Hours		**23**

First Term		Hours
NURS 6340	Advanced Practice Nursing in Psych Mental Health of Adults	3
NURS 6350	Advanced Practice Nursing in Psych Mental Health of Adults: Practicum 1	4
NURS 6060	Psychopharmacology for PMHNP Practice	2
	Hours	**9**
Second Term		
NURS 6360	Advanced Practice Nursing in Primary Care of Psych Mental Health of Child, Adolescent and Family	3
NURS 6370	Advanced Practice Nursing in Psych Mental Health of Child, Adolescent and Family: Practicum 2	4
	Hours	**7**
Third Term		
NURS 6380	Advanced Practice Nursing in Psych Mental Health of Older Adults	2
NURS 6390	Advanced Practice Nursing in Psych Mental Health of Older Adults: Practicum 3	5
	Hours	**7**
	Total Hours	**23**

Transcripts must indicate completion at the graduate level of advanced pathophysiology, advanced pharmacology and advanced health assessment with a grade of B or higher in each course.

- PLO 1. Synthesize theories, concepts, and research in nursing, social, and biological sciences and humanities.
- PLO 2. Integrate advanced nursing practice knowledge and skills in managing care of selected populations.
- PLO 3. Engage in the research process with an emphasis on application to advanced practice.

- PLO 4. Engage in leadership strategies that contribute to the improvement of health care delivery and influence health.
- PLO 5. Integrate assessment of own learning in developing a lifelong pattern of scholarly inquiry.

College of Law

Graduate Catalog 2026-2027

Administration

Rebecca Zietlow

Dean and Distinguished University Professor
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Dean Zietlow's Faculty Page (https://www.utoledo.edu/law/faculty/fulltime/zietlow.html)

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Rick Goheen
Assistant Dean for the LaValley Law Library and Associate Professor of Law
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Graduate Degrees/Certificates Offered

- J.D./M.B.A. Dual Degree
- J.D./Engineering (p. 10) graduate programs
- Joint Program in Law and Disability Studies (https://www.utoledo.edu/law/academics/joint-degrees/disability-studies.html)
- J.D./M.D (https://www.utoledo.edu/med/jdmd/overview.html)

College Policies (Graduate Handbook)

3364-80-01 Law Student Handbook (http://www.utoledo.edu/law/studentlife/resources/handbook_policies/conduct.html)
3364-80-02 College of Law Academic Rules (http://www.utoledo.edu/law/studentlife/resources/pdf/academic-rules.pdf)

College Of Graduate Studies

- College of Graduate Studies (p. 407)
- College Policies and Procedures and Handbook (p. 407)
- Academic Regulations (p. 412)
- Graduate Academic Policies (https://www.utoledo.edu/policies/academic/graduate/)

Grading

College of Law Grading policies can be found here (https://www.utoledo.edu/law/studentlife/resources/pdf/academic-rules.pdf).

A student is entitled to enroll in graduate level courses in other colleges of the University for up to six semester hours of credit towards fulfillment of the requirements of the J.D. degree if the student: (i) has completed at least 30 hours of credit in the College; (ii) is not academically deficient; (iii) has obtained a faculty member's recommendation that the specific course(s) sought is relevant to the student's program at the College of Law; and (iv) has obtained the permission of the Dean of the College of Law and the college or department offering the course.

College of Medicine & Life Sciences

Graduate Catalog 2026-2027

Mission

The University of Toledo College of Medicine and Life Sciences is dedicated to improving health in the communities and region we serve. We do this by educating excellent clinicians and scientists, by providing high-quality patient care and conducting nationally recognized research.

The College of Medicine and Life Sciences offers a world-class education with medical degrees, dual degree programs, graduate degrees and graduate certificates.

Our state-of-the-art Interprofessional Immersive Simulation Center (http://www.utoledo.edu/centers/iisc/) reflects today's reality of medicine. Students in differing specialties are learning the importance of interdisciplinary teamwork and collaboration. The three-story, 65,000-square-foot facility is the first in the nation to incorporate three integrated simulation centers: a progressive anatomy and surgical skills center, an advanced clinical simulation center, and a virtual immersive reality center.

Vision

The University of Toledo College of Medicine and Life Sciences, with its partner ProMedica, is nationally recognized for education and focused research, and regionally distinguished for comprehensive clinical care.

Dr. Imran Ali
Dean, College of Medicine and Life Sciences

Health Science Campus
MD Programs
419.383.3680
medadmissions@utoledo.edu

College of Graduate Studies
419.530.4723
graduateonlineapplication@utoledo.edu

Graduate Degrees/Certificates Offered

Graduate Degrees Offered

Doctor of Philosophy in Biomedical Science

- Cell and Cancer Biology (https://catalog.utoledo.edu/graduate/medicine-life-sciences/departments-divisions/cancer-biology/phd-biomedical-sciences/)
- Molecular Medicine (p. 159)
- Medical Microbiology and Immunology (p. 162)
- Neuroscience and Neurological Disorders (p. 157)

Doctor of Philosophy in Biomedical Engineering

See College of Engineering (p. 7) catalog.

Master of Science in Biomedical Sciences

- Assistant in Pathology (p. 163)
- Clinical Research (p. 166)
- Molecular Medicine (p. 167)
- Medical Microbiology and Immunology (p. 169)
- Transplantation & Donation Sciences (Professional Science Masters) (p. 171)
- Medical Physics (p. 172)
- Medical Sciences (p. 174)
- Oral Biology (p. 176)
- Physician Assistant Studies (p. 178)

Dual Degrees

- Doctor of Medicine and Doctor of Philosophy in Biomedical Sciences (MD/PhD) (https://www.utoledo.edu/med/mdphd/)
  - Prospective students should apply to the MD Program in the College of Medicine & Life Sciences and indicate the MD/PhD track on the application.
- Doctor of Medicine and Master of Science in Biomedical Sciences (MD/MSBS) (https://www.utoledo.edu/med/grad/biomedical/md-ms-program.html)
  - Prospective students should apply to the MD Program in the College of Medicine & Life Sciences and indicate the MD/MSBS track on the application.
- Doctor of Medicine and Master of Public Health (MD/MPH) (https://www.utoledo.edu/hhs/master-of-public-health/prospective-students/dualdegree.html)
  - Prospective students should apply for admission to both the MD Program in the College of Medicine & Life Sciences and the Master of Public Health through the College of Graduate Studies and must meet the admission requirements for both programs.
- Doctor of Medicine and Master of Science in Occupational Health (MD/MSOH (https://www.utoledo.edu/hhs/master-of-public-health/prospective-students/dualdegree.html))
  - Prospective students should apply for admission to both the MD Program in the College of Medicine & Life Sciences and the Master of Science in Occupational Health through the College of Graduate Studies and must meet the admission requirements for both programs.
- Doctor of Medicine and Master of Business Administration (MD/MBA) (https://catalog.utoledo.edu/graduate/business-innovation/departments-schools/dual-degrees/md-mba-dual-degree/#text)
  - Prospective students should apply for admission to both the MD Program in the College of Medicine & Life Sciences and Master of in the College of Business and Innovation and must meet the admission requirements for both programs.
- Doctor of Medicine and Doctor of Jurisprudence (JD/MD) (https://www.utoledo.edu/med/jdmd/)
  - Prospective students should apply for admission to both the MD Program in the College of Medicine & Life Sciences and the College of Law and must meet the admission requirements for both programs.
- Doctor of Medicine and Doctoral of Philosophy in Biomedical Engineering (MD/PhD BME) (https://www.utoledo.edu/engineering/bioengineering/graduate/programs/phd_bme.html)
  - Prospective students should apply for admission to both the MD Program in the College of Medicine & Life Sciences and

the College of Engineering and must meet the admission requirements for both programs.

Graduate Certificates

- Graduate Certificate in Bioinformatics Proteomics/Genomics (p. 180)
- Graduate Certificate in Clinical Bioinformatics
- Graduate Certificate in Pathology for Post Second Year Medical Students (p. 182)

Accreditation

Graduate programs are accredited either by discipline-specific accrediting agencies or by the Higher Learning Commission of the North Central Association.

General Admission Standards

To be admitted to the Ph.D. or Master of Science in Biomedical Sciences (MSBS) research program, applicants must hold an earned baccalaureate (or equivalent) from an accredited college or university, and have a minimum overall GPA of 3.0 on a 4.0 scale. Typically, applicants will have an undergraduate major in biology or a related discipline. Applicants must have taken upper division courses in biology, chemistry and biochemistry or equivalents and earned grades of C or higher. For international applicants, a test of English language proficiency is required. Scores from The Test of English as a Foreign Language (TOEFL) are accepted and a minimum iBT score of 80, or pBT score of 550 is required. Scores from The International English Language Testing Service (IELTS) are also accepted and a minimum score of 6.5 is required. Also accepted is a PTE of 58 or higher or Duolingo of 110 or higher. Official transcripts are required from all colleges and universities attended. International applicants must submit a Foreign Credential Evaluation of their transcripts. A prior Masters degree is not required to enter the PhD program.

Scholarships

At this time, all students accepted without provisions into the PhD in Biomedical Sciences program and maintaining good academic standing will receive a full tuition scholarship, a research stipend and health insurance. There are a limited number of tuition scholarships and stipends available for students in the Masters in Biomedical Sciences programs.

Ph.D in Biomedical Science - Neuroscience & Neurological Disorders Track

Robert Smith, MD, PhD, Chair
Arun Anantharam, PhD, Track Director

The combination of molecular biology and genetics with modern neuroanatomical techniques is transforming both our ability to examine and to understand the nervous system. Ongoing research by the faculty in the Neuroscience and Neurological Disorders graduate program is providing insights into neurotransmission, sensory system function, development and plasticity of the nervous system, regeneration and repair following neural damage, the basis of neural disease, and behavior. As one of five biomedical science degree programs in the University of Toledo, College of Medicine & Life Sciences, the Neuroscience and Neurological Disorders program is an interdisciplinary course of studies whose primary goal is to train students for independent, creative careers in biomedical research and/or teaching. The program currently awards the PhD in Biomedical Sciences degree and participates in the MD/PhD combined degree program. Nationally-recognized, NIH-funded Neuroscience faculty who serve as research mentors are drawn from a number of departments including: Neurosciences, Neurology, Physiology and Pharmacology, and Psychiatry. Modern, state-of-the-art research laboratory and core facilities are available through the program and these participating departments.

The curriculum for the PhD degree consists of a core of concentrated course work in the first year, followed by specialized elective courses and an emphasis on laboratory research. Elective courses are offered in developmental and systems neuroscience, as well as ion channel function, sensory physiology, and neuropharmacology. During the first two semesters, each student rotates through three research laboratories, conducting short-term projects, gaining exposure to techniques and identifying potential areas for further investigation. During the second semester, each student selects a major advisor who directs the student's doctoral research. A faculty committee is also jointly chosen by the student and advisor to supervise academic progress toward completion of the PhD degree. In addition to 90 credit hours in didactic and research courses, PhD students are required to successfully pass a qualifying exam that consists of independently writing and defending an NIH-style grant proposal.

For admission to the Neuroscience and Neurological Disorders (NND) Ph.D. program, the applicant must have completed an undergraduate major in Biology or a related field. Students must have taken at least one upper level course in biology, chemistry, biochemistry and college-level math. The minimum acceptable GPA for admission is 3.0. International students must also present evidence of a test of English Language proficiency. Scores from The Test of English as a Foreign Language (TOEFL) are acceptable and a minimum iBT score of 80, or pBT score of 550 is required. Scores from The International English Language Testing Service (IELTS) are also accepted and a minimum score of 6.5 is required. A foreign credential evaluation (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fgraduate%2Fadmission%2Fforeign-credentialing%2Findex.html&data=05%7C02%7CKandace.Williams%40utoledo.edu%7C81fcd8b49d0f4bce063508de90152d2d%7C1d6b1707baa94a3da8f8deabfb3d467b%7C0%7C0%7C639106617776742213%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIwLjAuMDAwMCIsIlAiOiJXa%3D%3D%7C0%7C%7C%7C&sdata=xEOx05On7DPht78ulUbaGJl7LKNg361nMGaFTvejVf0%3D&reserved=0) required for all applicants who have completed coursework or degrees at non-US institutions. GRE and MCAT scores can be considered but are not required for admission.

The minimum number of credits required for PhD is 90, with a minimum of 20 credits of didactic coursework (letter grade), and a minimum of 30 credits of dissertation research. The rest of the credits are approved electives and research in the NND track.

Code	Title	Hours
BMSP 6000	Entering Research	1
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	1
BMSP 6470	System Pathophysiology	4
BMSP 6350	Cell Biology & Signaling	3
NNDP 6500	Seminar in Neuroscience	0
BMSP 5320	Statistical Methods I	3
INDI 6020	On Being a Scientist	1
NNDP 8500	Seminar in Neuroscience	1
NNDP 8540	Journal Paper Review Neuroscience	2
NNDP 8990	Research in Neuroscience	1-15
NNDP 9990	Dissertation Research in NNDP	45-53
Total Hours		**68-90**

The minimum number of credits required for PhD is 90, with a minimum of 20 credits of didactic coursework (letter grade), and a minimum of 30 credits of dissertation research. The rest of the credits are approved electives and research in the NND track.

Code	Title	Hours
FIRST TERM		9 credits
Introduction to Biomedical Research [1]		0
Current Problems and Research Approaches (CPRA) in:		
BMSP 6000	Entering Research	1
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	3
NNDP 6500	Seminar in Neuroscience [1]	0

Code	Title	Hours
SECOND TERM		9 credits
BMSP 6350	Cell Biology & Signaling	3
BMSP 6390	Mentored Research	1
BMSP 6470	System Pathophysiology	4
NNDP 6500	Seminar in Neuroscience [1]	0
NNDP 8540	Journal Paper Review Neuroscience [1]	1

Code	Title	Hours
THIRD TERM		6 credits
BMSP 5320	Statistical Methods I	3
INDI 6020	On Being a Scientist	1
NNDP 8990	Research in Neuroscience	1-15

Code	Title	Hours
FOURTH TERM		9 credits
NNDP 8500	Seminar in Neuroscience [1]	1
NNDP 8990	Research in Neuroscience	1-15

Code	Title	Hours
FIFTH TERM		9 credits
NNDP 8500	Seminar in Neuroscience [1]	1
NNDP 8540	Journal Paper Review Neuroscience [1]	2
BMSP 8250	Grant Writing Workshop (elective)	0 or 2
NNDP 9990	Dissertation Research in NNDP	1-5

Code	Title	Hours
SIXTH TERM		6 credits
NNDP 9990	Dissertation Research in NNDP	6

Code	Title	Hours
SEVENTH TERM		9 credits
NNDP 9990	Dissertation Research in NNDP	1-15
NNDP 8500	Seminar in Neuroscience [1]	1

Code	Title	Hours
EIGHTH TERM		9 credits
NNDP 8500	Seminar in Neuroscience [1]	1
NNDP 9990	Dissertation Research in NNDP	6
NNDP 8540	Journal Paper Review Neuroscience [1]	2

Code	Title	Hours
NINTH TERM		6 credits
NNDP 9990	Dissertation Research in NNDP	6

[1] Required

PhD Program Students: Year 4 and Beyond

Code	Title	Hours
Fall/Spring Term (9 credits each, Summer (6 credits)		
NNDP 9990	Dissertation Research in NNDP	6-9
NNDP 8540	Journal Paper Review Neuroscience [1]	1-2
NNDP 8500	Seminar in Neuroscience [1]	1

PhD Program Students: Year 5 and Beyond

Code	Title	Hours
Fall, Spring and Summer Semesters (1 credit all semesters)		
NNDP 9990	Dissertation Research in NNDP	1

- PLO 1. Identify and summarize the structure and function of cells, tissues, and organs.
- PLO 2. Describe the molecular, biochemical, and cellular mechanisms that maintain the normal function, development, and plasticity of cells, tissues, and organs.
- PLO 3. Summarize basic disease causes and processes that affect the structure and function of cells, tissues, and organs.
- PLO 4. Assess and critically analyze relevant basic science and clinical literature.
- PLO 5. Design and conduct applicable biomedical sciences experiments.
- PLO 6. Organize, interpret and summarize results of applicable biomedical sciences experiments.
- PLO 7. Demonstrate ethical and responsible conduct in research and all other scholarly activities consistent with the University of Toledo, Health Science Campus, Standards of Conduct (Policy 01-027).
- PLO 8. K1 Demonstrate knowledge of normal structure and function of the body and its major organ systems, with emphasis on the peripheral and central nervous system.
- PLO 9. K2 Demonstrate knowledge of molecular, biochemical, and cellular mechanisms which are important in homeostatic maintenance of normal nervous system function.
- PLO 10. K3 Demonstrate knowledge of the basic neurophysiology of excitable membranes.
- PLO 11. K4 Demonstrate knowledge of neurophysiological basis of behavior in health and disease.
- PLO 12. K5 Demonstrate knowledge of classical and contemporary models of changes in nervous system function in response to changes in intrinsic or extrinsic environmental stimuli throughout the lifespan.
- PLO 13. K6 Demonstrate knowledge of nervous system structure and function in normal and disease states as studied with contemporary techniques and related translational research approaches.
- PLO 14. K7 Demonstrate knowledge of pathophysiology of prominent neurological disorders (e.g.. cognitive disorders, movement disorders, neurodevelopmental disorders, seizure disorder, substance use disorders).
- PLO 15. K8 Demonstrate knowledge of basic principles of pharmacology (drug action) and pharmacology of specific drugs and toxins used in basic neuroscience research, in vino and in vitro, and in the treatment of prominent neurological disorders.
- PLO 16. K9 Demonstrate knowledge of the use of statistical methods in the appropriate design, analysis and interpretation of research projects.
- PLO 17. K10 Demonstrate knowledge of tech principles that govern ethical and legal decision making in the design and conduct of research projects, and the accurate reporting of the results.
- PLO 18. K11 Demonstrate knowledge of the various approaches to the organization and financing of biomedical research projects.
- PLO 19. S1 Demonstrate the ability to perform selected basic laboratory procedures that are commonly used in the laboratories of most track faculty.
- PLO 20. S2 Demonstrate the ability to perform advanced/specialized procedures that are necessary for the completion of the student's assigned dissertation research projects (s).
- PLO 21. S3 Demonstrate the ability to design and complete independent research projects, and the ability to perform productively as a member of a research team.
- PLO 22. S4 Demonstrate the ability to communicate effectively, both orally and in writing, with colleagues, faculty, scientific journal editors/reviewers, and research granting agencies.
- PLO 23. S5 Demonstrate the ability to retrieve (from electronic databases and other sources), manage, and utilize biomedical information for solving problems that are relevant to the appropriate completion of a research project, and the accurate reporting of the results.
- PLO 25 P2 Demonstrate the ability to present their results at local, national, and international meetings, as well as to be able to organize and chair local meetings.
- PLO 24 P1 Demonstrate honesty and integrity in all interactions with colleagues, research subjects, and others with whom students may interact in their professional lives.

Ph.D in Biomedical Science - Molecular Medicine

The Molecular Medicine (MOME) track (formerly Cardiovascular and Metabolic Diseases) in the Biomedical Sciences Graduate program at The University of Toledo College of Medicine & Life Sciences on the Health Science Campus nurtures students and provides them with the necessary tools to pursue an independent career in biomedical sciences. The program encompasses a unique interdisciplinary approach to train students to conduct research in the underlying molecular mechanisms of diseases that have profound impact on human health.

The program draws on faculty research strengths in signal transduction, genetics, molecular and cellular biology, gene microarrays, genomics, proteomics, gene knockout and transgenics, tissue culture, and protein and carbohydrate biochemistry. The MOME faculty members are not only drawn from its associated department, the Department of Physiology and Pharmacology, and from the Center for Diabetes and Endocrine Research (CeDER), but also from other departments including the Departments of Medicine and Orthopedic Surgery. Modern, well-equipped research facilities are available through the participating departments. The MOME program offers degrees of Doctor of Philosophy (PhD) and Masters in Biomedical Sciences (MSBS). The program also offers these graduate degrees in combination with the Medical Degree (MD) that is offered by the medical school. Students from the four programs, PhD, MSBS, MD/PhD and MD/MSBS, follow a well-defined program that includes core courses, journal clubs, seminars, laboratory rotations, independent research, and electives in the area of interest. Students select faculty advisors and begin their independent dissertation research following the laboratory rotations in the biomedical science core curriculum. The curriculum is designed to enable students, guided by their advisors, to develop the expertise that prepares them for a successful career in research and education.

To be admitted to the Ph.D. or Master of Science in Biomedical Sciences (MSBS) Program, applicants must have a baccalaureate (or equivalent) from an accredited college or university and a minimum overall GPA of 3.0 on a 4.0 scale. Typically, applicants will have an undergraduate major in Biology or a related discipline. Applicants must have taken upper division biology, chemistry and biochemistry, or equivalent

courses, with grades of C or higher. For international applicants, an appropriate test of English language proficiency is required. Scores from The Test of English as a Foreign Language (TOEFL) are accepted and a minimum iBT score of 84, or pBT score of 550 is required. Scores from The International English Language Testing Service (IELTS) are also accepted and a minimum score of 6.5 is required. A foreign credential evaluation (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fgraduate%2Fadmission%2Fforeign-credentialing%2Findex.html&data=05%7C02%7CKandace.Williams%40utoledo.edu%7C81fcd8b49d0f4bce063508de90152d2d%7C1d6b1707baa94a3da8f8deabfb3d467b%7C0%7C0%7C639106617776742213%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIwLjAuMDAwMCIsIlAiOiJXaW4zMiIsIkFOIjoiTWFpbCIsIlVJIjoyfQ%3D%3D%7C0%7C%7C%7C&sdata=xEOx05On7DPht78ulUbaGJl7LKNg361nMGaFTvejVf0%3D&reserved=0) is required for all applicants who have completed coursework or degrees at non-US institutions. A prior Masters degree is not required to enter the PhD program. At this time, all students accepted without provisions into the PhD in Biomedical Science Program, and maintaining good academic standing, will receive a full tuition scholarship, a research stipend and health insurance. There are also a limited number of tuition scholarships and stipends available for students in the Masters in Biomedical Sciences programs.

Code	Title	Hours
BMSP 6000	Entering Research	1
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	1
BMSP 6470	System Pathophysiology	4
BMSP 6350	Cell Biology & Signaling	3
BMSP 5320	Statistical Methods I	3
INDI 6020	On Being a Scientist	1
MOME 6300	Seminars in Molecular Medicine	1
MOME 6600	Journal Paper Review in Molecular Medicine	1
MOME 6730	Research in Molecular Medicine	1-9
MOME 8500	Advanced Topics in Molecular Medicine	3
MOME 8300	Seminar in Molecular Medicine	1
MOME 8890	Independent Study in Molecular Medicine	4
MOME 9990	Dissertation Research in Molecular Medicine	31
BMSP 8250	Grant Writing Workshop	3
ELectives		18
Total Hours		**82-90**

The minimum number of credits required for PhD is 90, with a minimum of 20 credits of didactic coursework (letter grade), and a minimum of 30 credits of dissertation research. The rest of the credits are approved electives and research in the Molecular Medicine track.

Code	Title	Hours
FIRST TERM		9
Introduction to Biomedical Research [1]		0
Current Problems and Research Approaches (CPRA) in:		
BMSP 6000	Entering Research	1
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research (two five week rotations)	1

Code	Title	Hours
SECOND TERM		9
BMSP 6350	Cell Biology & Signaling	3
BMSP 6470	System Pathophysiology	4
BMSP 6390	Mentored Research (one 5 week lab rotation)	1
MOME 6600	Journal Paper Review in Molecular Medicine	1

Code	Title	Hours
THIRD TERM		6 credits
BMSP 5320	Statistical Methods I (Required BMS core course)	3
INDI 6020	On Being a Scientist	1
MOME 6730	Research in Molecular Medicine	2

[1] Required

Curriculum to include advanced electives in Molecular Medicine or other areas to make up the required number of didactic credit hours. Students will also be expected to present a poster or oral presentation in the annual COMLS Graduate Research Forum in the spring of each year and the Pharmacology Research Colloquium. The Pharmacology Research Colloquium is held on a rotating basis at UTHSC, Michigan State University, the University of Michigan and Wayne State University. It is an annual event in which the students of "pharmacology" departments at the respective Medical Schools have participated in since 1973. These events provide students with excellent opportunities for developing skills in organizing, presenting and discussing their work.

PhD Program Students: Year 2

Code	Title	Hours
FOURTH TERM		9
MOME 8500	Advanced Topics in Molecular Medicine	3
MOME 6300	Seminars in Molecular Medicine	1
MOME 6600	Journal Paper Review in Molecular Medicine	1
MOME 6730	Research in Molecular Medicine	4
or MOME 8890	Independent Study in Molecular Medicine	

The PhD Qualifying Exam is taken no later than February 28th. Prior to passing the PhD Qualifying Exam, the student carries out their research under the course Research in Molecular Medicine (MOME 6730, 1-9 credit hours) or in some cases Independent Study in Molecular Medicine (MOME 6890). After passing the PhD Qualifying Exam, the student carries out their research under the course Dissertation Research (MOME 9990).

Code	Title	Hours
FIFTH TERM		9
MOME 6300	Seminars in Molecular Medicine	1
MOME 6600	Journal Paper Review in Molecular Medicine	1

BMSP 8250	Grant Writing Workshop	3
MOME 9990	Dissertation Research in Molecular Medicine (and/or Electives)	4

Code	Title	Hours
SIXTH TERM		6
MOME 9990	Dissertation Research in Molecular Medicine (or Electives)	6

PHD PROGRAM STUDENTS: YEAR 3

Code	Title	Hours
SEVENTH TERM		9
MOME 6300	Seminars in Molecular Medicine	1
MOME 6600	Journal Paper Review in Molecular Medicine	1
MOME 9990	Dissertation Research in Molecular Medicine	7

Code	Title	Hours
EIGHTH TERM		9
MOME 6300	Seminars in Molecular Medicine	1
MOME 6600	Journal Paper Review in Molecular Medicine	1
MOME 9990	Dissertation Research in Molecular Medicine	7

Code	Title	Hours
NINTH TERM		6
MOME 9990	Dissertation Research in Molecular Medicine	6

PHD PROGRAM STUDENTS: YEAR 4

Code	Title	Hours
Fall, Spring and Summer		
MOME 6300	Seminars in Molecular Medicine	1
MOME 9990	Dissertation Research in Molecular Medicine [1]	5 or 8
8 (fall and spring); 5 (summer) [1]		

Total: 9 (fall and spring); 6 (summer)

PHD Program students: Year 5 and beyond

Code	Title	Hours
MOME 9990	Dissertation Research in Molecular Medicine [1]	1
1 credit until graduation [1]		

- PLO 1. FY1. Identify and summarize the structure and function of cells, tissues, and organs.
- PLO 2. FY2. Describe the molecular, biochemical, and cellular mechanisms that maintain the normal function, development, and plasticity of cells, tissues, and organs.
- PLO 3. FY3. Summarize basic disease causes and processes that affect the structure and function of cells, tissues, and organs.
- PLO 4. FY4. Assess and critically analyze relevant basic science and clinical literature.
- PLO 5. FY5. Design and conduct applicable biomedical sciences experiments.
- PLO 6. FY6. Organize, interpret and summarize results of applicable biomedical sciences experiments.
- PLO 7. FY7. Demonstrate ethical and responsible conduct in research and all other scholarly activities consistent with the University of Toledo, Health Science Campus, Standards of Conduct
- PLO 8. K1 Describe the normal structure and function of the body and its major organ systems, with emphasis on the systems studied in MOME laboratories (e.g., cardiovascular, renal, digestive, endocrine and neuroendocrine systems)
- PLO 9. K2 Describe biochemical, molecular and cellular mechanisms that are important in maintaining cardiac and vascular function as well as metabolism and energy balance.
- PLO 10. K3 Explain the pathophysiology of prevalent cardiovascular and metabolic diseases, such as diabetes, obesity, fatty liver disease, hypertension, heart failure, and ischemic heart disease.
- PLO 11. K4 Describe the genetic and environmental basis of prevalent cardiovascular and metabolic diseases, such as hypertension, diabetes and obesity.
- PLO 12. K5 Describe the epidemiology of prevalent cardiovascular and metabolic diseases, such as hypertension, diabetes and obesity.
- PLO 13. K6 Describe the basic principles of pharmacology (drug action)and pharmacology of specific drugs used in the treatment of prevalent cardiovascular and metabolic diseases.
- PLO 14. K7 Apply statistical methods in the design and interpretation of research projects.
- PLO 15.K8 Apply the principles that govern ethical decision making in the design and conduct of research projects, including the publication and reporting of results.
- PLO 16. K9 Describe the various approaches used to develop research proposals and to raise funds to finance biomedical research projects.
- PLO 17. S1 Demonstrate the ability to perform most basic laboratory procedures that are commonly used in the track laboratories.
- PLO 18. S2 Demonstrate the ability to perform advanced/specialized procedures that are necessary for the completion of the student's thesis research project(s)
- PLO 19. S3 Demonstrate the ability to design and complete independent research projects, including the introduction and optimization of unfamiliar techniques and the development of new research techniques
- PLO 20. S4 Demonstrate the ability to perform productively as a member of a research team and train junior students in routine and basic laboratory techniques
- PLO 21. S5 Demonstrate the ability to recognize hazardous procedures in the laboratory and follow appropriate precautions to protect the laboratory and institutional personnel
- PLO 22. S6 Demonstrate the ability to communicate effectively, both verbally and in writing, with other students, post-doctoral fellows and faculty members, as well as with national and international collaborators
- PLO 23. S7 Demonstrate the ability to present their results at local, national and international meetings as well as to be able to organize and chair local meetings
- PLO 24. S8 Demonstrate the ability to retrieve biomedical information from electronic databases and other sources; to manage, and utilize the information, including by use of bioinformatics, in order to develop hypotheses to address scientific issues and the means to

test them and to discuss the results in the context of reports in the literature.

- PLO 25. S9 Demonstrate the ability to write and submit manuscripts and to communicate effectively with scientific journal editors and reviewers
- PLO 26. S10 Demonstrate the ability to write a comprehensible research proposal and raise funds to support it from federal, state and other funding agencies
- PLO 27. P1 Students will demonstrate ethical, responsible, reliable, and dependable behavior in all aspects of their professional lives, and a commitment to the profession and society.
- PLO 28. P2 Students will demonstrate honesty and integrity in all interactions with faculty advisors, colleagues, faculty members, laboratory and institutional staff, research subjects, and others with whom students may interact in their professional lives.
- PLO 29. P3 Students will demonstrate honesty and integrity in research conduct and reporting of results.
- PLO 30. P4 Students will demonstrate responsible behavior while using shared equipment and facilities.
- PLO 31. P5 Students will demonstrate responsible behavior and willingness to train and teach junior students to the best of their knowledge.
- PLO 32. P6 Students will demonstrate professionalism in dress and grooming incompliance with health and safety rules applicable to the research laboratories and other research sites.
- PLO 33. P7 Students will demonstrate compassionate treatment of patients as subjects of research, and respect for their privacy and dignity.
- PLO 34. P8 Students will demonstrate compassionate treatment of experimental animals, and respect for all laws and regulations applicable to the use of animals in medical research.
- PLO 35. P9 Students will demonstrate professionalism in following rules and regulations set by different committees of the institution, e.g. IACUC, IRB, Biohazard committee, Radiation Safety etc.

Ph.D in Biomedical Science - Medical Microbiology & Immunology

Code	Title	Hours
BMSP 6000	Entering Research	1
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	2
BMSP 6470	System Pathophysiology	4
BMSP 6350	Cell Biology & Signaling	3
BMSP 7320	Statistical Methods I	3
MMIM 6030	Current Topics in MMI	1
INDI 6020	On Being a Scientist	1
MMIM 6890	Research in MMI	9
MMIM 8020	Advanced Immunology	1
MMIM 8030	Current Topics in MMI	4
MMIM 8040	Advanced Microbiology	1
MMIM 9990	Dissertation Research in MMI	54
Total Hours		**90**

First Term		Hours
Introduction to Biomedical Research 1		
Current Problems and Research Approaches (CPRA) in:		
BMSP 6000	Entering Research	1
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	1
	Hours	**8**
Second Term		
BMSP 6350	Cell Biology & Signaling	3
BMSP 6470	System Pathophysiology	4
BMSP 6390	Mentored Research	1
MMIM 6030	Current Topics in MMI	1
All students must pass MMIM '100 Question Exam' by June 30th of their 1st year.		
	Hours	**9**
Third Term		
BMSP 7320	Statistical Methods I	3
INDI 6020	On Being a Scientist	1
MMIM 6890	Research in MMI	2
	Hours	**6**
Fourth Term		
MMIM 8020	Advanced Immunology	1
MMIM 8030	Current Topics in MMI	1
MMIM 6890	Research in MMI	7
All students must pass Qualifying Exam by end of fall semester (December) of their 2nd year		
	Hours	**9**
Fifth Term		
MMIM 8040	Advanced Microbiology	1
MMIM 8030	Current Topics in MMI	1
MMIM 9990	Dissertation Research in MMI	7
	Hours	**9**
Sixth Term		
MMIM 9990	Dissertation Research in MMI	6
	Hours	**6**
Seventh Term		
MMIM 8030	Current Topics in MMI	1
MMIM 9990	Dissertation Research in MMI	8
	Hours	**9**
Eighth Term		
MMIM 9990	Dissertation Research in MMI	8
MMIM 8030	Current Topics in MMI	1
	Hours	**9**

Ninth Term		
MMIM 9990	Dissertation Research in MMI	6
Third Year and Above: (Student Seminar/Current Topics in MMI required in fall and spring semesters)		
	Hours	**6**
Tenth Term		
MMIM 9990	Dissertation Research in MMI	8
	Hours	**8**
Eleventh Term		
MMIM 9990	Dissertation Research in MMI	8
	Hours	**8**
Twelfth Term		
MMIM 9990	Dissertation Research in MMI	1
	Hours	**1**
	Total Hours	**88**

PhD Program Students: Year 5 and above

Code	Title	Hours
Fall, Spring and Summer		
MMIM 8030	Current Topics in MMI (Fall and Spring only)	1
MMIM 9990	Dissertation Research in MMI (Summer only)	1

All PhD students must pass their Qualifying Exam by the end of February of the 2nd year. Before passing the Qualifying Exam, Ph.D. students should conduct research by registering for 'Research in MMI' (Satisfactory/Unsatisfactory; MMIM6890). After passing the Qualifying Exam, Ph.D. students should conduct their research by registering for Dissertation Research in MMI (MMIM9990).

The minimum number of credits required to obtain a Ph.D. is 90, with a minimum of 25 credits of didactic coursework (letter grade), and a minimum of 30 credits of dissertation research. The remainder of the credits are approved electives and research in the Medical Microbiology and Immunology track.

All Ph.D. students are required to register for Current Topics in MMIM (MMIM8030) during all fall and spring semesters while they are enrolled as a student. When a student's graduate advisory committee approves that he/she may begin writing their dissertation, that student then may be exempt from registering for Current Topics in MMIM.

- PLO 1. FY1. Identify and summarize the structure and function of cells, tissues, and organs.
- PLO 2. FY2. Describe the molecular, biochemical, and cellular mechanisms that maintain the normal function, development, and plasticity of cells, tissues, and organs.
- PLO 3. FY3. Summarize basic disease causes and processes that affect the structure and function of cells, tissues, and organs.
- PLO 4. FY4. Assess and critically analyze relevant basic science and clinical literature.
- PLO 5. FY5. Design and conduct applicable biomedical sciences experiments.
- PLO 6. FY6. Organize, interpret and summarize results of applicable biomedical sciences experiments.
- PLO 7. FY7. Demonstrate ethical and responsible conduct in research and all other scholarly activities consistent with the University of Toledo, Health Science Campus, Standards of Conduct.
- PLO 8. K1 Compare and contrast the microorganisms (bacteria, viruses, fungi, parasites, and other agents) that cause disease in humans and animals, including understanding the molecules (virulence factors) and mechanisms by which pathogens cause disease.
- PLO 9. K2 Explain the molecular, biochemical, and cellular mechanisms that are important in maintaining the body's innate and adaptive immune systems, including providing detailed descriptions of the complex interactions of these immune cells and their effectors.
- PLO 10. K3 Explain the pathogenic mechanisms of graft rejection and graft-versus-host disease and recognize areas for potential therapeutic intervention.
- PLO 11. K4 Understand and be able to explain the pathophysiology of prominent infectious and immune-based diseases.
- PLO 12. K5 Correctly use basic bioinformatic and/or statistical methods for the design and interpretation of research data, including understanding when these methods are incorrectly used.
- PLO 13. K6 Integrate the principles and legal responsibilities that govern responsible conduct of research, the ethical care and use of animal models in research, and the accurate reporting of the results.
- PLO 14. S1 Perform laboratory procedures necessary for the completion of the student's dissertation (Ph.D.) or thesis (M.S.) research project(s).
- PLO 15. S2 Design and complete an independent research project.
- PLO 16. S3 Perform research productively as an individual or member of a research team.
- PLO 17. S4 Compile, compose, explain, compare/contrast, and discuss research findings effectively, both orally and in writing.
- PLO 18. S5 Collect (from electronic databases and other sources), prioritize, organize, integrate, and utilize biomedical information for solving problems that are relevant to the appropriate completion of a research project, and accurate reporting of the results.
- PLO 19. P1 Demonstrate the ethical, responsible and reliable behavior in all aspects of their professional lives.
- PLO 20. P2 Demonstrate honesty and integrity in all interactions with colleagues, research subjects, and others with whom students may interact in their professional lives.
- PLO 21. P3 Demonstrate professionalism in dress and grooming in compliance with health and safety rules applicable to the research laboratories and to other institutional and public sites.
- PLO 22. P4 Demonstrate respect for all laws and regulations governing the biomedical research use of animals and patient materials, and for all patient privacy issues.

MSBS Assistant in Pathology

Student Learning Objectives

At the end of the program, students will be able to:

- Perform a complete autopsy including gross examination as well as sampling of various organs for microscopic examination and clinicopathologic correlation surgical pathology.

- Perform gross assessment of surgical pathology specimens including frozen and permanent sections.
- Scholarly project: Develop a research question, use appropriate research strategies and techniques to generate a scholarly response to the question and the findings. The project will be presented at the Department Annual Science Day.
- Produce gross and microscopic photographs demonstrating proficiency in clinical and microscopic photography.
- Demonstrate proficiency in medical terminology.
- Demonstrate mastery of clinicopathologic correlations with laboratory medicine.
- Utilize knowledge of lab management concepts and procedures.
- Demonstrate proficiency and knowledge in embryology, pathophysiology, gross and microscopic anatomy, and general/systemic pathology.

1. Bachelor of science or health science from regionally accredited college or university with minimum cumulative and science 3.0 GPA (Exceptions can be made if the applicant has a terminal Ph.D., M.D., or M.B.B.C.H degree)
2. Complete on-line application form: https://www.utoledo.edu/graduate/apply/
3. Official transcripts. A foreign credential evaluation (https://www.utoledo.edu/graduate/admission/foreign-credentialing/) is required for all applicants who have completed coursework or degrees at non-US institutions.
4. $45 application fee for domestic students, $75 fee for international students
5. 3 letters of recommendation
6. Applicants whose native language is not English and who received their undergraduate degrees from non-English speaking institutions must demonstrate a minimum level of English proficiency to be considered for admission into a UToledo graduate program. Please review Proof of English Language Proficiency for Graduate Students (https://www.utoledo.edu/graduate/international/english-language-proficiency.html) for more information.
7. One shadowing experience in autopsy and surgical pathology
8. Prerequisites Courses with minimum GPA of 3.0 on 4.0 scale:

Prerequisites Courses:

The applicant should have successfully completed the following courses:

- general chemistry with lab
- organic chemistry or biochemistry with lab
- biology with lab
- microbiology with lab
- college-level mathematics
- college-level English composition

Code	Title	Hours
ANAT 5000	Anatomy	5
PHSL 5050	Human Physiology	4
PATH 6060	Surgical Clinical Rotation	6
PATH 6080	Postmortem Clinical Rotation	6
PATH 7130	Pathology	8
PATH 6890	Independent Study in Pathology	4
PATH 6780	Histology and Cell Physiology I	2
INDI 6980	Scholarly Project for Medical Sciences	6
PATH 6070	Intro Clinical Lab Medicine	2
PATH 6790	Histology and Cell Physiology II	2
INDI 8790	Basic and Adv Light Microscopy	4
PATH 6770	Embryology and Teratology	1
PATH 6040	Pathology Assistants: Medical Ethics	1
PATH 7125	Laboratory Management	4
Total Hours		**55**

First Term		**Hours**
ANAT 5000	Anatomy	5
PHSL 5050	Human Physiology	4
PATH 6060	Surgical Clinical Rotation (- Didactic)	2
PATH 6080	Postmortem Clinical Rotation ((Hospital + Forensics) - Didactic)	2
INDI 8790	Basic and Adv Light Microscopy	4
	Hours	**17**
Second Term		
PATH 6060	Surgical Clinical Rotation (- Clinical)	2
PATH 6080	Postmortem Clinical Rotation ((Hospital + Forensics) - Clinical)	2
PATH 7125	Laboratory Management	4
PATH 6770	Embryology and Teratology	1
	Hours	**9**
Third Term		
PATH 6890	Independent Study in Pathology ((LIS, Lab management))	4
PATH 6060	Surgical Clinical Rotation (- Clinical)	2
PATH 6080	Postmortem Clinical Rotation ((Hospital + Forensics) - Clinical)	2
	Hours	**8**
Fourth Term		
PATH 6780	Histology and Cell Physiology I	2
PATH 7130	Pathology	4
INDI 6980	Scholarly Project for Medical Sciences	3
PATH 6070	Intro Clinical Lab Medicine	2
	Hours	**11**
Fifth Term		
PATH 6790	Histology and Cell Physiology II [1]	2
PATH 7130	Pathology	4
INDI 6980	Scholarly Project for Medical Sciences	3
PATH 6040	Pathology Assistants: Medical Ethics	1
	Hours	**10**
	Total Hours	**55**

[1] This course is an independent study in microanatomy to reemphasize what the students learned in the fall semester to allow them to recognize on their own the microscopic feature of various tissues.

- PLO 1. Autopsy Service-perform a complete autopsy including evisceration, dissection and examination of the various organs including brain, describe grossly all organs from a given autopsy
- PLO 2. Surgical Pathology-perform gross examinations on surgical specimens, cut and stain frozen sections, compile related medical history to the surgical specimens, evaluate image findings to the surgical specimens
- PLO 3. Clinical Pathology- interpret peripheral blood smears, provide clinicopathologic correlations for chemistry, microbiology, immunology tests
- PLO 4. Electives and Scholarly Activities- analyze scientific articles, prepare and present scientific papers at annual scientific day

MSBS in Cancer Biology

OVERVIEW

The Cell and Cancer Biology (CCB) track within the Biomedical Science Program at the University of Toledo trains young scientists to become independent investigators who understand the molecular and genetic basis of cancer and have the knowledge of cell biology to develop improved therapies for human cancer. Students in CCB track develop critical and logical thinking and laboratory skills to approach cancer research questions in ways that will best lead to success. CCB program graduates become successful scientists and leaders in academic, government, and industrial settings. CCB students may pursue the Doctor of Philosophy (PhD) degree or, after acceptance into the medical school, a combined MD/PhD degree. A Master's degree in Cancer Biology is also currently offered.

The CCB program faculty research interests and areas of expertise are 1) Aging and cancer, 2) Autophagy and cancer metabolism, 3) Cancer cell motility and chemotaxis, 4) Cancer dormancy, progression, and metastasis, 5) Chromatin remodeling and epigenetic regulation, 6) DNA damage and repair, 7) Drug discovery and delivery, 8) Therapy/drug resistance, 9) Tumor microenvironments, 10) Molecular genetics of cancer risk, 11) Signal transduction.

Admissions requirements:

- An earned degree: Baccalaureate (e.g., B.S., B.A.) granted by an accredited college or university. A foreign credential evaluation (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fgraduate%2Fadmission%2Fforeign-credentialing%2Findex.html&data=05%7C02%7CKandace.Williams%40utoledo.edu%7C81fcd8b49d0f4bce063508de90152d2d%7C1d6b1707baa94a3da8f8deabfb3d467b%7C0%7C0%7C639106617776742213%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIwLjAuMDAwMC%3D%3D%7C0%7C%7C%7C&sdata=xEOx05On7DPht78ulUbaGJl7LKNg361nMGaFTvejVf0%3D&reserved=0) is required for all applicants who have completed coursework or degrees at non-US institutions.
- GPA: A 3.0 GPA (on a 4.0 scale) or higher from the institution granting the baccalaureate or graduate degree.
- Coursework: Prior coursework should include upper division courses in biology, biochemistry and chemistry with grades of C or higher.
- Letters of recommendation: Three or more letters of recommendation are required. Recommendation letters must be signed by the letter writer and full contact information for the letter writer must be provided. The letter should highlight the professional relationship between the applicant and the letter writer, the applicant's work ethic, previous research experience and/or academic preparations, and the intellectual contributions to the research project, if applicable.
- Statement of purpose: Applicants are required to provide a Statement of Purpose, which highlights academic and research training prior to application, CCB faculty and projects that are of particular interest, and future career goals.
- Resume/CV: Applicants are required to submit a resume/curriculum vitae
- Proof of English Language Proficiency for Graduate Students (https://www.utoledo.edu/graduate/international/english-language-proficiency.html) is required for all applicants who have completed coursework or degrees at non-US institutions.

Code	Title	Hours
BMSP 6330		2
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	2
BMSP 6470	System Pathophysiology	4
BMSP 6350	Cell Biology & Signaling	3
CABP 6730	Research in Cancer Biology	4
BMSP 5320	Statistical Methods I	3
INDI 6020	On Being a Scientist	1
CABP 6270	Advanced Cancer Biology	3
CABP 6560	Readings in Cancer Biology (take twice)	2
CABP 6990	Thesis Research in Cancer Biol	12
Total Hours		**42**

Qualifying Examination must be completed by the end of summer semester, which consists of 20 questions taken from a '100 question cancer biology bank' that was given to you at the start of your first semester.

First Term		Hours
Introduction to Biomedical Research		0
BMSP 6330		2
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	1
	Hours	**9**

Second Term		
BMSP 6470	System Pathophysiology	4
BMSP 6350	Cell Biology & Signaling	3
BMSP 6390	Mentored Research	1
CABP 6560 or CABP 8560	Readings in Cancer Biology or Readings in Cancer Biology	1
	Hours	**9**
Third Term		
BMSP 5320	Statistical Methods I	3
INDI 6020	On Being a Scientist	1
CABP 6730	Research in Cancer Biology	2
Qualifying Examination must be completed by end of summer semester, which consists of 20 questions taken from a '100 question cancer biology bank' that was given to you at the start of your first semester.		
	Hours	**6**
Fourth Term		
CABP 6560 or CABP 8560	Readings in Cancer Biology or Readings in Cancer Biology	1
CABP 6270	Advanced Cancer Biology	3
(elective, can also take this course in third year)		
CABP 6990	Thesis Research in Cancer Biol	2
or		
Electives		
	Hours	**6**
Fifth Term		
CABP 6990	Thesis Research in Cancer Biol	10
Electives		
	Hours	**10**
Sixth Term		
CABP 6990	Thesis Research in Cancer Biol (if required)	1
	Hours	**1**
Seventh Term		
CABP 6990	Thesis Research in Cancer Biol (if required)	1
	Hours	**1**
	Total Hours	**42**

Prior to successfully completing the Qualifying Exam by end of 1st summer, students should conduct their thesis research under the course Research inCABP 6730. After passing the Qualifying Exam, students should conduct their research under the course Research in CABP 6990.

The minimum number of credits required for MSBS is 42 total, with a minimum of 20 didactic coursework (letter grade) and a minimum of 10 credits of thesis research. The rest of the credits are approved electives and research in the Cancer Biology track.

- PLO 1. FY1. Identify and summarize the general structure and function of cells, tissues, and organs
- PLO 2. FY2. Describe the common molecular, biochemical, and cellular mechanisms that maintain the normal function, development, and plasticity of cells, tissues, and organs
- PLO 3. FY3. Comprehend and critically evaluate relevant basic science and clinical literature with some guidance and help.
- PLO 4. FY4. Design and conduct applicable biomedical sciences experiments with guidance and help
- PLO 5. FY5. Organize, interpret, and summarize results of applicable biomedical sciences experiments with guidance and help
- PLO 6. FY6. Demonstrate ethical and responsible conduct in research and all other scholarly activities consistent with the University of Toledo, Health Science Campus, Standards of Conduct
- PLO7. K1 Basic knowledge of molecular, biochemical, and cellular mechanisms important in maintaining the body's homeostasis.
- PLO 8. K2 Basic knowledge of the molecular mechanisms of oncogenic transformation from initiation of cells through tumor metastasis.
- PLO 9. K3 Basic knowledge of the pathophysiology of prominent types of cancer.
- PLO 10. K4 Basic knowledge of basic statistical methods used in the design and interpretation of his/her research projects.
- PLO 11. K5 Basic knowledge of the principles and legal responsibilities that govern responsible conduct of research, the ethical care and use of animals in research, and the accurate reporting of research results.
- PLO 12. S1 The ability to perform laboratory procedures necessary for the completion of the student's thesis (M.S.) research project(s).
- PLO 13. S2 The ability to design and complete a research project with some guidance and help.
- PLO 14. S3 The ability to perform research productively as an individual or member of a research team with some guidance and help.
- PLO 15. S4 The ability to communicate research findings effectively, both orally and in writing with some guidance and help
- PLO 16. S5 The ability to retrieve (from electronic databases and other sources), manage, and utilize biomedical information for solving problems that are relevant to the appropriate completion of a research project, and accurate reporting of the results under some guidance and help
- PLO 17. P1 Ethical, responsible, and reliable behavior in all aspects of their professional lives.
- PLO 18. P2 Honesty and integrity in all interactions with colleagues, research subjects, and others with whom students may interact in their professional lives.
- PLO 19. P3 Professionalism in dress and grooming in compliance with health and safety rules applicable to research laboratories and to other institutional and public sites.
- PLO 20. P4 Respect and adherence to all laws and regulations governing the biomedical research use of animals and patient materials, and for all patient privacy issues.

MSBS in Clinical Research

Code	Title	Hours
Core Curriculum		
PUBH 6000	Quantitative and Qualitative Data Analysis in Public Health	3
PUBH 6010	Public Health Epidemiology	3

HURM 6730	Performance Management	3
MGMT 6150	Leading and Developing Yourself	3
MLS 6100	Interdisciplinary Research Methods	3
INDI 6020	On Being a Scientist	1
SURG 6010	Leadership in Health Care	3
SURG 6020	Medical Research, Simulation, Innovation, and Education	3
Electives - select from following for total of 9 credits		
BIPG 5100	Fund Bioinformatics Proteomics	3
BIPG 5200	Statistical Methods in Bioinformatics	3
EFSB 6590	New Venture Creation	3
EFSB 6690	Strategic Management of Innovation	3
BMSP 6250		2
PUBH 6030	Advanced Epidemiology	3
PUBH 6060	Advanced Biostatistics	3
PUBH 6550	Chronic Disease Epidemiology	3
PUBH 6120	Epidemiology Infectious Diseas	3
PUBH 5410	Hazard Control	3
LAWM 5000	Law And The Legal System	2-3
LAWI 6710	Patent Law	2-3
LAWI 6720	Intellectual Property Survey	2-3
Additional electives may be approved on an individual basis, according to student career goals, at the graduate level within BIPG, EFSB, INDI, PUBH, LAWI, or other areas		

First Year

First Term		**Hours**
SURG 6010	Leadership in Health Care	3
SURG 6020	Medical Research, Simulation, Innovation, and Education	3
	Hours	**6**
Second Term		
PUBH 6000	Quantitative and Qualitative Data Analysis in Public Health	3
PUBH 6010	Public Health Epidemiology	3
BIPG 5100	Fund Bioinformatics Proteomics	3
BIPG 5200	Statistical Methods in Bioinformatics	3
	Hours	**12**
Third Term		
HURM 6730	Performance Management	3
MGMT 6150	Leading and Developing Yourself	3
MLS 6100	Interdisciplinary Research Methods	3
PUBH 6030	Advanced Epidemiology	3
INDI 6020	On Being a Scientist	1
	Hours	**13**
	Total Hours	**31**

- PLO 1) Master the essence of statistics in behavioral science needed to help analyze and describe data.
- PLO 2) Describe how to study populations using epidemiological methods and compare populations.
- PLO 3) Demonstrate health care in general and type of leaderships in health care.
- PLO 4) Understand how to manage working groups and laws governing employment.
- PLO 5) Design a research project in health care, formulate a research theory, execute a study and follow the steps from conception to publication.
- PLO 6) Implement use of information technology in health care.
- PLO 7) Describe leadership in general and in health care in particular.
- PLO 8) Demonstrate concepts of leading people influencing and motivating workers to work and achieve goals.
- PLO 9) Introduce methods of grant writing and methods of trying to obtain grants in health care.
- PLO 10) Be effective in leading teams in research and designing research to help improve quality in health care.

MSBS in Molecular Medicine

Code	Title	Hours
BMSP 6330		2
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	1
MOME 6300	Seminars in Molecular Medicine	1
MOME 6600	Journal Paper Review in Molecular Medicine	1
BMSP 6470	System Pathophysiology	4
BMSP 6350	Cell Biology & Signaling	3
MOME 6730	Research in Molecular Medicine	1-9
BMSP 5320	Statistical Methods I	3
INDI 6020	On Being a Scientist	1
MOME 6990	Thesis Research in Molecular Medicine	1-9

The minimum number of credits required for MSBS is 40, with a minimum of 18 credits of didactic coursework (letter grade).

The MSBS curriculum includes advanced electives in Molecular Medicine or other areas to make up the 18 required didactic credit hours.

A minimum of 10 credits of Thesis Research is required for graduation.

Code	Title	Hours
FIRST TERM		9
Introduction to Biomedical Research [1]		0
Current Problems and Research Approaches (CPRA) in:		
BMSP 6330		2
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research (two 5 week lab rotations)	1

Code	Title	Hours
SECOND TERM		9
MOME 6600	Journal Paper Review in Molecular Medicine	1
BMSP 6470	System Pathophysiology	4
or		
BMSP 6350	Cell Biology & Signaling	3
MOME 6730	Research in Molecular Medicine	1-8
or		
BMSP 6390	Mentored Research ((if needed))	1
Electives		0-7

Code	Title	Hours
THIRD TERM		6
BMSP 5320	Statistical Methods I	3
INDI 6020	On Being a Scientist	1
MOME 6730	Research in Molecular Medicine	2

The MSBS First year Qualifying Examination (successful completion required in third term) is taken at the end of the first year

Code	Title	Hours
FOURTH TERM		9
MOME 6300	Seminars in Molecular Medicine	1
MOME 6600	Journal Paper Review in Molecular Medicine	1
MOME 6990	Thesis Research in Molecular Medicine (and/or Electives)	1-7

Code	Title	Hours
FIFTH TERM		9
BMSP 6470	System Pathophysiology	4
or		
BMSP 6350	Cell Biology & Signaling	3
MOME 6300	Seminars in Molecular Medicine	1
MOME 6600	Journal Paper Review in Molecular Medicine	1
MOME 6990	Thesis Research in Molecular Medicine (and/or Electives)	3-4

Code	Title	Hours
SIXTH TERM		6
MOME 6990	Thesis Research in Molecular Medicine	0-6
and/or		
Electives		0-6

Code	Title	Hours
SEVENTH TERM (if necessary)		9
MOME 6990	Thesis Research in Molecular Medicine [2]	1-9
and/or		
Electives		0-8

Code	Title	Hours
EIGHTH TERM (if necessary)		9
MOME 6990	Thesis Research in Molecular Medicine [2]	1-9
and/or		
Electives		0-8

Code	Title	Hours
NINTH TERM (if necessary)		6
MOME 6990	Thesis Research in Molecular Medicine [2]	1-6
and/or		
Electives		0-5

[1] Required.

[2] Seventh, Eighth, and Ninth Terms if necessary. Fall/Spring Semester (9 credits each), Summer (6 credits)

- PLO 1. FY1. Identify and summarize the structure and function of cells, tissues, and organs
- PLO 2. FY2. Describe the molecular, biochemical, and cellular mechanisms that maintain the normal function, development, and plasticity of cells, tissues, and organs
- PLO 3. FY3. Summarize basic disease causes and processes that affect the structure and function of cells, tissues, and organs
- PLO 4. FY4. Assess and critically analyze relevant basic science and clinical literature.
- PLO 5. FY5. Design and conduct applicable biomedical sciences experiments
- PLO 6. FY6. Organize, interpret and summarize results of applicable biomedical sciences experiments.
- PLO 7. FY7. Demonstrate ethical and responsible conduct in research and all other scholarly activities consistent with the University of Toledo, Health Science Campus, Standards of Conduct
- PLO 8. K1 Describe the normal structure and function of the body and its major organ systems, with emphasis on the systems studied in MOME laboratories (e.g., cardiovascular, renal, digestive, endocrine and neuroendocrine systems)
- PLO 9. K2 Describe biochemical, molecular and cellular mechanisms that are important in maintaining cardiac and vascular function as well as metabolism and energy balance.
- PLO 10. K3 Explain the pathophysiology of prevalent cardiovascular and metabolic diseases, such as diabetes, obesity, fatty liver disease, hypertension, heart failure, and ischemic heart disease.
- PLO 11. K4 Describe the genetic and environmental basis of prevalent cardiovascular and metabolic diseases, such as hypertension, diabetes and obesity
- PLO 12. K5 Describe the epidemiology of prevalent cardiovascular and metabolic diseases, such as hypertension, diabetes and obesity
- PLO 13. K6 Describe the basic principles of pharmacology (drug action) and pharmacology of specific drugs used in the treatment of prevalent cardiovascular and metabolic diseases
- PLO 14. K7 Apply statistical methods in the design and interpretation of research projects
- PLO 15. K8 Recognize and explain the principles that govern ethical decision making in the design and apply them in the conduct of research projects, including the publication and reporting of results.

- PLO 16. K9 Describe the various approaches used to develop research proposals and to raise funds to finance biomedical research projects.
- PLO 17. S1 The ability to perform most basic laboratory procedures that are commonly used in the track laboratories.
- PLO 18. S2 The ability to perform advanced/specialized procedures that are necessary for the completion of the student's thesis research project(s)
- PLO 19. S3 The ability to design and complete independent research projects, including the introduction and optimization of unfamiliar techniques and the development of new research techniques
- PLO 20. S4 The ability to perform productively as a member of a research team and train junior students in routine and basic laboratory techniques
- PLO 21. S5 The ability to recognize hazardous procedures in the laboratory and follow appropriate precautions to protect the laboratory and institutional personnel
- PLO 22. S6 The ability to communicate effectively, both verbally and in writing, with other students, post-doctoral fellows, faculty members and other collaborators
- PLO 23. S7 The ability to present their results at local, and national meetings
- PLO 24. S8 The ability to retrieve biomedical information from electronic databases and other sources; to manage, and utilize the information, including by use of bioinformatics, in order to develop hypotheses to address scientific issues and the means to test them and to discuss the results in the context of reports in the literature.
- PLO 25. S9 The ability to write and submit manuscripts and to communicate effectively with scientific journal editors and reviewers
- PLO 26. S10 The ability to write a comprehensible research proposal.
- PLO 27. P1 Students will demonstrate ethical, responsible, reliable, and dependable behavior in all aspects of their professional lives, and a commitment to the profession and society.
- PLO 28. P2 Students will demonstrate honesty and integrity in all interactions with faculty advisors, colleagues, faculty members, laboratory and institutional staff, research subjects, and others with whom students may interact in their professional lives.
- PLO 29. P3 Honesty and integrity in research conduct and reporting of results.
- PLO 30. P4 Students will demonstrate responsible behavior while using shared equipment and facilities.
- PLO 31. P5 Students will demonstrate responsible behavior and willingness to train and teach junior students to the best of their knowledge.
- PLO 32. P6 Students will demonstrate professionalism in dress and grooming incompliance with health and safety rules applicable to the research laboratories and other research sites.
- PLO 33. P7 Students will demonstrate compassionate treatment of patients as subjects of research, and respect for their privacy and dignity.
- PLO 34. P8 Students will demonstrate compassionate treatment of experimental animals, and respect for all laws and regulations applicable to the use of animals in medical research.
- PLO 35. P9 Students will demonstrate professionalism in following rules and regulations set by different committees of the institution, e.g. IACUC, IRB, Biohazard committee, Radiation Safety etc.

MSBS in Medical Microbiology & Immunology

Kevin Pan, MD., Ph.D., Chair, Co- Track Director
Travis Taylor, Ph.D., Co- Track Director

The Medical Microbiology and Immunology (MMIM; formerly Infection, Immunity and Transplantation) track participates in the Master of Science in Biomedical Sciences (MSBS) training program. Students are expected to complete a core curriculum similar to that of doctoral students but with some of the courses as elective offerings, to undergo two rotations before selecting a major advisor and thesis laboratory. The MSBS degree requires 40 credit hours in didactic and other courses, including a minimum of 10 credit hours of thesis research. Students are required to successful pass a qualifying exam and to write and defend a research thesis. Students usually complete the degree requirements in 2-3 years.

Code	Title	Hours
BMSP 6330		2
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	1
BMSP 6470	System Pathophysiology	4
BMSP 6350	Cell Biology & Signaling	3
MMIM 6030	Current Topics in MMI	1
MMIM 6020	Advanced Immunology	1
BMSP 7320	Statistical Methods I	3
INDI 6020	On Being a Scientist	1
MMIM 6990	Thesis Research in MMI	1-9
MMIM 6040	Advanced Microbiology	1
BMSP 6390	Mentored Research	1-15

Code	Title	Hours
FIRST TERM		9 credits
Introduction to Biomedical Research [1]		0
Current Problems and Research Approaches (CPRA) in:		
BMSP 6330		2
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	1

Code	Title	Hours
SECOND TERM		9 credits

BMSP 6350	Cell Biology & Signaling	3
BMSP 6470	System Pathophysiology	4
MMIM 6030	Current Topics in MMI	1
BMSP 6390	Mentored Research	1
All students must pass MMIM '100 Question Exam' by June 30th of their 1st year.		

Code	Title	Hours
THIRD TERM		6 credits
BMSP 7320	Statistical Methods I	3
INDI 6020	On Being a Scientist	1
MMIM 6890	Research in MMI	2
All MSBS students must pass Qualifying Exam by the end of summer semester (August) of their 1st year.		

Code	Title	Hours
FOURTH TERM		9 credits
MMIM 6030	Current Topics in MMI	1
MMIM 6020	Advanced Immunology (optional)	1
MMIM 6990	Thesis Research in MMI	7-8

Code	Title	Hours
FIFTH TERM		9 credits
MMIM 6030	Current Topics in MMI	1
MMIM 6040	Advanced Microbiology (optional)	1
MMIM 6990	Thesis Research in MMI	7-8

Code	Title	Hours
SIXTH TERM		6 credits
MMIM 6990	Thesis Research in MMI	6

Code	Title	Hours
SEVENTH TERM (if necessary)		
MMIM 6990	Thesis Research in MMI	1-9

Code	Title	Hours
EIGHTH TERM (if necessary)		
MMIM 6990	Thesis Research in MMI	1-9

[1] Required.

The minimum number of credits required for MSBS is 40, with a minimum of 21 credits of didactic coursework (letter grade), and a minimum of 10 credits of thesis research. The rest of the credits are approved electives and research in the Medical Microbiology and Immunology track.

- PLO 1. FY1. Identify and summarize the structure and function of cells, tissues, and organs
- PLO 2. FY2. Describe the molecular, biochemical, and cellular mechanisms that maintain the normal function, development, and plasticity of cells, tissues, and organs
- PLO 3. FY3. Summarize basic disease causes and processes that affect the structure and function of cells, tissues, and organs
- PLO 4. FY4. Assess and critically analyze relevant basic science and clinical literature.
- PLO 5. FY5. Design and conduct applicable biomedical sciences experiments
- PLO 6. FY6. Organize, interpret and summarize results of applicable biomedical sciences experiments.
- PLO 7. FY7. Demonstrate ethical and responsible conduct in research and all other scholarly activities consistent with the University of Toledo, Health Science Campus, Standards of Conduct
- PLO 8. K1 Knowledge of the microorganisms (bacteria, viruses, fungi, parasites, and other agents) that cause disease in humans and animals or are related to these agents.
- PLO 9. K2 Knowledge of molecular, biochemical, and cellular mechanisms that are important in maintaining the body's innate and adaptive immune systems.
- PLO 10. K3 Knowledge of pathogenic mechanisms of graft rejection and graft-versus-host disease.
- PLO 11. K4 Knowledge of the pathophysiology of prominent infectious and immune-based diseases.
- PLO 12. K5 Knowledge of basic bioinformatic and statistical methods used in the design and interpretation of research projects.
- PLO 13. K6 Knowledge of the principles and legal responsibilities that govern responsible conduct of research, the ethical care and use of animal models in research, and the accurate reporting of the results.
- PLO 14. S1 The ability to perform laboratory procedures necessary for the completion of the student's dissertation (Ph.D.) or thesis (M.S.) research project(s).
- PLO 15. S2 The ability to design and complete an independent research project.
- PLO 16. S3 The ability to perform research productively as an individual or member of a research team.
- PLO 17. S4 The ability to communicate research findings effectively, both orally and in writing.
- PLO 18. S5 The ability to retrieve (from electronic databases and other sources), manage, and utilize biomedical information for solving problems that are relevant to the appropriate completion of a research project, and accurate reporting of the results.
- PLO 19. P1 Ethical, responsible and reliable behavior in all aspects of their professional lives.
- PLO 20. P2 Honesty and integrity in all interactions with colleagues, research subjects, and others with whom students may interact in their professional lives.
- PLO 21. P3 Professionalism in dress and grooming in compliance with health and safety rules applicable to the research laboratories and to other institutional and public sites.
- PLO 22. P4 Respect for all laws and regulations governing the biomedical research use of animals and patient materials, and for all patient privacy issues.

Biomedical Science: Transplantation and Donation Sciences

Julie DeSantis, Program Director

The master's degree in Transplantation and Donation Sciences (MSBS-TaDS) program is the only academic program in the country designed to provide professional preparation for individuals who wish to become an organ Procurement Transplant Coordinator (PTC). PTCs facilitate the entire organ donation process from beginning to end, serving as liaisons between the donor's family, the coroner/medical examiner, the medical and nursing staff, the organ procurement organization (OPO), and all other involved entities. As a result, coordinators must skillfully and diplomatically deal with a number of issues, agendas and personalities in order to achieve a successful organ transplant.

Combining core science coursework with business and management electives further enables the MSBS-TaDS graduate to step into the professional world of organ and tissue donation and be more prepared to obtain leadership positions within their organ procurement organization (OPO).

Entrance requirements/prerequisites:

- Baccalaureate degree from a school that is accredited by a nationally recognized body for accreditation of postsecondary education.
- Overall grade point average of 3.0 in undergraduate work coursework.
- Submission of online University of Toledo Graduate School Application including resume and personal statement.
- Three letters of recommendation (using the University of Toledo forms is optional).
- A minimum of two semesters of coursework in the biological sciences, a minimum of two semesters of coursework in chemistry, and one semester of college algebra or higher level math, with course grades of B or above.
- Satisfactory completion of a course in medical terminology and/or pass a medical terminology proficiency examination. Candidates who are unable to pass the initial medical terminology proficiency examination will be required to participate in a self-study program and pass a re-test.
- The Graduate Record Examination (GRE) may be required for international students.
- To begin your application, visit the Applying for Graduate Admission (https://www.utoledo.edu/graduate/apply/) page and choose the option that applies to you.
- Proof of English Language Proficiency for Graduate Students (https://www.utoledo.edu/graduate/international/english-language-proficiency.html) and a foreign credential evaluation (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fgraduate%2Fadmission%2Fforeign-credentialing%2Findex.html&data=05%7C02%7CKandace.Williams%40utoledo.edu%7C81fcd8b49d0f4bce063508de90152d2d%7C1d6b1707baa94a3da8f8deabfb3d467b%7C0%7C0%7C639106617776742213%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIwLjAuMDAwMCIsIlAiOiJXaW4zMiIsIkFOIjoiTWFpbCIsIlduIjoyfQ%3D%3D%7C0%7C%7C%7C&sdata=xEOx05On7DPht78ulUbaGJl7LKNg361nMGaFTvejVf0%3D&reserved=0) is required for all applicants who have completed coursework or degrees at non-US institutions.
- Interview with the TADS Program Director, if requested.
- Graduate School application fee.

*Although not required, shadowing an organ procurement coordinator is highly recommended.

Persons who are currently practicing professionals working for an organ procurement organization are eligible to apply for this program and complete the curriculum entirely on-line through the distance learning track. All other applicants who meet the above entrance requirements are eligible for the in person, on-campus track.

First Term		Hours
HDSC 5010	Organ Transplant Procurement	3
HDSC 5210	Scientific & Clinical Foundations for Human Organ & Tissue Donation & Transportation	6
HDSC 5110	Fundamental Concepts and Clinical Practicum I	3
Elective		3
	Hours	**15**
Second Term		
HDSC 5310	Clinical Aspects Procurement	4
HDSC 5120	Clinical Practicum II	2
HDSC 5020	Scholarly Proj Hum Donation Sc	3
Elective		3
Elective		3
	Hours	**15**
Third Term		
HDSC 5130	Human Donation Sci Internship	8
HDSC 5410	Human Donation Science Seminar	2
	Hours	**10**
	Total Hours	**40**

Code	Title	Hours
Elective Coursework		
Select three of the following:		9
Or Equivalent elective approved by Program Director		
PUBH 6000	Quantitative and Qualitative Data Analysis in Public Health (fall/spring)	
HURM 6730	Performance Management (fall/spring)	
MGMT 6150	Leading and Developing Yourself (fall/spring)	
LAWM 5000	Law And The Legal System (fall)	
PUBH 6510	Issues in Pandemic Preparedness and Response	
MGMT 6100	Leading Through Ethical Decision-Making	
MGMT 6190	Leading change and Organizational Improvement	

Total Program Credit Hours (minimum) for MSBS, PSM degree in Transplantation and Donation Sciences is 40 credits.

- Analyze a hospital's organ and tissue donor potential within the Organ Procurement Organization's (OPO) Federal Designated Service Area (DSA) and identify specific needs for policy updates and staff

education to comply with the federal Organ Procurement Transplant Network (OPTN) and Federal Drug Administration (FDA) regulations.

- Evaluate potential organ and tissue donors through medical and social history, current medical condition, and infectious disease testing to determine suitability for transplant.
- Identify the appropriate family member (LNOK) to obtain authorization for organ and tissue donatiom and communicate effectively and compassionately with the family throughout the case with an understanding of theor emotional and cultural needs.
- Identify and assess physiologic issues in the organ and tissue donor related to brain death and current medical condition and implement appropriate interventions to achieve optimal organ function for transplantable organs and tissues.
- Identify and assess physiologic issues in the organ and tissue donor related to brain death and current medical condition and implement appropriate interventions to achieve optimal organ function for transplantable organs and tissues.
- Coordinate and collaborate with organ and tissue recovery teams and surgical staff to ensure optimal recovery and preservation of organs and tissues according to the OPTN and FDA regulations.
- Assemble the written permanent record of each donor case with all required documentation maintaining confidentiality according to the OPTN and the Health Insurance Portability and Accountability Act (HIPAA).
- Communicate effectively with donor families, hospital staff, coroners/medical examiners, funeral homes, and transplant centers to build, maintain, and improve relationships in order to improve donation and transplant outcomes.
- Demonstrate professionalism through code of ethics, life-long learning, self-improvemnet, increased work knowledge, awareness of new practice trends, and scientific advancements as it relates to the donation and transplant field.

Medical Physics Programs

Masters Track

Programs of study leading to the Master of Science in Biomedical Science (MSBS) degree in Medical Physics are offered by the graduate faculty of the Department of Radiation Oncology and the Department of Radiology. In addition to the basic medical science and radiological physics coursework, students may select a specific course of study in radiation oncology physics or in diagnostic imaging. Each course of study includes didactic courses, independent study, and hands-on clinical work covering the selected discipline, along with specific technical research culminating in a research project or thesis. The graduate program is committed to excellence in scientific education, clinical experience, and research, leading to the professional development of highly motivated and dedicated students. In addition to the creative scientific research, the coursework and clinical experience is intended to provide students with the fundamental knowledge and educational requirement for eventually becoming board certified in their area of study by The American Board of Radiology, The American Board of Medical Physics, or other credentialing body.

PHD Track

The PhD in Physics with Concentration in Medical Physics: Please refer to the College of Natural Sciences Catalog (p. 198) for additional information regarding this program, and specifically, the Department of Physics and Astronomy section for admission and degree requirements. Information also may be found at http://www.utoledo.edu/med/depts/radther/.

Research Facilities

The Department of Radiation Oncology has access to a variety of computer systems for radiation oncology treatment planning, programming, and image analysis. A wide range of radiation measuring equipment is available, including a full range of dosimetry and quality control test equipment, Wellhoffer computerized beam scanning system, an array of ionization chambers, software and hardware packages for film dosimetry and analysis, oscilloscopes, and test phantoms. Also available are multichannel analyzer scintillation detectors, autogamma, and liquid scintillation counters, diode, thermoluminescent dosimetry systems, nanodot dosimeters, and digital scanners for chromic film dosimetry systems, RIT densitometry packages, etc.

The Medical Physics program is housed on the Health Science Campus at the University of Toledo Medical Center (UTMC) where much of the medical physics training is accomplished at the Dana Cancer Center. This state-of-the-art building houses the radiation oncology department and has a division of radiology, medical oncology, and surgical oncology. All the specialists are under one roof and the concept of a true cancer center is practiced. Besides being a leader in stereotactic radiosurgery (SRS) and stereotactic Body Radiotherapy (SBRT), the University of Toledo Medical Center provides IMRT treatment planning with IGRT capabilities, conventional 3D conformal external beam radiotherapy, and other stereotactic neurologic radiosurgery capabilities such as AVM with inverse planning arc modulation technology. Other treatment modalities that students are exposed to are: Brachytherapy low and high dose rate, Radionuclide therapy using P-32, I-131, Sr-89, Ra-223, etc. A large Cs-137 irradiator is also available on campus for blood, small animal, or other cellular petri-dish irradiation.

The MSBS degree in Medical Physics typically requires 55 credit hours, with at least 25 credits in didactic course work (graded), and a minimum of 10 credits in Thesis Research (INDI 6999) over a 22 months period.

Department of Radiation Oncology Equipment

- A Varian True Beam Linear Accelerator, capable of producing photon energies of 6MV, 10MV, and 18 MV, and 6X FFF, and a range of electron energies from 6 to 20 MeV in 2-3 MeV increments.
- A Varian Edge Linear Accelerator, capable of producing photon energies of 6MV, 10MV, 6X FFF, and 10X FFF. This is a specialized new Varian product designed for SRS/SBRT cases with 2.5 mm leafs.
- Both accelerators are equipped with latest state of the ART technology including onboard imaging, EPID MV imaging, Rapid ARC (VMAT), and Gating. The Edge unit is also capable of Optical Surface Monitoring System (OSMS) used for patient positioning.
- ARIA patient management system

- A Philips ADAC Pinnacle treatment planning software package for external beam radiotherapy planning,
- Varian Eclipse Treatment Planning system
- MIM software for rigid and deformable image fusion
- A remote afterloading High Dose Rate brachytherapy unit manufactured by Varian for treatment of interstitial, intracavitary and intraluminal tumors and the associated BrachyVision software package for HDR brachytherapy treatment planning
- VariSeed software package used for prostate seed implant program
- A Philips Gemini Large Bore PET/CT unit equipped with Sim package used for radiotherapy treatment simulations
- An array of low dose rate brachytherapy sources of CS-137 for intracavitary treatment
- A fully automated water scanning system manufactured by Welhoffer
- Various film scanning systems such as VIDAR scanners and HOWTEK scanner for normal diagnostics and chromic film dosimetry
- RIT dosimetry software system for dosimetric analysis using films
- BAT ultrasound system
- An array of ionization chambers and electrometers for dosimetry measurements including highly sensitive farmer, and parallel plate chambers, micro chambers, and scintillation chambers.
- Thermoluminesence dosimeter (TLD) system and oven for annealing TLD chips.
- A MicroStar II OSLD system with nanodots for in-vivo dosimetry

Department of Radiology Equipment

- Multiple fixed and mobile radiographic and fluoroscopic systems
- Image intensifier and flat panel solid state detector fluoroscopic systems
- Computed radiography and digital radiography systems
- Mammography and stereotactic mammography systems
- Multi-slice (16 and 64) computed tomography systems
- 1.5 and 3.0 Tesla MRI imaging systems
- 4 SPECT imaging systems
- A PET/CT imaging system
- Multiple ultrasound imaging systems
- Hospital-wide GE Centricity PACS system
- Terarecon Aquarius Image Processing workstations and image servers.
- Multiple Windows and Linux PC's for image processing and analysis
- Full complement of diagnostic medical physics test phantoms and dosimetry equipment.

Admissions offers are given only for fall semester. Applications are considered on first come first serve basis, therefore earlier applications are encouraged.

A Bachelor's degree with a major (preferred) or minor in physics or applied physics from an accredited institution is a prerequisite for admission to the graduate medical physics program. Other physical science or engineering degrees may be considered if the appropriate fundamental physics courses have been completed, equivalent to a minor in physics. Consistent with the requirements of our accrediting body CAMPEP, we define a minor as 3 upper level physics courses. For most programs this will be mean 3 courses at the 3000 or 4000 level.

Completion of a senior-level undergraduate anatomy course is also preferred. Fulfillment of these requirements provides eligibility for the initial certification in Radiological Physics by the ABR.

- Applicants must have minimum GPA of 3.0
- Statement of Purpose
- Three letters of recommendation
- Resume (optional)
- Official confirmation of Degree(s) awarded and transcripts attested. A foreign credential evaluation (https://www.utoledo.edu/graduate/admission/foreign-credentialing/) is required for all applicants who have completed coursework or degrees at non-US institutions.
- GRE Score is not required but recommended
- Applicants whose native language is not English and who received their undergraduate degrees from non-English speaking institutions must demonstrate a minimum level of English proficiency to be considered for admission into a UToledo graduate program. Please review Proof of English Language Proficiency for Graduate Students (https://www.utoledo.edu/graduate/international/english-language-proficiency.html) for more information. International applicants must meet at least one of the following English language proficiency requirements unless they are a citizen of an exempted country (listed here (https://www.utoledo.edu/graduate/admission/english-proficiency/english-test-exempt.html)).
  - TOEFL IBT equal to 80 or above, IELTS equal to 6.5 or above, PTE equal to 58 or above, Duolingo equal to 105 or above.
  - Graduated from a regionally accredited institution in the United States or attended at least one year full time at a regionally accredited US institution earning a 3.0 or higher GPA.

To obtain a MSBS degree from the COMLS, students must complete a minimum of 40 credit hours of approved credit beyond the baccalaureate, with at least 25 credits in didactic course work (requiring a grade) and a minimum of 9 credits in Thesis Research (INDI 6990).

The MSBS degree in Medical Physics typically involves 55 credit hours over a 22 months period.

Medical physics core courses include:

Code	Title	Hours
ANAT 5000	Anatomy (course includes modules in physiology)	4
INDI 6020	On Being a Scientist	1
MPHY 6010	Survey of Diagnostic Medical Imaging I	3
MPHY 6120	Radiation Dosimetry I	3
MPHY 6160	Radiation Biology	3
MPHY 6300	Radiation Detection/Measuremen	3
MPHY 6200	Radiatn Protect and Regulation	3
MPHY 6110	Survey Clinical Radi Therapy	2
MPHY 6500	Medical Physics Seminar	1
INDI 6990	Thesis Research	9
MPHY 6130	Radiation Dosimetry II	3

MPHY 6180	Physics of Radiation Therapy	3
MPHY 6020	Survey of Diagnostic Medical Imaging II	3
MPHY 6260	Computers in Medical Physics	2
MPHY 6320	Practical Measurements in Radiation Therapy	2
PHYS 6180	Advanced Atomic And Nuclear Physics Laboratory	2-3

Typical course curriculum in Medical Physics - Radiation Oncology track include:

Code	Title	Hours
MPHY 6610	Clin Trng Radi Oncol Physics I	4
MPHY 6620	Clin Trng Radi Oncol Physcs II	4

Typical course curriculum in Medical Physics - Diagnostic Imaging track include:

Code	Title	Hours
MPHY 6060	Nuclear Medicine	3
MPHY 6860	Independent Study in Radiology (CT and MRI)	4

Non-thesis option

A non-thesis option is available for students who present advanced degrees from previous graduate work which included a scientific thesis or dissertation.

Combined Bachelor's to Master's Pipeline Program

Undergraduate students accepted to the Physics or MS in Biomedical Science (Medical Physics) Pipeline Program will be admitted to the MS Physics with Non-Thesis Option or MS in Biomedical Science (Medical Physics) and allowed to complete up to nine credits of graduate level classes while completing their final 1-2 years of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine credit hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine credit hours of graduate taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when all undergraduate degree requirements are satisfied.

MSBS in Medical Science

Guillermo Vazquez, Ph.D., Program Director

The **Master of Science in Biomedical Science with focus in Medical Sciences (MSBS-MS)** is a one-year postbaccalaureate graduate program at The University of Toledo College of Medicine and Life Sciences (UTCOMLS) designed to provide students who have completed all prerequisites for medical school with resources to strengthen their academic credentials as they prepare their applications to U.S. medical schools. The MSBS-MS curriculum concentrates on an organ systems based approach in which clinical and graduate faculty train students in the pathophysiology of disease and pharmacological interventions, incorporating material taught to medical students during the first (M1) and second (M2) years of the medical school curriculum. This approach imprints in our students a foundational knowledge of the MD curriculum and, since pathophysiology of disease is a key component of USMLE exams, it prepares students for better performance in the M1/M2 curriculum and on Step 1 and Step 2 exams. The MSBS-MS program also provides a unique opportunity for students to conduct clinical and/or basic science research. UToledo's basic and clinical science faculty mentor students through their year-round Scholarly Project, allowing students to expand their critical scientific logic for the experimental sciences, adding a strong component to their academic credentials

- Applicant must be a U.S. Citizen or U.S Permanent Resident (greencard holder)
- Baccalaureate degree from an accredited college or university
- All premed coursework required for admission to medical school must be completed prior to admission into the MSBS-MS program
  - Official MCAT scores taken within five years from the anticipated matriculation year to medical school. A composite MCAT score of at least 496 is required to be considered for the medical school interview.
  - Official undergraduate transcripts confirming degree submitted directly to the College of Graduate Studies
- GPA of 3.0 or greater is recommended
- One letter of recommendation
  - Committee recommendation letters are accepted with all signatures.
  - Recommendation letters must include applicant's full name.
  - Recommendation letters submitted to medical schools are not accepted.
- Personal statement
  - Personal statements from medical school applications are not accepted. A new personal statement with a career goal is required for MSBS-MS admission.
- MSBS Medical Sciences requires a National Centralized Application (CAS) and is listed on the application page (PostBacCAS application). Complete the CAS application using the link listed with MSBS Medical Sciences. Do not complete The University of Toledo application.
  - Application fee submitted at the time of online application

Code	Title	Hours
ANAT 5000	Anatomy	4
INDI 5450	Molecular Cell Biology	7
PUBH 6001	Biostatistics for Medical Sciences	3
INDI 6980	Scholarly Project for Medical Sciences	8
INDI 5350	Pathophysiology of Organ Systems	10
INDI 5650	Immunology and Medical Microbiology	4
INDI 6020	On Being a Scientist	1
INDI 6920	Student Seminar Series	1
Total Hours		**38**

First Term		Hours
ANAT 5000	Anatomy	4
INDI 5450	Molecular Cell Biology	7
PUBH 6001	Biostatistics for Medical Sciences	3
INDI 6980	Scholarly Project for Medical Sciences	1
	Hours	**15**
Second Term		
INDI 5350	Pathophysiology of Organ Systems	10
INDI 5650	Immunology and Medical Microbiology	4
INDI 6980	Scholarly Project for Medical Sciences	1
	Hours	**15**
Third Term		
INDI 6020	On Being a Scientist	1
INDI 6920	Student Seminar Series	1
INDI 6980	Scholarly Project for Medical Sciences	6
	Hours	**8**
	Total Hours	**38**

Program total minimum of credits for MSBS degree in Medical Science is 38 credits.

- PLO1. MSBS-MS students will assess and integrate concepts from a variety of sources including lecture-based, research-based and practice-generated information.
- PLO 2. MSBS-MS students will be able to explain human physiology and pathophysiology through an organ systems-based approach.
- PLO 3. MSBS-MS students are expected to demonstrate ability to conduct basic laboratory procedures as part of their Scholarly Project, and to perform productively as members of a research team.
- PLO 4. MSBS-MS students are expected to be able to communicate effectively, both orally and in writing - including use of UToledo email - with classmates, peer mentors, faculty, advisor, and staff.
- PLO 5. MSBS-MS students are expected to demonstrate responsible, reliable, and dependable behavior in all activities, within and outside the program, demonstrating honesty and integrity in all their actions and interactions with peers, faculty, advisor, and staff. This includes the ability to demonstrate sensitivity toward issues related to diversity and inclusion as the students progress through the program-related academic activities.

Neurosciences and Neurological Disorders, MSBS

Code	Title	Hours
BMSP 6330		2
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	2
BMSP 6470	System Pathophysiology	4
BMSP 6350	Cell Biology & Signaling	3
BMSP 5320	Statistical Methods I	3
NNDP 6500	Seminar in Neuroscience	1
NNDP 6730		3
NNDP 6990	Thesis Research Neurosci Neuro	10
INDI 6020	On Being a Scientist	1
Electives		5
Total Hours		**40**

First Year

First Term		Hours
BMSP 6330		2
BMSP 6340	Curr Prob Res App Genes/Genom	2
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
BMSP 6380	Methods in Biomedical Sciences	2
BMSP 6390	Mentored Research	1
	Hours	**9**
Second Term		
BMSP 6470	System Pathophysiology	4
BMSP 6350	Cell Biology & Signaling	3
NNDP 6500	Seminar in Neuroscience	1
BMSP 6390	Mentored Research	1
	Hours	**9**
Third Term		
BMSP 5320	Statistical Methods I	3
INDI 6020	On Being a Scientist	1
NNDP 6730		3
	Hours	**7**
Second Year		
First Term		
NNDP 6990	Thesis Research Neurosci Neuro	6-9
and/or electives		0-3
	Hours	**6-12**
Second Term		
NNDP 6990	Thesis Research Neurosci Neuro	6-9
and/or electives		0-3
	Hours	**6-12**
Third Term		
NNDP 6990	Thesis Research Neurosci Neuro	3-6
and/or electives		0-3
	Hours	**3-9**
	Total Hours	**40-58**

- 1. Identify and summarize the structure and function of cells, tissues, and organs.
- 2. Describe the molecular, biochemical, and cellular mechanisms that maintain the normal function, development, and plasticity of cells, tissues, and organs.
- 3. Summarize basic disease causes and processes that affect the structure and function of cells, tissues, and organs.
- 4. Assess and critically analyze relevant basic science and clinical literature.

- 5. Design and conduct applicable biomedical sciences experiments.
- 6. Organize, interpret and summarize results of applicable biomedical sciences experiments.
- 7. Demonstrate ethical and responsible conduct in research and all other scholarly activities consistent with the University of Toledo, Health Science Campus, Standards of Conduct (Policy 01-027).
- 8. K2 Knowledge of molecular, biochemical, and cellular mechanisms which are important in homeostatic maintenance of normal nervous system function.
- 9. K3 Knowledge of the basic neurophysiology of excitable membranes.
- 10. K4 Knowledge of neurophysiological basis of behavior in health and disease.
- 12. . K9 Knowledge of the use of statistical methods in the appropriate design, analysis and interpretation of research projects.
- 13. S3 The ability to design and complete independent research projects, and the ability to perform productively as a member of a research team.
- 14.. S4 The ability to communicate effectively, both orally and in writing, with colleagues, faculty, scientific journal editors/reviewers, and research granting agencies.
- 15. P5 Compassionate treatment of experimental animals, and respect for all laws and regulations applicable to the use of animals in biomedical research.

MSBS in Oral Biology

Michael Nedley, D.D.S., Program Director

The oral biology program is restricted to Pediatric and General Dentistry Residents who are completing their training at the University of Toledo, College of Medicine & Life Sciences and UTMC. The program's curriculum is designed specifically for each Dental Resident and students should consult with their advisor to create their specific Plan of Study.

Oral Biology- General Dentistry Concentration, MS
Oral (p. 176)Biology- Pediatrics Concentration, MS

Oral Biology- General Dentistry Concentration, MS

Code	Title	Hours
DENT 6010	Growth and Development	0.5
DENT 6020	Pharmacology 1	0.5
DENT 6030	Dento-Alveolar Trauma I	0.5
DENT 6040	Conscious Sedation I	2
DENT 6060	Principles of Behav/Comm Mgmt	2
DENT 6080	Anatomy & Embryology Head/Neck	1
DENT 6090	Concepts - Dental Microbiology	0.5
DENT 6110	Oral Health Policies	2
DENT 6120	Pharmacology II	0.5
DENT 6130	Dento-alveolar Trauma II	0.5
DENT 6140	Conscious Sedation II	2
DENT 6160	Special Care Dentistry	1
DENT 6200	Oral Pathology	1
DENT 6210	Endodontics	2
DENT 6220	Operative Dentistry	2
DENT 6230	Dental Occlusion	2
DENT 6240	Dentures	2
DENT 6250	General Dentistry Literature Review	1.5
DENT 6260	Clinical General Dentistry Dental Clinic	4
DENT 6020	Pharmacology 1	0.5
INDI 6020	On Being a Scientist	1
INDI 6980	Scholarly Project for Medical Sciences	14
PUBH 6001	Biostatistics for Medical Sciences	3
Total Hours		**46**

Oral Biology- Pediatrics Concentration, MS

Code	Title	Hours
DENT 6010	Growth and Development	0.5
DENT 6020	Pharmacology 1	0.5
DENT 6030	Dento-Alveolar Trauma I	0.5
DENT 6040	Conscious Sedation I	2
DENT 6050	Clinical Pediatric Dentistry	2.5
DENT 6060	Principles of Behav/Comm Mgmt	2
DENT 6070	Pediatric Dentistry Literature	1.5
DENT 6080	Anatomy & Embryology Head/Neck	1
DENT 6090	Concepts - Dental Microbiology	0.5
DENT 6100	Pediatric Medicine Lecture	6
DENT 6110	Oral Health Policies	4
DENT 6120	Pharmacology II	0.5
DENT 6130	Dento-alveolar Trauma II	0.5
DENT 6140	Conscious Sedation II	4
DENT 6150	Amer Board of Pediaric Dent RE	2
DENT 6160	Special Care Dentistry	1
DENT 6200	Oral Pathology	1
INDI 6020	On Being a Scientist	1
INDI 6980	Scholarly Project for Medical Sciences	14
PUBH 6001	Biostatistics for Medical Sciences	3
Total Hours		**48**

Oral Biology- General Dentistry Concentration, MS (p. 176)
Oral Biology- Pediatrics Concentration, MS (p. 176)

Oral Biology- General Dentistry Concentration, MS

First Term		Hours
DENT 6250	General Dentistry Literature Review	0.5
DENT 6020	Pharmacology 1	0.5
DENT 6260	Clinical General Dentistry Dental Clinic	.5
DENT 6060	Principles of Behav/Comm Mgmt	2
DENT 6040	Conscious Sedation I	2
DENT 6030	Dento-Alveolar Trauma I	0.5
DENT 6140	Conscious Sedation II	2
	Hours	**8**
Second Term		
DENT 6010	Growth and Development	0.5

DENT 6260	Clinical General Dentistry Dental Clinic	.5
DENT 6250	General Dentistry Literature Review	.5
INDI 6980	Scholarly Project for Medical Sciences ( )	.5
PUBH 6001	Biostatistics for Medical Sciences	3
DENT 6210	Endodontics	2
	Hours	**7**
Third Term		
DENT 6250	General Dentistry Literature Review	.5
DENT 6260	Clinical General Dentistry Dental Clinic	1
DENT 6080	Anatomy & Embryology Head/Neck	1
DENT 6090	Concepts - Dental Microbiology	0.5
DENT 6120	Pharmacology II	0.5
DENT 6130	Dento-alveolar Trauma II	0.5
INDI 6980	Scholarly Project for Medical Sciences	2
DENT 6230	Dental Occlusion	2
	Hours	**8**
Fourth Term		
DENT 6240	Dentures	2
DENT 6110	Oral Health Policies	2
INDI 6980	Scholarly Project for Medical Sciences	3
DENT 6200	Oral Pathology	1
	Hours	**8**
Fifth Term		
DENT 6110	Oral Health Policies	2
DENT 6220	Operative Dentistry	2
DENT 6160	Special Care Dentistry	1
INDI 6980	Scholarly Project for Medical Sciences ( )	2
	Hours	**7**
Sixth Term		
DENT 6260	Clinical General Dentistry Dental Clinic	2
INDI 6020	On Being a Scientist	1
INDI 6980	Scholarly Project for Medical Sciences ( )	5
	Hours	**8**
	Total Hours	**46**

Oral Biology- Pediatrics Concentration, MS

First Term		**Hours**
DENT 6040	Conscious Sedation I	2
DENT 6060	Principles of Behav/Comm Mgmt	2
DENT 6070	Pediatric Dentistry Literature	0.5
DENT 6050	Clinical Pediatric Dentistry	0.5
DENT 6020	Pharmacology 1	0.5
DENT 6030	Dento-Alveolar Trauma I	0.5
DENT 6140	Conscious Sedation II	2
	Hours	**8**
Second Term		
DENT 6010	Growth and Development	0.5
DENT 6050	Clinical Pediatric Dentistry	1
DENT 6070	Pediatric Dentistry Literature	0.5
INDI 6980	Scholarly Project for Medical Sciences ( )	3
PUBH 6001	Biostatistics for Medical Sciences	3
	Hours	**8**
Third Term		
DENT 6050	Clinical Pediatric Dentistry	1
DENT 6070	Pediatric Dentistry Literature	0.5
DENT 6080	Anatomy & Embryology Head/Neck	1
DENT 6090	Concepts - Dental Microbiology	0.5
DENT 6120	Pharmacology II	0.5
DENT 6130	Dento-alveolar Trauma II	0.5
INDI 6980	Scholarly Project for Medical Sciences	3
	Hours	**7**
Fourth Term		
DENT 6100	Pediatric Medicine Lecture	2
DENT 6110	Oral Health Policies	2
INDI 6980	Scholarly Project for Medical Sciences	1
DENT 6200	Oral Pathology	1
DENT 6150	Amer Board of Pediaric Dent RE	2
	Hours	**8**
Fifth Term		
DENT 6100	Pediatric Medicine Lecture	2
DENT 6110	Oral Health Policies	2
DENT 6160	Special Care Dentistry	1
INDI 6980	Scholarly Project for Medical Sciences ( )	2
	Hours	**7**
Sixth Term		
DENT 6100	Pediatric Medicine Lecture	2
INDI 6020	On Being a Scientist	1
INDI 6980	Scholarly Project for Medical Sciences ( )	5
	Hours	**8**
	Total Hours	**46**

- 1. Describe the normal oral flora and the host defense mechanisms that act against microbes in the oral cavity.
- 2. Identify the viral, bacteria and fungal agents (their structure, virulence factors and types of infections) that are pathogenic in the oral cavity and the implications of these infections to dentistry.
- 3. Describe strategies for modification of the normal oral flora.
- 4. Describe the pharmacokinetics and the pharmacodynamics of a broad spectrum of medications used in dental pharmacotherapy.
- 5. Discuss the decision making process of safe and effective therapeutic selection for treatment of illness/disease that is based on knowledge of pharmacology and pathophysiology.
- 6. Describe adverse effects, contraindications, and drug interactions of medications used in dental pharmacotherapy.
- 7. Demonstrate the ability to use effective communication and communicative behavior guidance techniques accepted by the American Dental Association (ADA) to achieve cooperation of adults and children in the dental environment. \n
- 8. Identify the cognitive, emotional and social development stages of children, adolescents and adults.

- 9. Demonstrate knowledge of and skill in non-communicative behavior guidance such as protective stabilization, conscious sedation and general anesthesia, and identify which behavior guidance techniques are appropriate in the contemporary management of adults and children in the dental environment.
- 10. Identify and describe the anatomy and development of the head and neck, particularly the oral cavity and face, and be able to predict the results of abnormal development of these structures.
- 11. Describe the current and classic literature for diagnosis and treatment planning, prevention, restorative dentistry, pulp therapy and trauma.
- 12. Describe the components of good research, and critically evaluate the literature for quality and substance.
- 13. Describe the components of orthodontic records, and the importance of cephalometric and facial esthetic evaluation in the diagnosis of orthodontic/orthopedic abnormalities.
- 14. Assess patients in the skeletal, dental, functional and esthetic domains and identify those interceptive orthodontic cases that are appropriate for treatment.
- 15. Describe in detail the preparation and management of medical emergencies in the dental setting, including those related to sedation.
- 16. Describe the indications, contraindications, and protocols for medically and physically compromised patients.
- 17. Describe acquired, developmental and genetic disorders commonly found in the pediatric population and later seen in adults and then developing proper differential diagnoses and appropriate management. \n
- 18. Appropriately diagnose and manage injuries to the oral cavity, including major trauma and appropriate referrals to medical colleagues as determined by the extent of the patients deficit or condition.

MSBS in Physician Assistant Studies

Physician Assistants (PAs) are health professionals prepared to practice medicine with physician supervision. Within the physician/PA relationship, PAs exercise autonomy in decision-making and provide a wide range of diagnostic and therapeutic services. The role of the PA includes provision of primary and specialty care in medical and surgical practices located in rural, urban or suburban areas. Physician assistant practice is centered on patient care but may include education, research and administrative duties.

The University of Toledo (UToledo) Physician Assistant (PA) Program is a professional entry-level course of study enabling individuals who hold baccalaureate degrees to become PAs. The program is designed to prepare graduates for primary care practice with emphasis placed on both service to medically under-served populations and the team approach to the delivery of healthcare. The program integrates graduate level critical thinking and analysis, problem solving, scientific inquiry, self-directed learning, and the effective use of modern technology for professional practice that includes elements of research, leadership, education and continued professionalization of the physician assistant occupation.

The Physician Assistant Program admit 40 students each Fall Semester (August). The application cycle opens in April of the year prior to enrollment and closes September 1 of the year prior to enrollment.

Admission Requirements:

- CASPA application (https://caspa.liaisoncas.com/applicant-ux/#/login) submitted by September 1
- UToledo application fee (https://secure.touchnet.net/C20238_ustores/web/store_cat.jsp?STOREID=97&CATID=124&SINGLESTORE=true) submitted by September 1
- Bachelor's degree completed by June 15 of the year of potential matriculation
- Completion of prerequisite courses by June 15 of the year of potential matriculation
- Overall GPA of 3.20 (CASPA Calculated)
- Prerequisite GPA of 3.20 (CASPA Calculated)
- Applicants are recommended to submit CASPER (Altus Suite – admissions assessments of non-cognitive skills) (https://acuityinsights.app/) scores.
- Applicants are recommended to submit PA-CAT (https://www.pa-cat.com/)scores.

Early submission of online CASPA and online UToledo Supplemental Application is encouraged. Interviews will be conducted virtually starting June/July and continue through October. The program may offer admission to individuals at any time during the application cycle.

Prerequisites

The following prerequisites must be completed with a grade of "C" or better with the exception of the Anatomy and Physiology courses*. A grade of C- will not be accepted. Applicants must have grades of B- or better in Anatomy and Physiology.

1. Anatomy (3 semester credit hours)**
2. Physiology (3 semester credit hours)**
3. General/Inorganic Chemistry (3 semester credit hours)
4. General/Inorganic Chemistry Lab (1 semester credit hours)***
5. Organic/Bio Chemistry (3 semester credit hours)
6. Organic/Bio Chemistry lab (1 semester credit hours)***
7. Microbiology (3 semester credit hours)
8. Microbiology lab (1 semester credit hours)***
9. Psychology (3 semester credit hours)
10. Psychology (3 semester credit hours)
11. College-level math or Statistics (3 semester credit hours)

12. Medical Terminology (1 semester credit hour)

*For applicants enrolled at institutions that utilize a point system for course grades, the program will accept a 3.0 for a B and 2.0 for a C. Any grade lower than 2.0 is unacceptable.

**Six credit hours of Anatomy & Physiology (i.e., A&P I and II) will be accepted. The program will accept some 5 credit hour A&P courses as meeting the requirements. These courses need to be reviewed and approved.

***The laboratory will be recognized as an independent course if it is completed separately from the main course.

For applicants enrolled at institutions that use a quarter system, credit hours are converted such that five (5) quarter hours = three (3) semester hours.

The prerequisite coursework identified above must be completed within **eight (8) years** of potential matriculation.

If you have any questions, please email PhysicianAssistant@utoledo.edu (physicianassistant@utoledo.edu).

Some degree of preference will be given to applicants who are:

- Ohio resident
- UToledo graduate
- Military veteran
- Non-traditional (≥25 years old)
- First-generation college graduate
- Economically disadvantaged
- From a rural area

Candidates will need to have the following submitted before matriculation:

- Clean BCI and FBI background checks
- Health requirements:
  - Physical Exam (yearly)
  - 2-Step PPD
  - Tetanus, diphtheria, and acellular (T-DAP) or Tetanus-diphtheria within the last 10 years
  - Immunization records for Measles, Mumps, Rubella, Varicella (chicken pox) or proof of immunity by titer
  - Immunization records for Hepatitis B vaccination and a positive Hepatitis B Surface Antibody
  - Influenza vaccinations annually. COVID-19 vaccination is not required, however, it is strongly recommended.
- Current Basic Life Support (BLS) card

EDUCATIONAL REQUIREMENTS FOR STATE LICENSURE
Completion of the University of Toledo ARC-PA (http://www.arc-pa.org/) accredited PA Program meets the educational degree requirements to apply for Physician Assistant licensure in all states. More information can be found on The University of Toledo State Authorization website (https://www.utoledo.edu/offices/internalaudit/institutional-compliance/state-authorization/pld-statelicensingboardsforphysicianassistants.html).

Code	Title	Hours
ANAT 5000	Anatomy	6
PHSL 5050	Human Physiology	4
PHYA 5010	Introduction to PA Profession	1
PHYA 5100	Principle Interview/Medical History	2
PHYA 5130	Patient Evaluation	4
PHYA 5140	Health Care Teams and Systems	2
PHYA 5210	Diagnostic and Therapeutic Skills I	2
PHYA 5220	Diagnostic and Therapeutic Skills II	4
PHYA 5230	Diagnostic and Therapeutic Skills III	5
PHYA 5310	Clinical Medicine I	5
PHYA 5400	Pathophysiology I	4
PHYA 5340	Clinical Medicine II	5
PHYA 5330	Clinical Medicine III	6
PHYA 5410	Pathophysiology II	4
PHYA 5430	Pathophysiology III	2
PHYA 5510	Fundamentals of Pharmacology I	4
PHYA 5520	Fundamentals of Pharmacology II	3
PHYA 5530	Fundamentals of Pharmacology III	1
PHYA 6010	Clinical Genetics	1
PHYA 6050	Ethics for PA Profession	1
PHYA 6110	Population and Lifestyle Medicine	3
PHYA 6130	Evidence Based Medicine	3
PHYA 6150	Behavioral Science	2
PHYA 6310	Clinical Rotation - Psychiatric and Behavioral Health	5
PHYA 6320	Clinical Rotation - Elective	5
PHYA 6330	Clinical Rotation - Emergency Medicine	5
PHYA 6340	Clinical Rotation - Family Medicine	5
PHYA 6350	Clinical Rotation - Internal Medicine	5
PHYA 6360	Clinical Rotation - Pediatrics	5
PHYA 6370	Clinical Rotation - Surgery	5
PHYA 6380	Clinical Rotation - Gynecologic, Sexual, and Reproductive Health	5
PHYA 6500	Introduction to Clinical Practice	4
PHYA 6610	Scholarly Project I	1
PHYA 6620	Scholarly Project II	1
PHYA 6630	Scholarly Project III	1
Total Hours		**121**

First Year		
First Term		**Hours**
ANAT 5000	Anatomy	6
PHSL 5050	Human Physiology	4
PHYA 5010	Introduction to PA Profession	1
PHYA 5100	Principle Interview/Medical History	2
PHYA 5140	Health Care Teams and Systems	2
	Hours	**15**
Second Term		
PHYA 5130	Patient Evaluation	4
PHYA 5210	Diagnostic and Therapeutic Skills I	2
PHYA 5310	Clinical Medicine I	5
PHYA 5400	Pathophysiology I	4
PHYA 5510	Fundamentals of Pharmacology I	4
PHYA 6050	Ethics for PA Profession	1
	Hours	**20**
Third Term		
PHYA 5220	Diagnostic and Therapeutic Skills II	4
PHYA 5340	Clinical Medicine II	5
PHYA 5410	Pathophysiology II	4
PHYA 5520	Fundamentals of Pharmacology II	3
PHYA 6110	Population and Lifestyle Medicine	3
	Hours	**19**
Second Year		
Fourth Term		
PHYA 5230	Diagnostic and Therapeutic Skills III	5
PHYA 5330	Clinical Medicine III	6
PHYA 5430	Pathophysiology III	2
PHYA 5530	Fundamentals of Pharmacology III	1
PHYA 6010	Clinical Genetics	1
PHYA 6130	Evidence Based Medicine	3
PHYA 6150	Behavioral Science	2
	Hours	**20**
Fifth Term		
PHYA 6310	Clinical Rotation - Psychiatric and Behavioral Health	5
PHYA 6320	Clinical Rotation - Elective	5
PHYA 6330	Clinical Rotation - Emergency Medicine	5
PHYA 6500	Introduction to Clinical Practice	4
PHYA 6610	Scholarly Project I	1
	Hours	**20**
Sixth Term		
PHYA 6340	Clinical Rotation - Family Medicine	5
PHYA 6350	Clinical Rotation - Internal Medicine	5
PHYA 6620	Scholarly Project II	1
	Hours	**11**
Third Year		
Seventh Term		
PHYA 6360	Clinical Rotation - Pediatrics	5
PHYA 6370	Clinical Rotation - Surgery	5
PHYA 6380	Clinical Rotation - Gynecologic, Sexual, and Reproductive Health	5
PHYA 6630	Scholarly Project III	1
	Hours	**16**
	Total Hours	**121**

- PLO 1: Demonstrate foundational medical knowledge of anatomy, etiology, pharmacology, pathophysiology, genetics, clinical presentation, and evidence-based treatment principles related to illnesses, injuries, and disease states.
- PLO 2: Perform a comprehensive and accurate history and physical exam that leads to data acquisition to formulate accurate differential diagnoses.
- PLO 3: Order, perform, and critically evaluate laboratory, imaging, and ancillary studies that will supplement the history and physical exam and improve diagnostic accuracy.
- PLO 4: Document and communicate medical information effectively in oral, written, and electronic formats to enhance communication between healthcare providers.
- PLO 5: Integrate clinical decision-making skills to interpret clinical data and patient preferences to design, perform, and manage pharmacologic, non-pharmacologic, and procedural interventions tailored to the patient's needs.
- PLO 6: Demonstrate effective, patient-centered communication skills to establish therapeutic relationships with patients and their families characterized by honesty, trust, compassion, and respect.
- PLO 7: Model professionalism and consistently apply ethical and legal standards that uphold respect for the patient and society.
- PLO 8: Formulate patient-centered care strategies across the lifespan that integrate cultural, gender, and socio-economic considerations for preventive, acute, emergent, chronic, rehabilitative, palliative, and behavioral and mental health care.
- PLO 9: Design evidence-based disease prevention and health promotion strategies to sustain the health of individuals and communities.
- PLO 10: Deliver compassionate and culturally sensitive patient education and counseling that enhances understanding and adherence to therapeutic regimens and reduces morbidity.
- PLO 11: Utilize and appraise principles of evidence-based practice by critically assimilating scientific evidence and committing to continuous learning and quality improvement.
- PLO 12: Collaborate effectively within interprofessional healthcare teams and systems by leveraging each member's unique strengths to optimize patient outcomes.

Graduate Certificate in Bioinformatics and Biomarkers

The Biomarkers and Bioinformatics (BRIM) Certificate Program introduces students to the rapidly growing fields of bioinformatics, proteomics and genomics, and provides core knowledge of analytical approaches used in these fields. It is particularly valuable for PhD

students whose research would be strengthened by expertise in bioinformatics.

Applying to the BRIM/BPG Certificate Program

UT students who are currently in a PhD program:

1. Complete the Request to Add a Graduate Certificate form (https://www.utoledo.edu/graduate/files/Request_to_add_a_grad_certific.pdf) and return to the Graduate School for processing.
2. Submit a letter of support from major advisor.

Applicants who are NOT UT graduate students:

1. Complete the online application (https://www.utoledo.edu/graduate/apply/).
2. Submit Official transcripts
3. Earned bachelors or graduate degree
4. Statement of Purpose
5. Two letters of recommendation are required, up to three letters will be accepted. In the event that a student decides to pursue the BIPG MSBS degree, it will save time to have three letters of recommendation already on file.

MD/MSBS Bioinformatics Degree

This is designed for students already in our MD program who want preparation for clinical research in gene therapy, biomarker discovery, or other aspects of cutting-edge medicine. It involves one year of coursework and research between the 2nd and 3rd years of the standard medical curriculum.

BS/MSBS "Pipeline" Program

This is an integrated program that can be completed in as little as 5.5 years, yielding both a University of Toledo Bachelors of Sciences in Biological Sciences and an MSBS in Bioinformatics. This reduced time is made possible in part by 9 credit hours being allowed to count towards both degrees. University of Toledo biology majors typically apply at the end of their second year, but may apply as incoming first-year students. For more information, go to the Pipeline Program website (https://www.utoledo.edu/med/depts/bioinfo/pages/Pipeline.html).

Students enrolled in the BRIM Certificate Program take three courses covering the following subject areas:

1. Fundamentals of BPG: introduction to the scope of bioinformatics, proteomics and genomics
2. Statistical Methods in Bioinformatics: training in statistical methods used in biomarker research and bioinformatics
3. One of the following classes:
   a. Introduction to Bioinformatic Computation: handling and manipulation of databases and introduction to computer programming skills needed to analyze large quantities of nucleic acid and protein sequence data
   b. Applications of BPG: faculty members using these methods will discuss and demonstrate how these techniques are utilized to solve research problems
   c. Biomarker Discovery, Validation and Implementation: faculty will provide an overview of biomedical discovery and validation techniques followed by application in selected aspects of individualized medicine.

Upon completion of the Program, students will be prepared to utilize biomarker research and bioinformatics techniques, and be able to interact with specialists in a range of biomedical sub-disciplines.

The curriculum consists of three, 3-credit courses, for a total of 9 credits, that can be taken over 1-4 years: BPG – (Bioinformatics and Proteomics/Genomics; BRIM-Biomarker Research and Individualized Medicine). The following shows the five available courses. The choice of which three courses to take should be made in consultation with the Program Director. Of BRIM 6200 and BIPG 6400, only one may be applied to the certificate.

Code	Title	Hours
Select three of the following:		9
BIPG 5100	Fund Bioinformatics Proteomics	
BIPG 5200	Statistical Methods in Bioinformatics	
BIPG 6100	Bioinformatic Computation	
If only two of the above courses are chosen then select one of the two courses below:		
BRIM 6200	Biomarker Disc,Valid & Impleme (even years)	
BIPG 6400	Applications of Bioinformatics (odd years)	

The curriculum consists of three, 3-credit courses, for a total of 9 credits (listed below) that can be taken over 1-4 years: (BPG – Bioinformatics and Proteomics/Genomics; BRIM- Biomarker Research and Individualized Medicine). Successful completion of any THREE of the following FIVE courses, except that only ONE of the two: "Applications in Bioinformatics" and "Biomarker Discovery, Validation and Implementation" may be taken due to partial overlap in their content.

BIPG 5100 Fundamentals in Bioinformatics
BIPG 5200 Statistical Methods in Bioinformatics
BIPG 6100 Bioinformatic Computation

If only two of the above courses are chosen then select:
EITHER BRIM 6200 Biomarker Discovery, Validation, and Implementation (even years) OR BIPG 6400 Applications in Bioinformatics (odd years)

*BMSP 6340 Current Problems & Research Approaches in Genes and Genomes, or equivalent course approved by the BRIM/BPG Program, is required for admission into the Bioinformatics & Biomarkers Certificate Program.

First Term		Hours
BIPG 5100	Fund Bioinformatics Proteomics	3
BIPG 5200	Statistical Methods in Bioinformatics	3
	Hours	**6**
Second Term		
BIPG 6100 or BIPG 6400 or BRIM 6200	Bioinformatic Computation or Applications of Bioinformatics or Biomarker Disc,Valid & Impleme	3

	Hours	**3**
	Total Hours	**9**

BMSP 6340 Current Problems & Research Approaches or equivalent course approved by the BRIM/BPG Program, is required for admission into the Bioinformatics & Biomarkers Certificate Program.

NOTES: The above Plan of Study grid is only an example. University of Toledo PhD or MSBS students may also take individual BPG or BRIM courses as electives, with permission of the instructor. To receive a Certificate in Biomarkers and Bioinformatics, however, an online application to the program must be submitted and accepted. All applications will be reviewed by the BIPG Program Admissions Committee. The online application must be filed ONLY for those seeking a certificate, and is not required for those taking these courses as electives.

- PLO 1: Students are able to describe and explain mammalian and nonmammalian genome structure and function.
- PLO 2: Students are able to describe and explain processes of genome evolution.
- PLO 3: Students are able to describe and use analytic tools associated with systems/bioinformatic approaches.
- PLO 4: Students are able to choose and use appropriate tests for statistical analysis of macromolecular sequence information.
- PLO 5: Students are able to apply bioinformatic methods to clinically-relevant problems, and describe and explain a) biomarker discovery and validation, and b) major human diseases such as cancer, diabetes, and autoimmunity.

Graduate Certificate in Clinical Bioinformatics

Code	Title	Hours
BIPG 5100	Fund Bioinformatics Proteomics	3
or BIPG 5200	Statistical Methods in Bioinformatics	
BIPG 6400	Applications of Bioinformatics	3
or BIPG 6200	Advanced Programming in Bioinformatics	
or BIPG 6500	Applied Statistics for Bioinformatics	
BIPG 5120	Clinical Bioinformatics	3
or BIPG 7120	Clinical Bioinformatics	
Total Hours		**9**

First Year		
First Term		**Hours**
BIPG 5100	Fund Bioinformatics Proteomics	3
	Hours	**3**
Second Term		
BIPG 6400 or BIPG 6200 or BIPG 6500	Applications of Bioinformatics or Advanced Programming in Bioinformatics or Applied Statistics for Bioinformatics	3
	Hours	**3**
Third Term		
BIPG 5120 or BIPG 7120	Clinical Bioinformatics or Clinical Bioinformatics	3
	Hours	**3**
	Total Hours	**9**

- 1) Apply clinical bioinformatics theories, methods and tools related to personal health, health care, public health, and biomedical research (for example): a) Work with and evaluate electronic health records, b) Work with and evaluate national health databases, c) Work with and evaluate omics repositories, d) Integrate clinical and omics data.
- 2) Describe analytic tools associated with systems/bioinformatic approaches, including (for example): a) Transcriptomics – microarray analysis vs. deep sequencing, b) Proteomic mass spectroscopic methods (identification and abundance), c) Determination and structure of interaction networks, d) Functional network maps.
- 3) Apply Intelligent Data Analysis Techniques including (for example): a) Dimension reduction techniques, b) Heuristic search techniques, c) Intelligent interfacing techniques.
- 4) Describe application of bioinformatic methods to clinical problems, by demonstrating understanding of: a) Biomarker discovery and validation, b) Major diseases such as cancer, diabetes, cardiovascular, and autoimmunity.

Graduate Certificate in Pathology Fellowship

The Graduate Certificate in Pathology is a year-long program designed for medical students to compete between their second year of medical school and their clinical work.

Student Learning Objectives

At the end of the fellowship, the students will be able to:

Autopsy Service

- perform a complete autopsy including evisceration, dissection and examination of the various organs including brain
- describe grossly and microscopically all organs from a given autopsy and provide a clinicopathologic correlation as to the cause of death

Surgical Pathology

- Perform gross and microscopic examinations on surgical specimens
- cut, stain and review frozen sections
- interpret frozen sections
- interpret gross and microscopic surgical pathology specimens

Clinical Pathology

- interpret peripheral blood smears
- provide clinicopathologic correlations for chemistry, microbiology and immunology tests
- interpret protein electrophoresis

Electives and Scholarly Activities

- analyze scientific articles
- interpret EM specimens
- interpret renal biopsies for adequacy and diagnosis
- prepare and present scientific papers at annual scientific day

Teaching

- teach second year medical school small groups

Students from LCME accredited medical schools who have completed their second or third year and are in good academic standing are eligible to apply for this program. While the American Board of Pathology gives up to 1 year credit toward certification for time spent as a Fellow, the Fellowship is not limited to those planning to make pathology a career.

- Successful completion of a second year or third year medical school curriculum from an LCME accredited medical school with grades equivalent to a GPA ≥ 3.0.
- GRE exam not required

Code	Title	Hours
PATH 6060	Surgical Clinical Rotation	7
PATH 6070	Intro Clinical Lab Medicine	3
PATH 6080	Postmortem Clinical Rotation	6
PATH 6890	Independent Study in Pathology	1
INDI 6980	Scholarly Project for Medical Sciences	3
Total Hours		**20**

First Term		Hours
PATH 6060	Surgical Clinical Rotation	3
PATH 6070	Intro Clinical Lab Medicine	3
PATH 6080	Postmortem Clinical Rotation	2
	Hours	**8**
Second Term		
PATH 6060	Surgical Clinical Rotation	2
PATH 6080	Postmortem Clinical Rotation	2
INDI 6980	Scholarly Project for Medical Sciences	2
	Hours	**6**
Third Term		
PATH 6060	Surgical Clinical Rotation	2
PATH 6080	Postmortem Clinical Rotation	2
PATH 6890	Independent Study in Pathology	2
	Hours	**6**
	Total Hours	**20**

- PLO 1. To perform a complete autopsy including gross and microscopic examination as well as clinical pathology correlation.
- PLO 2. To perform gross and microscopic assessment of surgical pathology specimens including the interpretation of frozen and permanent sections.
- PLO 3. To interpret clinical laboratory tests and provide correlations with patient's clinical condition.
- PLO 4. Scholarly project. Develop a researchable question, use appropriate research strategies and techniques to generate a scholarly response to the question and the finds of the project will be presented at the departments annual scientific day.

College Policies (Graduate Handbook)

College Of Graduate Studies

- College of Graduate Studies (p. 407)
- College Policies and Procedures and Handbook (p. 407)
- Academic Regulations (p. 412)
- Graduate Academic Policies (https://www.utoledo.edu/policies/academic/graduate/)

Graduate Programs

The College of Medicine & Life Sciences at the University of Toledo offers several graduate-level degree and certificate programs. PhD and MS degrees in biomedical sciences and academic certificates are offered in several basic science and clinical Programs.

Admission to Graduate Programs

Admission requirements for the College of Graduate Studies are discussed in the general College of Graduate Studies (https://www.utoledo.edu/graduate/admission/requirements/) section of the University of Toledo Catalog; other admission procedures are described under the individual graduate programs. Admission to graduate study in the College of Medicine & Life Sciences is open to graduates of accredited colleges and universities meeting the minimum admission requirements of the College of Graduate Studies as well as specific admission requirements of each program. Previously admitted students wishing to transfer to a different program must apply for admission to the new program. Admission to one graduate program does not guarantee admission to another graduate program. Please refer to the degree or program descriptions for specific information.

Administration of Programs

All graduate programs in the College of Medicine & Life Sciences (COMLS) are administered jointly by COMLS and the College of Graduate Studies of the University of Toledo. Applicants may contact specific programs, the College's Associate Dean for COMLS graduate programs, or the College of Graduate Studies for further information on programs or admission requirements. Applicants should be aware that course names/credit hours may be revised over the course of the program per program requirements. Please consult with your program regarding course/credit hour changes.

Advising

Students must meet with their faculty advisor for the purpose of developing a Plan of Study. It is the student's responsibility to meet all requirements for the degree as specified by the graduate program, the department, the College of Graduate Studies and the University of Toledo. Students are encouraged to create the Plan of Study no later than the

first academic year and submit the completed, signed form to the College of Graduate Studies.

Academic Standards

In addition to the academic standards outlined in the College of Graduate Studies Catalog, the maximum number of credits of a grade C or better allowed on a candidate's Plan of Study are:

- 10 credits PhD degree (biomedical sciences - all tracks)
- 8 credits MSBS research tracks (including CCB, MOME, MMI, NND, and BIOI).
- 11 credits Physician Assistant Program (PA)
- 12 credits MSBS clinical track programs including MS Medical Sciences (unless stated otherwise)
- 3 credits Certificate programs

In addition, students in all graduate programs at UT must earn a cumulative GPA of 3.0 to graduate.

Departments/Divisions

Department of Cell and Cancer Biology (p. 184)

Department of Family Medicine (p. 185)

Department of Medical Microbiology & Immunology (p. 186)

Department of Neurosciences and Psychiatry (p. 187)

Department of Pathology (p. 188)

Department of Physiology & Pharmacology (p. 189)

Department of Radiology and Department of Radiation Oncology (p. 191)

Department of Urology (p. 195)

Division of Dentistry (p. 195)

Department of Cell and Cancer Biology

Jian-Tian Zhang, Ph.D., Chair
Xiaohong Li, Ph.D., Track Director

The Cell and Cancer Biology (CCB) track within the Biomedical Science Program at the University of Toledo fosters young scientists to become independent investigators who understand the molecular and genetic basis of cancer and have the knowledge of cell biology to develop improved therapies for human cancer. Students in the CCB track develop critical and logical thinking and laboratory skills to approach cancer research questions in ways that will best lead to success. Program graduates move on to become successful scientists and leaders in academia, government, and industry. CCB students may pursue the Doctor of Philosophy (PhD) degree or, after acceptance into the medical school, a combined MD/PhD degree. A Masters' degree in CCB is also currently offered.

CCB program faculty research interests and areas of expertise are: 1) Control of tumor cell growth and death, 2) Signal transduction, 3) Mechanisms of cancer cell motility and chemotaxis, 4) Invasion and metastasis, 5) Molecular genetics of cancer risk, 6) Influence of tumor microenvironment on cancer progression and metastasis, 7) Drug resistance, 8) Chromatin remodeling and epigenetic regulation of oncogenes and drug resistance. 9) DNA damage signaling and repair, 10) Drug discovery and delivery, 11) Autophagy and cancer metabolism, and 12) Aging and cancer.

Cell and Cancer Biology PhD students enroll in a first-year core curriculum that is designed to provide foundational knowledge for cutting edge research. The first-year curriculum provides students with a comprehensive overview of molecular and cellular biology, systems pathophysiology, modern research methodology, and statistical analysis. During the first two semesters, students complete three rotations then identify an advisor and join a Cell & Cancer Biology laboratory for their dissertation research project. Doctoral students in good academic standing are supported financially by a tuition scholarship, stipend and health insurance during their academic training. This financial assistance does not require the student to be a Teaching Assistant for undergraduates, thus enabling the student to more fully concentrate on his/her graduate program.

Admission Requirements:

- An earned degree: Baccalaureate (e.g., B.S., B.A.) or graduate degree (e.g. M.S.) granted by an accredited college or university.
- GPA: A 3.0 GPA (on 4.0 Scale) or higher from the institution granting the baccalaureate or graduate degree.
- Coursework: Prior coursework should have relevance to graduate studies in cell and cancer biology. Undergraduate upper division courses in biology, biochemistry, and chemistry, or equivalent coursework, with grades of C or higher are required. Additional courses in cell and molecular biology, physiology, statistics, and genetics are recommended
- Letters of Recommendation: Three or more letters of recommendation are required. Recommendation letters must be signed by the letter writer and full contact information for the letter writer must be provided. The letter should highlight the professional relationship between the applicant and/or academic preparations, and the intellectual contributions to the research project, if applicable.
- Statement of purpose: Applicants are required to provide a Statement of Purpose, which highlights academic and research training prior to application, CCB faculty and projects that are of particular interest to the applicant, and future career goals.
- Resume/CV: Applicants are required to submit a resume/curriculum vitae.
- A foreign credential evaluation (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fgraduate%2Fadmission%2Fforeign-credentialing%2Findex.html&data=05%7C02%7CKandace.Williams%40utoledo.edu%7C81fcd8b49d0f4bce063508de90152d2d%7C1d6b1707baa94a3da8f8deabfb3d467b%7C0%7C0%7C639106617776742213%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIwLjAuMDAwMCIsIlAiO%3D%3D%7C0%7C%7C

%7C&sdata=xEOx05On7DPht78ulUbaGJl7LKNg361nMGaFTvejVf0%3D&reserved=0) is required for all applicants who have completed coursework or degrees at non-US institutions.

- Proof of English Language Proficiency for Graduate Students (https://www.utoledo.edu/graduate/international/english-language-proficiency.html) is required for all applicants who have completed coursework or degrees at non-US institutions.
  - The following exceptions apply to Proof of English Proficiency exams:
  - Proof of citizenship from one of these countries (https://www.utoledo.edu/graduate/admission/requirements/english-test-exempt.html).
  - Successful completion of a US Bachelor's or Master's degree.
  - Successful completion of at least 24 credit hours of academic study at a US college or university.

Please note that students accepted into our program do not need to find a mentor before they matriculate. All students complete three laboratory rotations during their first year and then make a mutual decision with a mentor for their dissertation research.

Outstanding applicants are eligible to compete for University Fellowships after being admitted to this program. Please click search now (http://www.utoledo.edu/financialaid/scholarships/search/?utm_source=programs&utm_campaign=scholarship) for more information. Applications generally open in October and close at the beginning of March.

The CCB graduate track uses a holistic approach to assess and evaluate applicants. The CCB graduate Admissions Committee carefully considers each applicant's GPA, college/university where previous degrees were awarded, previous coursework, letters of recommendation, previous research experience, publications/presentations (if applicable), statement of purpose, and resume/CV. A virtual interview (e.g., Zoom, WebEx) will be conducted for top applicants.

Degrees Offered

- Biomedical Sciences: Cancer Biology, MSBS
- Biomedical Science: Cell and Cancer Biology, PhD

CABP 6250 Scientific Communication Skills and Career Goals
[2 credit hours]
Three-fourths of the course will be focused on individual, small group, and whole class participation in communication skills. One fourth of the class will be devoted to information and assessment of individual career options. Web based assessment tools and outside expertise will be recruited for this portion of the class.
Term Offered: Spring

CABP 6270 Advanced Cancer Biology
[3 credit hours]
A comprehensive examination of the cellular and molecular foundation of cancer. Topics to be covered include: neoplasia; epidemiology and etiology; the role of causative agents such as chemicals, radiation, and viruses; cell proliferation, injury, and death; oncogenes; tumor suppressor genes; and an overview of cancer therapy.
Term Offered: Spring, Fall

CABP 6560 Readings in Cancer Biology
[1 credit hour]
A readings and discussion course that will examine classic and current research publications from within the broad realm of cancer biology.
Term Offered: Spring, Fall

CABP 6730 Research in Cancer Biology
[1-15 credit hours]

CABP 6890 Ind Study in Cancer Biology
[1-15 credit hours]
Intensive study in the field of cancer biology including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring, Summer, Fall

CABP 6990 Thesis Research in Cancer Biol
[1-15 credit hours]

CABP 8250 Scientific Communication Skills and Career Goals
[2 credit hours]
Three-fourths of the course will be focused on individual, small group, and whole class participation in communication skills. One fourth of the class will be devoted to information and assessment of individual career options. Web based assessment tools and outside expertise will be recruited for this portion of the class.
Term Offered: Spring

CABP 8270 Advanced Cancer Biology
[3 credit hours]
A comprehensive examination of the cellular and molecular foundation of cancer. Topics to be covered include: neoplasia; epidemiology and etiology; the role of causative agents such as chemicals, radiation, and viruses; cell proliferation, injury, and death; oncogenes; tumor suppressor genes; and an overview of cancer therapy.
Term Offered: Spring, Fall

CABP 8560 Readings in Cancer Biology
[1 credit hour]
This course is designed for Ph.D students to develop professional skills in seminar comprehension, critical peer review, scientific presentation, and communication.
Term Offered: Spring, Fall

CABP 8730 Research in Cancer Biology
[1-15 credit hours]

CABP 8890 Ind Study in Cancer Biology
[1-15 credit hours]
Intensive study in the field of cancer biology including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring, Summer, Fall

CABP 9990 Dissertation Research CABP
[1-9 credit hours]
Formal intensive study of specific topics in cancer biology. Individual studies may include the application of both experimental and theoretical scientific methods, with the goal of advancing our understanding of human cancer. May be repeated for credit.
Term Offered: Spring, Summer, Fall

Department of Family Medicine

Linda Speer, MD, FAAFP, Department Chair

Kelly Izsak, MSBS, PA-C, Physician Assistant Studies Program Director

The Department of Family Medicine was first established in 1974 and consists of the Family Medicine Residency Program and the Physician Assistant Studies Program. Our mission is to improve the health of people of all ages in their family and community contexts through education, clinical practice, and the advancement of knowledge of our discipline.

Physician Assistants (PAs) are health professionals, prepared to practice medicine with physician supervision. Within the physician/PA relationship, PAs exercise autonomy in decision-making and provide a wide range of diagnostic and therapeutic services. The role of the PA includes provision of primary and specialty care in medical and surgical practices located in rural, urban or suburban areas. Physician assistant practice is patient care centered but may include education, research and administrative duties.

The University of Toledo (UToledo) Physician Assistant Program (p. 178) is a professional entry-level course of study enabling individuals who hold baccalaureate degrees to become PAs. The program is designed to prepare graduates for primary care practice with emphasis placed on both service to medically under-served populations and the team approach to the delivery of healthcare. The program integrates graduate level critical thinking and analysis, problem solving, scientific inquiry, self-directed learning and the effective use of modern technology for professional practice that includes elements of research, leadership, education and continued professionalization of the physician assistant occupation.

- MSBS in Physician Assistant Studies (p. 178)

Department of Medical Microbiology & Immunology

Z. Kevin Pan, Ph.D., Chair
Z. Kevin Pan, Ph.D., Co-Track Director
Travis Taylor, Ph.D., Co-Track Director

The Medical Microbiology and Immunology (MMIM) training program (formerly Infection, Immunity and Transplantation) at the University of Toledo on the Health Science Campus offers the PhD, MD/PhD, and MSBS degrees through the interdisciplinary degree programs in Biomedical Sciences. The primary goal of the doctoral program in Medical Microbiology and Immunology is to train students for independent, creative careers in research and/or teaching.

MMIM PhD students enroll in a first year core curriculum that provides a comprehensive overview of biochemistry/protein biology, molecular and cellular biology, molecular basis of diseases, research methodology, ethics, and statistical analyses. PhD students complete three laboratory rotations during their first year and join a MMIM laboratory during the spring semester of their first year. In the second year and beyond, MMIM PhD students take advanced and elective courses, including advanced immunology, advanced microbiology, current topics in MMIM (journal club and departmental seminar series), and dissertation research. Other training activities include formal research presentations at annual Medical Microbiology and Immunology Departmental retreats, Graduate Research Annual Forum (GRAF), and presentations at regional, national, and international conferences. All PhD students in good academic standing (GPA > 3.0) are supported by a tuition scholarship, living stipend and health insurance during their academic training. This financial assistance does not require the student to be a Teaching Assistant for undergraduates, thus enabling the student to concentrate on his/her graduate research. Teaching experiences can be arranged if a student desires this training as well. All PhD students are required to complete a written dissertation and defend their research project at a final oral defense before the degree will be conferred.

MMIM students are strongly encouraged to join laboratories of MMIM primary faculty. Other faculty in the College of Medicine and Life Sciences may have joint appointments in MMIM or may serve on graduate advisory committees. After joining a laboratory, a graduate advisory committee is jointly chosen by the student and advisor to promote academic progress toward completion of the PhD degree. The MMIM Department occupies recently renovated space and maintains state-of-the-art equipment to answer complex microbiology and immunology questions, including studies on host-pathogen interactions and immune-mediated diseases.

Degrees Offered

- Biomedical Science: Medical Microbiology & Immunology, MSBS (p. 169)
- Medical Microbiology & Immunology, PhD (p. 162)

MMIM 6020 Advanced Immunology
[1 credit hour]
Student led discussion of recent literature supporting key concepts in the human immune response. Discussions will focus on how current research impacts our understanding of specific responses.

MMIM 6030 Current Topics in MMI
[1 credit hour]
This course includes attendance at biweekly seminars given by invited speakers and, on an alternating biweekly basis, the presentation of papers related to the seminar topics. May be repeated for credit.
Term Offered: Spring, Fall

MMIM 6040 Advanced Microbiology
[1 credit hour]
Student led discussion of recent literature supporting key concepts in the microbiology field, with an emphasis on bacteria and viruses. Discussions will focus on how current research impacts our understanding of specific pathogens.

MMIM 6890 Research in MMI
[1-9 credit hours]
Intensive study in field of interest, including experimental work before the qualifying exam. May be repeated for credit.

MMIM 6990 Thesis Research in MMI
[1-9 credit hours]
Intensive study in field of interest, including experimental work after master's student passes the qualifying exam. May be repeated for credit.

MMIM 8020 Advanced Immunology
[1 credit hour]
Student led discussion of recent literature supporting key concepts in the human immune response. Discussions will focus on how current research impacts our understanding of specific responses.

MMIM 8030 Current Topics in MMI
[1 credit hour]
This course includes attendance at biweekly seminars given by invited speakers and, on an alternating biweekly basis, the presentation of papers related to the seminar topics. May be repeated for credit.
Term Offered: Spring, Fall

MMIM 8040 Advanced Microbiology
[1 credit hour]
Student led discussion of recent literature supporting key concepts in the microbiology field, with an emphasis on bacteria and viruses. Discussions will focus on how current research impacts our understanding of specific pathogens.

MMIM 8890 Research in MMI
[1-9 credit hours]
Intensive study in field of interest, including experimental work before the qualifying exam. May be repeated for credit.

MMIM 9990 Dissertation Research in MMI
[1-9 credit hours]
Intensive study in field of interest, including experimental work after Ph. D. student passes the qualifying exam. May be repeated for credit.

Department of Neurosciences and Psychiatry

Robert Smith, MD, PhD, Chair
Arun Anantharam, PhD, Track Director

The combination of molecular biology and genetics with modern neuroanatomical techniques is transforming both our ability to examine and to understand the nervous system. Ongoing research by the faculty in the Neurosciences and Neurological Disorders graduate program is providing insights into neurotransmission, sensory system function, development and plasticity of the nervous system, regeneration and repair following neural damage, the basis of neural disease, and behavior. As one of five biomedical science degree programs in the University of Toledo, College of Medicine & Life Sciences, the Neuroscience and Neurological Disorders program is an interdisciplinary course of study whose primary goal is to train students for independent, creative careers in biomedical research and/or teaching. The program awards both PhD and MSBS in biomedical sciences degrees and participates in the MD/PhD and MD/MSBS combined degree programs. Nationally-recognized, NIH-funded Neuroscience faculty who serve as research mentors are drawn from a number of departments including: Neurosciences, Neurology, Physiology and Pharmacology, Psychiatry and Radiation Therapy. Modern, state-of-the-art research laboratory and core facilities are available through the program and these participating departments.

The curriculum for the PhD degree consists of a core of concentrated course work in the first year, followed by specialized elective courses and an emphasis on laboratory research. Elective courses are offered in developmental and systems neuroscience, as well as ion channel function, sensory physiology, and neuropharmacology. During the first two semesters, each PhD student rotates through three research laboratories conducting short-term projects, gaining exposure to techniques and identifying potential areas for further investigation. At the end of the second semester, each student selects a major advisor who directs the student's doctoral research. A faculty committee is jointly chosen by the student and advisor to supervise academic progress toward completion of the PhD degree. In addition to 90 credit hours in didactic and research courses, PhD students are required to successfully pass a qualifying exam and to write and defend a research dissertation.

Degrees Offered

- Neuroscience and Neurological Disorders, PhD (p. 157)
- Bioinformatics & Biomarkers, Certificate (p. 180)

NNDP 6500 Seminar in Neuroscience
[0 credit hours]
Training and practice in presenting seminars on neuroscience research. May be repeated for credit.
Term Offered: Spring, Fall

NNDP 6540 Journal Paper Review Neuroscience
[1-2 credit hours]
A weekly report on recent advances in neurobiology taken from original papers to give the students an opportunity to find, critically assess, and report on these studies. Students will develop skills for communicating scientific ideas in a seminar format. May be repeated for credit.
Term Offered: Spring

NNDP 6890 Independ Study in Neuroscience
[1-12 credit hours]
Independent library and laboratory work under the supervision of the major advisor. May be repeated for credit.
Term Offered: Summer, Fall

NNDP 6910 Biomedical Publishing
[1 credit hour]
Academic and student development course offering an introduction to an open access peer reviewed journal. Offers strategies to gain a better understanding of this example of journal system by examining and eventually assisting with The University of Toledo Journal of Medical Sciences (Translation) through process, procedures, and application.
Term Offered: Spring, Summer, Fall

NNDP 6990 Thesis Research Neurosci Neuro
[1-15 credit hours]

NNDP 7010 Functional Neuroanatomy
[3 credit hours]
The goal of this course is to provide the student with a detailed understanding of multiple aspects of functional neuroanatomy.
Term Offered: Fall

NNDP 8500 Seminar in Neuroscience
[1 credit hour]
Training and practice in presenting seminars on neuroscience research. May be repeated for credit.
Term Offered: Spring, Fall

NNDP 8540 Journal Paper Review Neuroscience
[1-2 credit hours]
A weekly report on recent advances in neurobiology taken from original papers to give the students an opportunity to find, critically assess, and report on these studies. Students will develop skills for communicating scientific ideas in a seminar format. May be repeated for credit.
Term Offered: Spring

NNDP 8990 Research in Neuroscience
[1-15 credit hours]
Formal intensive study of specific topics in neuroscience. Individual studies may include the application of both experimental and theoretical scientific methods, with the goal of advancing our understanding of how the brain works and influences behavior. May be repeated for credit.
Term Offered: Spring, Summer, Fall

NNDP 9990 Dissertation Research in NNDP
[1-9 credit hours]
Formal intensive study of specific topics in neuroscience. Individual studies may include the application of both experimental and theoretical scientific methods, with the goal of advancing our understanding of how the brain works and influences behavior. May be repeated for credit.
Term Offered: Spring, Summer, Fall

Department of Pathology

Nicole Dominiak, Program Director

Degrees Offered

- MSBS ASSISTANT IN PATHOLOGY (p. 163)

PATH 6040 Pathology Assistants: Medical Ethics
[1 credit hour]
This course is an introduction to Medical Ethics for the Pathology Assistant. Focus is on the issues faced by the pathologist and pathology assistants. The course will be seminar based and will involve presentations and case discussions.
Term Offered: Spring

PATH 6050 Clinical Neuropathology
[1 credit hour]

PATH 6060 Surgical Clinical Rotation
[0-4 credit hours]
Introduces students to surgical pathology and cytology including gross evaluation of tissues, tissue processing and microscopic evaluation of diseased human tissues to render a diagnosis, recommend treatment and evaluate prognosis. In addition, students will attend and/or present case materials at conferences.
Term Offered: Spring, Summer, Fall

PATH 6070 Intro Clinical Lab Medicine
[0-4 credit hours]
An introductory course designed to acquaint students with the laboratory tests that are available in the clinical laboratory, prioritization of test ordering, how the tests are performed and their usefulness in clinical diagnosis and clinical investigation.
Term Offered: Spring, Summer, Fall

PATH 6080 Postmortem Clinical Rotation
[0-4 credit hours]
An introductory course designed to acquaint students with the autopsy. It consists of a series of lectures, demonstrations and readings pertaining to the human autopsy. Students will be involved in the actual performance of autopsies, the selection of appropriate tissues for microscopic examination, microscopic examination of tissues, rendering a diagnosis and completing autopsy reports. The autopsies are performed at MCO and the Lucas County Coroner's Office.
Term Offered: Spring, Summer, Fall

PATH 6720 Current Topics in Pathology
[1-4 credit hours]
A lecture and/or seminar course in topics of current interest in pathology with special emphasis on the fundamentals of mammalian, especially human, life under normal, experimental, or pathological conditions. Students and department faculty will present and moderate the discussion of original research publications. May be repeated for credit.

PATH 6730 Research in Pathology
[1-4 credit hours]
Students will participate in selected ongoing research programs of the department faculty. May be repeated for credit.

PATH 6770 Embryology and Teratology
[1 credit hour]
This course provides a post-graduate level understanding of molecular, genetic, cellular and environmental mechanisms involved in: 1. Early human embryonic development i.e. primordial germ cell information, gamete formation, fertilization, blastulation, implantation and gastrulation (formation of bilaminar and trilminar germ discs) and associated pathological malformations or diseases and 2. Normal and abnormal development of selected tissues, body organs and systems, and their pathological manifestations.
Term Offered: Spring

PATH 6780 Histology and Cell Physiology I
[2 credit hours]
The course is intended to introduce histologic techniques including tissue fixation, processing, staining, mircrotomy, and the special techniques of histochemistry and immunocytochemistry for light microscopy: in addition basic optics and the use of bright field, phase contrast and fluorescence microscopy will be addressed. The course will integrate microscopic anatomy. The course is intended to integrate microscopic anatomy with tissue specific physiology. The course schedule is designed to meld with the disease content of the organ systems of the medical school curriculum to provide a basis of normal microscopic anatomy (histology) and specific functions of organ specific cell types. There is a strong emphasis on independent study of cell physiology to accompany didactic presentations of microscopic anatomy including utilization of virtual tissue slides.
Prerequisites: ANAT 5000 with a minimum grade of D-

PATH 6790 Histology and Cell Physiology II
[2 credit hours]
The course is intended to integrate microscopic anatomy with tissue specific physiology. The course schedule is designed to meld with the disease content of the organ systems of the medical school curriculum to provide a basis of normal microscopic anatomy (histology) and specific functions of organ specific cell types. There is a strong emphasis on independent study of cell physiology to accompany didactic presentations of microscopic anatomy including utilization of virtual tissue slides.
Prerequisites: PATH 6780 with a minimum grade of D-

PATH 6890 Independent Study in Pathology
[0-12 credit hours]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring, Summer, Fall

PATH 7050 Clinical Neuropathology
[1 credit hour]

PATH 7125 Laboratory Management
[4 credit hours]
This course provides students with the background information needed to step into management or supervisory roles in a laboratory setting. The five management topics covered in this course are Operations, Informatics, Compliance, Personnel Management, and Financial Management. This course is online only
Term Offered: Spring

PATH 7130 Pathology
[1-6 credit hours]
This course is designed to acquaint students with the basic concepts of general and systems-based pathology using didactic lectures to teach general pathologic mechanisms as well as organ specific pathology. Students will learn to correlate normal anatomy, gross examination and microscopic diagnosis. An emphasis will be placed on cancer staging using CAP cancer protocols. Students will continue to perform gross examination throughout this course allowing them to connect and apply concepts from their didactic sessions with the specimens they are dissecting.
Prerequisites: ANAT 5000 with a minimum grade of C
Term Offered: Spring, Fall

PATH 8050 Clinical Neuropathology
[1 credit hour]

PATH 8060 Intro Surgical Path and Cytolo
[1-4 credit hours]
Introduces students to surgical pathology and cytology including gross evaluation of tissues, tissue processing and microscopic evaluation of diseased human tissues to render a diagnosis, recommend treatment and evaluate prognosis. In addition, students will attend and/or present case materials at conferences.

PATH 8070 Intro Clinical Lab Medicine
[1-4 credit hours]
An introductory course designed to acquaint students with the laboratory tests that are available in the clinical laboratory, prioritization of test ordering, how the tests are performed and their usefulness in clinical diagnosis and clinical investigation.

PATH 8080 Intro Postmortem Pathology
[1-4 credit hours]
An introductory course designed to acquaint students with the autopsy. It consists of a series of lectures, demonstrations and readings pertaining to the human autopsy. Students will be involved in the actual performance of autopsies, the selection of appropriate tissues for microscopic examination, microscopic examination of tissues, rendering a diagnosis and completing autopsy reports. The autopsies are performed at MCO and the Lucas County Coroner's Office.

PATH 8720 Current Topics in Pathology
[1-4 credit hours]
A lecture and/or seminar course in topics of current interest in pathology with special emphasis on the fundamentals of mammalian, especially human, life under normal, experimental, or pathological conditions. Students and department faculty will present and moderate the discussion of original research publications. May be repeated for credit.

PATH 8730 Research in Pathology
[1-4 credit hours]
Students will participate in selected ongoing research programs of the department faculty. May be repeated for credit.

PATH 8890 Independent Study in Pathology
[1-12 credit hours]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit.

Department of Physiology and Pharmacology

Bina Joe, Ph.D., chair
Jennifer Hill, Ph.D., track director

The Department of Physiology & Pharmacology hosts the Molecular Medicine (MOME) track (formerly Cardiovascular and Metabolic Diseases) in the Biomedical Sciences Graduate program at The University of Toledo College of Medicine & Life Sciences. MOME nurtures students and provides them with the necessary tools to pursue an independent career in biomedical sciences. This program encompasses a unique interdisciplinary approach to train students to conduct research in the underlying molecular mechanisms of diseases that have profound impact on human health.

The program draws on faculty research strengths in signal transduction, genetics, molecular and cellular biology, gene microarrays, genomics, proteomics, gene knockout and transgenics, tissue culture, and protein and carbohydrate biochemistry. The MOME faculty members are not only drawn from its associated department, the Department of Physiology and Pharmacology, and from the Center for Diabetes and Endocrine Research (CeDER), but also from other departments including the Departments of Medicine and Orthopedic Surgery. Modern, well-equipped research facilities are available through the participating departments. The MOME program offers degrees of Doctor of Philosophy (PhD) and Masters in Biomedical Sciences (MSBS). The program also offers these graduate degrees in combination with the Medical Degree (MD) that is offered by the medical school. Students from the four programs, PhD, MSBS, MD/PhD and MD/MSBS, follow a well-defined program that includes core courses, journal clubs, seminars, laboratory rotations, independent research, and electives in the area of interest. Students select faculty advisors and begin their independent dissertation research following laboratory rotations in the biomedical science core curriculum. The curriculum is designed to enable students, guided by their advisors, to develop the expertise that prepares them for a successful career in research and education.

Admissions:

To be admitted into the Ph.D. or Master of Science in Biomedical Sciences (MSBS) Program, applicants must earn a baccalaureate (or equivalent) from an accredited college or university and have a minimum overall GPA of 3.0 on a 4.0 scale. Typically, applicants will have an undergraduate major in Biology or a related discipline. For international applicants, an appropriate test of English language proficiency is required. Scores from The Test of English as a Foreign Language (TOEFL) are accepted and a minimum iBT score of 84, or pBT score of 550 is required. Scores from the International English Language Testing Service (IELTS) are also accepted and a minimum score of 6.5 is required. Please review Proof of English Language Proficiency for Graduate Students (https://www.utoledo.edu/graduate/international/english-language-proficiency.html) for more information. A foreign credential evaluation (https://www.utoledo.edu/graduate/admission/foreign-credentialing/) is

required for all applicants who have completed coursework or degrees at non-US institutions. A prior Masters degree is not required to enter the PhD program. At this time, all students accepted without provisions into the PhD in Biomedical Science Program, and maintaining good academic standing, will receive a full tuition scholarship, living stipend and health insurance.

Degrees Offered

- MSBS in Molecular Medicine
- Ph.D in Biomedical Science - Molecular Medicine

BMSP 5320 Statistical Methods I
[3 credit hours]
Introduction to statistical methods with emphasis on problems in the biomedical sciences. Included are descriptive statistics, probability theory, statistical inference, experimental design and simple statistical tests.
Term Offered: Summer

BMSP 6000 Entering Research
[1 credit hour]
This course is designed for novice graduate students to help them recognize the most critical training, relationships, and development in their graduate studies. Many of these students need to practice and implement the skills taught here throughout their graduate years. We are here to help facilitate student's career growth.
Term Offered: Fall

BMSP 6010 Strategic Approaches to Biomedical Research
[2 credit hours]
This course is designed to have doctoral students practice to become scientific leaders at an early stage of training. Scientific leaders constantly seek the most current knowledge in their research field to identify gaps in knowledge. They then generate a hypothesis to fill in knowledge gaps and Specific Aims to test the hypothesis. Scientific leaders communicate efficiently by giving presentations, publishing studies, writing proposals, and reviewing peers' work. In this course, students will develop skills to comprehend the current knowledge in a research area, identify the gap in knowledge, generate hypotheses and specific aims, and then design rigorous experimental approaches. Problem-based and active learning are used throughout this course to help students achieve higher order learning skills such as gathering data, and analyzing what is known, and then apply this knowledge to evaluate new concepts and create new research strategies.
Term Offered: Summer

BMSP 6340 Curr Prob Res App Genes/Genom
[2 credit hours]
This course provides an introduction to major areas of current research in genetics and molecular biology. Topics include gene structure and regulation, DNA replication, recombination, repair, mutation, and quantitative genetics.
Term Offered: Fall

BMSP 6350 Cell Biology & Signaling
[3 credit hours]
The content of this course will encompass didactic lectures on current knowledge and methodological approaches in the area of fundamental cellular processes and cell communication.
Term Offered: Spring

BMSP 6360 Current Problems and Research Approaches in Cell Membranes
[2 credit hours]
This course will explore vital roles played by plasma and intracellular membranes in communication and homeostasis, and by membrane lipid/protein interactions in defining cytoarchitecture, protein sorting, excitability and synaptic transmission.
Term Offered: Fall

BMSP 6370 Recent Advances in NND Journal
[1 credit hour]
Forum for the presentation,critique, and discussion of recent primary literature important to the development of the field of biomedical science.
Term Offered: Spring

BMSP 6380 Methods in Biomedical Sciences
[2 credit hours]
This course will cover the basic principles and applications, of state-of-the-art technology in molecular biology, protein chemistry, and studies with culture cells, tissue explants and transgenic animal models.
Term Offered: Fall

BMSP 6390 Mentored Research
[1-15 credit hours]
Students will be mentored in biomedical research and will gain familiarity with research projects ongoing in graduate laboratories. May be repeated for credit.
Term Offered: Spring, Summer, Fall

BMSP 6400 BPG Intro to Mthds in Bio Sci
[1 credit hour]
Introduction to biomedical methods. Required for Bioinformatics, Proteomics and Genomics (BPG) MSBS (but not certificate) students. An abbreviated version of BMSP 638, BMSP 640 runs for first 8 weeks of Fall semester.
Term Offered: Fall

BMSP 6470 System Pathophysiology
[4 credit hours]
This course provides an understanding of fundamental processes underlying pathophysiology, which occur at the cellular and organ level and lead to impairment of physiology processes. The course is organized into 6 blocks providing knowledge on the malfunctions of physiological systems, including cardiovascular, renal, skeletal, endocrinology, immunology, neural system, and cancer, and an introduction to pharmacology and applied bioinformatics.
Term Offered: Spring

BMSP 7320 Statistical Methods I
[3 credit hours]
Introduction to statistical methods with emphasis on problems in the biomedical sciences. Included are descriptive statistics, probability theory, statistical inference, experimental design and simple statistical tests.
Term Offered: Summer

BMSP 8240 Qualifying Exam to Fellowship
[1 credit hour]
This course is designed to guide predoctoral students through the process of converting their qualifying exam into a competitive fellowship application to NIH (F31), the American Heart Association, or other external funding agencies.
Term Offered: Spring

BMSP 8250 Grant Writing Workshop
[3 credit hours]
This standard letter-grade course is designed to guide predoctoral students through the process of converting their qualifying exam into a competitive fellowship application to the NIH (F31), the American Heart Association, or other external funding agency; submission of an application is required for course completion.
Term Offered: Spring

BMSP 8320 Systems Pathophysiology II
[2.5 credit hours]
The course will cover the fundamentals and current research efforts in biomedical sciences, emphasizing diseases of the cardiovascular, immune, and nervous systems, as well as metabolic and infectious diseases.
Term Offered: Spring

BMSP 8330 Curr Prob Res App Protein Str
[2.5 credit hours]
The course will cover principles of protein structure/function relationships in proteins, protein folding, ligand-protein interactions and mechanisms of enzyme-catalyzed reactions. Special emphasis will be given to the present-day research.
Term Offered: Fall

BMSP 8340 Curr Prob Res App Genes/Genome
[2 credit hours]
This course provides an introduction to major areas of current research in genetics and molecular biology. Topics include gene structure and regulation, DNA replication, recombination, repair, mutation, and quantitative genetics.
Term Offered: Fall

BMSP 8350 Cell Biology & Signaling
[3 credit hours]
The content of this course will encompass didactic lectures on current knowledge and methodological approaches in the area of fundamental cellular processes and cell communication.
Term Offered: Spring

BMSP 8360 Curr Prob Cell Membranes
[2.5 credit hours]
This course will explore vital roles played by plasma and intracellular membranes in communication and homeostasis, and by membrane lipid/protein interactions in defining cytoarchitecture, protein sorting, excitability and synaptic transmission.
Term Offered: Fall

BMSP 8380 Methods Biomedical Sciences
[2.5 credit hours]
This course will cover the basic principles and applications, of state-of-the-art technology in molecular biology, protein chemistry, and studies with culture cells, tissue explants and transgenic animal models.
Term Offered: Fall

BMSP 8390 Mentored Research
[1-15 credit hours]
Students will be mentored in biomedical research and will gain familiarity with research projects ongoing in graduate laboratories. May be repeated for credit.
Term Offered: Spring, Summer, Fall

BMSP 8470 System Pathophysiology
[4 credit hours]
This course provides an understanding of fundamental processes underlying pathophysiology, which occur at the cellular and organ level and lead to impairment of physiology processes. The course is organized into 6 blocks providing knowledge on the malfunctions of physiological systems, including cardiovascular, renal, skeletal, endocrinology, immunology, neural system, and cancer, and an introduction to pharmacology and applied bioinformatics.
Term Offered: Spring

Department of Radiology and Department of Radiation Oncology

Accreditations

The MSBS program in Medical Physics and the PhD in Physics and Astronomy with specialization in Medical Physics are accredited by the Commission on Accreditation of Medical Physics Educational Programs (www.campep.org (http://www.campep.org)).

Degrees Offered

- MSBS Medical Physics (Diagnostic Imaging Track) (p. 172)
- MSBS Medical Physics (Radiation Oncology Track) (p. 172)
- Also PhD in Physics and Astronomy with specialization in medical physics in both tracks is offered through the College of Natural Sciences & Mathematics.

MPHY 6010 Survey of Diagnostic Medical Imaging I
[3 credit hours]
This course provides a survey of diagnostic imaging modalities including the physical principles and instrumentation of diagnostic imaging equipment. Radiographic and fluoroscopic imaging systems, x-ray computed tomography, Ultrasound, MRI, and basic of Nuclear Medicine will be covered. The course builds upon basic review of atomic and nuclear properties, production of x-rays, and interaction or radiation with matter.
Term Offered: Fall

MPHY 6020 Survey of Diagnostic Medical Imaging II
[3 credit hours]
This course builds on the materials taught in MPHY 6010/8010, and discusses advanced concepts in medical imaging including functioning MRI, SPECT, and PET imaging. Details of radioactivity and nuclear transformation, radionuclide production and radiopharmaceutics, radiation detection and measurement and scintillation camera will be covered. Advanced discussions on CT and US will also be presented.
Term Offered: Spring

MPHY 6040 Diagnostic Radiological Physic
[0-5 credit hours]
This course considers the physical principles and instrumentation of diagnostic image formation including radiography, fluoroscopy, computed tomography, ultrasound, nuclear medicine and magnetic resonance imaging.
Term Offered: Spring, Fall

MPHY 6060 Nuclear Medicine
[3 credit hours]
Course covers the physical aspects of diagnostic and therapeutic applications of radionuclides. This includes radiation detectors and imaging systems, emission tomography, counting statistics, equipment testing, radiopharmaceuticals and internal radiation dosimetry.
Term Offered: Summer, Fall

MPHY 6100 Clinical Imaging Review
[0-4 credit hours]
Review of the clinical aspect of diagnostic imaging of clinical modalities and anatomy as approved by instructor. Review typically will include reading, discussion, and clinical image review covering radiological anatomy, physiology, disease states, and considerations for diagnostic interpretation of images. May be repeated for credit.
Term Offered: Summer

MPHY 6110 Survey Clinical Radi Therapy
[2 credit hours]
A series of lectures on various topics in radiation therapy give an overview of radiation therapy in the clinical care of patients and familiarize students with a variety of options for treatment of cancer patients.
Term Offered: Spring, Fall

MPHY 6120 Radiation Dosimetry I
[3 credit hours]
Series of lectures covering basic concepts of radiation physics, interactions of ionizing radiation physics, interactions of ionizing radiation with matter, and fundamentals of radiation dosimetry techniques and instrumentation. An overview of principles of radiation therapy, radiation protection, nuclear medicine, and diagnostic radiology is given.
Term Offered: Fall

MPHY 6130 Radiation Dosimetry II
[3 credit hours]
Series of lectures covering interactions of ionizing radiation with matter and radiation dosimetry physics fundamentals in-depth. Cavity theories, integrating and pulse-mode dosimeters, dosimetry and calibration of photon and electron beams, and neutron dosimetry are considered in details.
Term Offered: Spring

MPHY 6160 Radiation Biology
[3 credit hours]
A series of introductory lectures on radiation biology with emphasis on the effects of radiation on cells and cellular components, tissues, and organisms. Dose-response relationships, dose-effect modifiers, and considerations applicable to radiation therapy treatments are among covered topics.
Term Offered: Spring

MPHY 6180 Physics of Radiation Therapy
[3 credit hours]
Series of lectures covering physics in radiation therapy. The calculations and measurements necessary to determine the radiation dose distribution in patients receiving radiotherapy will be presented. Newer treatment modalities, e.g., heavy ion and flash therapy, will be discussed.
Term Offered: Spring, Summer, Fall

MPHY 6190 Brachytherapy
[3 credit hours]
Fundamental information about the physical characteristics of the sources used in brachytherapy, the methods used for implant planning and evaluation of plans.
Term Offered: Summer

MPHY 6200 Radiatn Protect and Regulation
[3 credit hours]
Course considers the hazards associated with radioactivity and electromagnetic radiation, including types and sources of radiation, radiation measurement and units, dosimetry, radiation protection practices required by governmental regulation and medical facility accrediting bodies.
Term Offered: Summer

MPHY 6240 Physics of Medicine and Biol
[3 credit hours]
Overview of physics as applied to physiological and biological systems, including body mechanics, osmosis, respiratory and cardiovascular mechanisms, electric signals, speech, hearing, and sight.
Term Offered: Spring

MPHY 6260 Computers in Medical Physics
[2 credit hours]
Computer fundamentals to introduce students to the internal functions of computers and the system architectures and how they are used in the clinical environment as it relates to Medical Physics.
Term Offered: Spring

MPHY 6280 Electronics for Med Physicists
[2 credit hours]
Basics of electronics circuit design to perform specific tasks as it relates to medical physics applications.

MPHY 6300 Radiation Detection/Measuremen
[3 credit hours]
Introduces the student to the various equipment and methods used in radiation detection and measurement. Introduces advanced concepts in error analysis, energy spectra unfolding, fit results with function, etc. The lab portion of this course, PHYS6180, is taught through the University of Toledo.
Term Offered: Spring

MPHY 6310 Anatomy/Physiology
[4 credit hours]
The course will cover an overview of physiology at a cellular, and organ system levels. This will include normal function of human body and some clinical manifestations of human diseases. There will also be some introduction to basic skeletal system.
Term Offered: Fall

MPHY 6320 Practical Measurements in Radiation Therapy
[2 credit hours]
Series of practical labs covering quality assurance (QA) in radiation therapy. The calculations and measurements are performed during the lab. The rationale of each quality control test will be discussed. The scientific lab reports are generated and marked follow each lab.
Term Offered: Summer

MPHY 6400 Intro to LINAC in Radiation Th
[3 credit hours]
The electron linear accelerator will be described in theory and operation as it relates to medical physics and cancer patients. The physics aspect of particle acceleration and x-ray and electron generation using these units as well as dose delivery to the patient is considered.

MPHY 6500 Medical Physics Seminar
[1 credit hour]
Recent developments, special topics, critical analysis of recent publications, and literature reviews in specific areas of medical physics. May be repeated for credit.
Term Offered: Spring, Fall

MPHY 6520 Radiation Safety and Measremnt
[3 credit hours]
Review of fundamentals of radiation safety and protection, instrumentation, radioactivity, radiation interaction with matter, and biological effects of radiation. Also, measurement methods, safety practices and regulations for use of radiation in research and medicine is presented.

MPHY 6610 Clin Trng Radi Oncol Physics I
[4 credit hours]
This course offers clinical training in radiation oncology physics to graduate students. This will include clinical dosimetry concepts, anatomy & physiology, clinical radiobiology, and overview of special procedures including SRS, SBRT, IORT, HDR, LDR, Rad Safety and Regulations. QA of equipment and clinical responsibilities; review of TG 142, 51, 66 and other related reports.
Term Offered: Fall

MPHY 6620 Clin Trng Radi Oncol Physcs II
[4 credit hours]
This course offers advanced clinical training in radiation oncology physics to senior level graduate students. Advanced dosimetry concepts, Brachytherapy, IMRT, IGRT, adaptive IGRT. Other special procedures are covered. Also, lectures and hands-on training are provided so that students can fine Tone their techniques in Treatment Planning, QA Issues, daily clinical responsibilities and operation as a medical physicist are taught.
Term Offered: Spring, Summer, Fall

MPHY 6630 Clin Trng Radi Oncol Physc III
[5 credit hours]
Clinical training in radiation therapy physics to graduate students who have obtained an MS or Ph.D. degree in the field of medical physics or related area. May be repeated for credit
Term Offered: Summer

MPHY 6730 Medical Physics Research
[0-4 credit hours]
Students will participate in selected ongoing research programs of members of the department faculty. May be repeated for credit.
Term Offered: Summer

MPHY 6840 Independent Study: Med Physics
[0-12 credit hours]
Combination of reading, lecture and discussion within a defined area of medical physics. Defined topics are: dosimetry, internal dosimetry, radiobiology, monte carlo analysis, image processing, topical study. May be repeated for credit.
Term Offered: Spring, Summer, Fall

MPHY 6860 Independent Study in Radiology
[0-12 credit hours]
Combination of reading, lecture and discussion within a defined area of radiology. Defined topics are: radiographic imaging, computed tomography, magnetic resonance imaging, nuclear medicine, diagnostic ultrasound, diagnostic quality control, digital imaging. May be repeated for credit.
Term Offered: Spring, Summer, Fall

MPHY 6880 Independent Study: Rad Therapy
[0-12 credit hours]
Combination of reading, lecture, and discussion within a defined area of radiation therapy. Defined topics are: 3-D conformal treatment planning, 3-D dose compensators, stereotactic radiosurgery, electron arc therapy, photon and electron algorithms, treatment planning dosimetry verification, total body irradiation, total body skin. May be repeated for credit.

MPHY 8010 Survey of Diagnostic Medical Imaging I
[3 credit hours]
This course provides a survey of diagnostic imaging modalities including the physical principles and instrumentation of diagnostic imaging equipment. Radiographic and fluoroscopic imaging systems, x-ray computed tomography, Ultrasound, MRI, and basic of Nuclear Medicine will be covered. The course builds upon basic review of atomic and nuclear properties, production of x-rays, and interaction or radiation with matter.
Term Offered: Fall

MPHY 8020 Survey of Diagnostic Medical Imaging II
[3 credit hours]
This course builds on the materials taught in MPHY 6010/8010, and discusses advanced concepts in medical imaging including functioning MRI, SPECT, and PET imaging. Details of radioactivity and nuclear transformation, radionuclide production and radiopharmaceutics, radiation detection and measurement and scintillation camera will be covered. Advanced discussions on CT and US will also be presented.
Term Offered: Spring

MPHY 8040 Diag Radiological Physics
[0-5 credit hours]
This course considers the physical principles and instrumentation of diagnostic image formation including radiography, fluoroscopy, computed tomography, ultrasound, nuclear medicine and magnetic resonance imaging.
Term Offered: Spring, Fall

MPHY 8060 Nuclear Medicine
[3 credit hours]
Course covers the physical aspects of diagnostic and therapeutic applications of radionuclides. This includes radiation detectors and imaging systems, emission tomography, counting statistics, equipment testing, radiopharmaceuticals and internal radiation dosimetry.
Term Offered: Fall

MPHY 8110 Survey Clinical Radi Therapy
[2 credit hours]
A series of lectures on various topics in radiation therapy give an overview of radiation therapy in the clinical care of patients and familiarize students with a variety of options for treatment of cancer patients.
Term Offered: Spring, Fall

MPHY 8120 Radiation Dosimetry I
[3 credit hours]
Series of lectures covering basic concepts of radiation physics, interactions of ionizing radiation physics, interactions of ionizing radiation with matter, and fundamentals of radiation dosimetry techniques and instrumentation. An overview of principles of radiation therapy, radiation protection, nuclear medicine, and diagnostic radiology is given.
Term Offered: Fall

MPHY 8130 Radiation Dosimetry II
[3 credit hours]
Series of lectures covering interactions of ionizing radiation with matter and radiation dosimetry physics fundamentals in-depth. Cavity theories, integrating and pulse-mode dosimeters, dosimetry and calibration of photon and electron beams, and neutron dosimetry are considered in details.
Term Offered: Spring

MPHY 8160 Radiation Biology
[3 credit hours]
A series of introductory lectures on radiation biology with emphasis on the effects of radiation on cells and cellular components, tissues, and organisms. Dose-response relationships, dose-effect modifiers, and considerations applicable to radiation therapy treatments are among covered topics.
Term Offered: Spring

MPHY 8180 Physics of Radiation Therapy
[3 credit hours]
Series of lectures covering physics in radiation therapy. The calculations and measurements necessary to determine the radiation dose distribution in patients receiving radiotherapy will be presented. Newer treatment modalities, e.g., heavy ion and flash therapy, will be discussed.
Term Offered: Spring, Summer, Fall

MPHY 8190 Brachytherapy
[3 credit hours]
Fundamental information about the physical characteristics of the sources used in brachytherapy, the methods used for implant planning and evaluation of plans.
Term Offered: Summer

MPHY 8200 Radiatn Protect and Regulation
[3 credit hours]
Course considers the hazards associated with radioactivity and electromagnetic radiation, including types and sources of radiation, radiation measurement and units, dosimetry, radiation protection practices required by governmental regulation and medical facility accrediting bodies.
Term Offered: Summer

MPHY 8240 Physics of Medicine and Biol
[3 credit hours]
Overview of physics as applied to physiological and biological systems, including body mechanics, osmosis, respiratory and cardiovascular mechanisms, electric signals, speech, hearing, and sight.

MPHY 8260 Computer in Radiation Therapy
[2 credit hours]
Computer fundamentals and problem solving through programming. Typical problems include PDD, TAR, TMR, MU calculations, scatter summation, TMR for arc and dose distributions.

MPHY 8280 Electronics for Med Physicists
[2 credit hours]
Basics of electronics circuit design to perform specific tasks as it relates to medical physics applications.

MPHY 8300 Radiation Detection/Measuremen
[3 credit hours]
Introduces the student to the various equipment and methods used in radiation detection and measurement. Introduces advanced concepts in error analysis, energy spectra unfolding, fit results with function, etc. The lab portion of this course, PHYS6180, is taught through the University of Toledo.
Term Offered: Spring

MPHY 8310 Anatomy & Physiology
[4 credit hours]
The course will cover an overview of physiology at a cellular, and organ system levels. This will include normal function of human body and some clinical manifestations of human diseases. There will also be some introduction to basic skeletal system.
Term Offered: Fall

MPHY 8320 Practical Measurements in Rad
[2 credit hours]
Basic practical considerations in measurements of photon and electron beam parameters of the linear accelerator.
Term Offered: Summer

MPHY 8400 Intro to LINAC in Radiation Th
[3 credit hours]
The electron linear accelerator will be described in theory and operation as it relates to medical physics and cancer patients. The physics aspect of particle acceleration and x-ray and electron generation using these units as well as dose delivery to the patient is considered.

MPHY 8500 Medical Physics Seminar
[1 credit hour]
Recent developments, special topics, critical analysis of recent publications, and literature reviews in specific areas of medical physics. May be repeated for credit.
Term Offered: Spring, Fall

MPHY 8520 Radiation Safety and Measremnt
[3 credit hours]
Review of fundamentals of radiation safety and protection, instrumentation, radioactivity, radiation interaction with matter, and biological effects of radiation. Also, measurement methods, safety practices and regulations for use of radiation in research and medicine is presented.

MPHY 8610 Clin Trng Radi Oncol Physics I
[4 credit hours]
This course offers clinical training in radiation oncology physics to graduate students. This will include clinical dosimetry concepts, anatomy & physiology, clinical radiobiology, and overview of special procedures including SRS, SBRT, IORT, HDR, LDR, Rad Safety and Regulations. QA of equipment and clinical responsibilities; review of TG 142, 51, 66 and other related reports.
Term Offered: Fall

MPHY 8620 Clin Trng Radi Oncol Physcs II
[4 credit hours]
This course offers advanced clinical training in radiation oncology physics to senior level graduate students. Advanced dosimetry concepts, Brachytherapy, IMRT, IGRT, adaptive IGRT, other special procedures are covered. Also, lectures and hands-on training are provided so that students can fine tone their techniques in Treatment Planning, QA Issues, daily clinical responsibilities and operations as a medical physicist are taught.
Term Offered: Spring

MPHY 8630 Clin Trng Radi Oncol Physc III
[5 credit hours]
Clinical training in radiation therapy physics to graduate students who have obtained an MS or Ph.D. degree in the field of medical physics or related area. May be repeated for credit
Term Offered: Summer

MPHY 8730 Medical Physics Research
[0-4 credit hours]
Students will participate in selected ongoing research programs of members of the department faculty. May be repeated for credit.

MPHY 8840 Independent Study: Med Physics
[0-12 credit hours]
Combination of reading, lecture and discussion within a defined area of medical physics. Defined topics are: dosimetry, internal dosimetry, radiobiology, monte carlo analysis, image processing, topical study. May be repeated for credit.
Term Offered: Summer, Fall

MPHY 8860 Independent Study in Radiology
[0-12 credit hours]
Combination of reading, lecture and discussion within a defined area of radiology. Defined topics are: radiographic imaging, computed tomography, magnetic resonance imaging, nuclear medicine, diagnostic ultrasound, diagnostic quality control, digital imaging. May be repeated for credit.

MPHY 8880 Independent Study: Rad Therapy
[0-12 credit hours]
Combination of reading, lecture, and discussion within a defined area of radiation therapy. Defined topics are: 3-D conformal treatment planning, 3-D dose compensators, stereotactic radiosurgery, electron arc therapy, photon and electron algorithms, treatment planning dosimetry verification, total body irradiation, total body skin. May be repeated for credit.

MPHY 8960 Dissertation Research
[0-15 credit hours]
Disciplinary or interdisciplinary investigation of significant problems at the doctoral level leading to the preparation of a scientific project for presentation as a dissertation.
Term Offered: Spring, Summer, Fall

Department of Urology

Housed in the Department of Urology, the Masters in Transplantation and Donation Sciences, Professional Science Master's degree (MSBS TaDS, PSM) program is the only academic program in the country designed to provide professional preparation for individuals who wish to become an organ Procurement Transplant Coordinator (PTC). PTCs facilitate the entire organ donation process from beginning to end, serving as liaisons between the donor's family, the coroner/medical examiner, the medical and nursing staff, the organ procurement organization (OPO), and all other involved entities. As a result, coordinators must skillfully and diplomatically deal with a number of issues, agendas, and personalities in order to achieve a successful organ transplant.

Combining core science coursework with business and management electives further enables the MSBS TaDS, PSM graduate to step into the professional world of organ and tissue donation and be more prepared to obtain leadership positions within their OPO.

Entrance requirements/prerequisites:

- Baccalaureate degree from a nationally accredited college or university.
- Overall grade point average of 3.0 in undergraduate coursework.
- Submission of online University of Toledo Graduate School Application including resume, personal statement, and payment of application fee.
- Three letters of recommendations
- A minimum of two semesters of coursework in the biological sciences, a minimum of two semesters of coursework in chemistry, and one semester of college algebra or higher-level math, with course grades of B or above.
- Satisfactory completion of a course in medical terminology and/or pass a medical terminology proficiency examination. Candidates who are unable to pass the initial medical terminology proficiency examination will be required to participate in a self- study program and take a re-test.
- The Graduate Record Examination (GRE) and TOEFL may be required for international students. Please review Proof of English Language Proficiency for Graduate Students (https://www.utoledo.edu/graduate/international/english-language-proficiency.html) for more information.
- A foreign credential evaluation (https://www.utoledo.edu/graduate/admission/foreign-credentialing/) is required for all applicants who have completed coursework or degrees at non-US institutions.
- Interview with the TaDS program Director, if requested.

Although not required, shadowing an organ procurement coordinator is highly recommended.

Persons who are currently practicing professionals working for an OPO are eligible to apply for this program and complete curriculum entirely on-line through the distance learning track. All other applicants who meet the above entrance requirements are eligible for the in person, on campus track.

- Biomedical Science: Transplantation and Donation Sciences (p. 171)

Division of Dentistry

Michael Nedley, D.D.S., chair

Degrees Offered

Oral Biology (p. 176)

DENT 6010 Growth and Development
[0.5 credit hours]
Presentation and discussion of key growth and development concepts related to orthodontic/orthopedic diagnosis and treatment in pediatric dentistry including: Orthodontic Records, Growth and Development of the Face and Dental Arches, Cephalometrics and Facial Esthetics, Orthodontic Diagnosis and Treatment in the Mixed Dentition, Management of the Developing Occlusion, Case Selection.
Term Offered: Fall

DENT 6020 Pharmacology 1
[0.5 credit hours]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, efxpected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Summer, Fall

DENT 6030 Dento-Alveolar Trauma I
[0.5 credit hours]

DENT 6040 Conscious Sedation I
[2 credit hours]
In depth discussion of the principles and objectives of conscious sedation, deep sedation and general anesthesia as behavior management techniques, including indications and contraindications for their use.
Term Offered: Summer, Fall

DENT 6050 Clinical Pediatric Dentistry
[0.5-1 credit hours]
In depth analysis of the scientific principles underlying the contemporary practice of pediatric dentistry, including the prevention of disease, dental anomalies, habits and other problems in occlusal development, and CAN.
Term Offered: Spring, Summer, Fall

DENT 6060 Principles of Behav/Comm Mgmt
[2 credit hours]
Critical analysis of historical behavior management and communication techniques and currently accepted behavior management techniques and utilization of techniques based upon patient age, cognitive development, behavior, medical history, parental concerns, and patient response to management techniques.
Term Offered: Summer, Fall

DENT 6070 Pediatric Dentistry Literature
[0.5 credit hours]
Presentation and discussion of selected articles related to the field of pediatric dentistry and other health related topics.
Term Offered: Spring, Summer, Fall

DENT 6080 Anatomy & Embryology Head/Neck
[1 credit hour]
Lecture and discussion of select topics in gross anatomy and embryology.
Term Offered: Spring

DENT 6090 Concepts - Dental Microbiology
[0.5 credit hours]

DENT 6100 Pediatric Medicine Lecture
[2 credit hours]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, efxpected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Spring, Summer, Fall

DENT 6110 Oral Health Policies
[2 credit hours]

DENT 6120 Pharmacology II
[0.5 credit hours]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, efxpected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Spring

DENT 6130 Dento-alveolar Trauma II
[0.5 credit hours]

DENT 6140 Conscious Sedation II
[2 credit hours]
In depth discussion of the principles and objectives of conscious sedation, deep sedation and general anesthesia as behavior management techniques, including indications and contraindications for their use.
Term Offered: Spring, Summer

DENT 6150 Amer Board of Pediaric Dent RE
[2 credit hours]

DENT 6160 Special Care Dentistry
[1 credit hour]
In depth discussion of medical and handicapping conditions that require modifications in the delivery of dental services to infants, children and adolescents. Topics to be covered include, but are not limited to: bleeding disorders, cardiovascular disease, complications of chemotherapy and radiation therapy, diabetes, developmental disabilities, hemaglobinopathies, hematopoetic cell transplantation, hematologic malignancies, infectious diseases, neurologic disorders, organ transplantation, respiratory diseases, sensory impairments, solid tumors, common pediatric syndromes.
Term Offered: Fall

DENT 6170 Clinical Pediatric Dent Clinic
[1-10 credit hours]
Observation and participation in the care of patients with preventive, restorative, surgical, orthodontic and prosthetic care within the Dentistry Clinic.
Term Offered: Spring, Summer, Fall

DENT 6200 Oral Pathology
[1 credit hour]
In depth discussion of the epidemiology, pathogenesis, clinical characteristics, diagnostic methods, formulation of differential diagnoses, and management of oral and perioral lesions and anomalies with emphasis on the infant child and adolescent.
Term Offered: Spring, Summer

DENT 6210 Endodontics
[0-2 credit hours]
Presentation and discussion of key elements of endodontics. The course will discuss: the pathology of dental pulp and periapical diseases, how to diagnosis and treatment plan for endodontic procedures. Isolation methods, endodontic access and length determination with proper x-ray methods will be discussed. Materials and Armamentarium will be considered for preparing, obturation, temporization and completion of the endodontic procedures.
Term Offered: Spring, Summer, Fall

DENT 6220 Operative Dentistry
[0-2 credit hours]
Presentation and discussion of key elements of Art and Science of operative dentistry related to dental material and tooth preparation. The course will discuss the clinical significance of Dental Anatomy, Histology, Physiology and occlusion. The materials to be examined will include amalgam restoration, composite restoration and cast metal and porcelain type restorations.
Term Offered: Spring, Summer, Fall

DENT 6230 Dental Occlusion
[0-2 credit hours]
Presentation and discussion of key elements of dental occlusion related to muscles of mastication, the TMJ and jaw relations including centric and protrusive positions. With various interocclusal records, stone models will be mounted on an articulator using a face bow to duplicate Jaw relation and the occlusal position of the subject patient. Then equilibrate the models into a centric relation.
Term Offered: Spring, Summer, Fall

DENT 6240 Dentures
[0-2 credit hours]
Presentation and discussion of key elements of the principles partial and complete dentures fabrication. Areas of concentration will be proper evaluation of the patients' needs and wants, comprehensive diagnosis, making impressions, recording the inter maxillary/mandibular space, neutral zone, initial tooth, the dress rehearsal, and delivery plus follow up equilibration. Developing expertise in finding centric and protrusive positions and mounting models on an articulator using a face bow.
Term Offered: Spring, Summer, Fall

DENT 6250 General Dentistry Literature Review
[2 credit hours]
Presentation and discussion of selected articles related to the field of General Dentistry and other health related fields.
Term Offered: Spring, Summer, Fall

DENT 6260 Clinical General Dentistry Dental Clinic
[2 credit hours]
The General Practice Resident will participate in the direct care of dentistry patients in the outpatient dental facility in the UTMC or Toledo Hospital dental clinic.
Term Offered: Spring, Summer, Fall

College of Natural Sciences and Mathematics

Graduate Catalog 2026-2027

COLLEGE MISSION

We improve the human condition by providing our students with a world-class education, fostering research and discovery, engaging with our community, and advancing science, mathematics, and technology. Through this, we are preparing students for a rich and rewarding career in an increasingly complex and changing world.

OFFICE OF THE DEAN

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Ph.D. in Molecular Biology, Loyola University-Chicago/Stritch School of Medicine

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Email: rita.yunker@utoledo.edu

Graduate Degrees/Certificates Offered

- MS in Biology (p. 230) (Cell and Molecular Biology Concentration)
- PhD in Biology (p. 232) (Cell and Molecular Biology Concentration)
- MS in Chemistry (p. 204)
- MS Chemistry - Green Chemistry and Engineering Concentration (p. 204)
- PhD in Chemistry (p. 206)
- MS in Environmental Science (p. 211)
- PhD in Environmental Science (p. 213)
- MS in Biology ((p. 211)Ecology and Organismal Biology Concentration)
- PhD in Biology ((p. 212)Ecology and Organismal Biology Concentration)
- MS in Mathematics (p. 224)
- PhD in Mathematics (p. 226)
- MS in Physics (p. 238)
- MS in Physics - (p. 239)Photovoltaics Concentration
- PhD in Physics (p. 240)
- MS in Data Science and AI (https://catalog.utoledo.edu/graduate/natural-sciences-mathematics/departments/school-of-interdisciplinary-data-science/data-science-and-ai-master-of-science/)
- Hydrogeology and Groundwater Modeling, Graduate Certificate (p. 210)
- Materials Science, Graduate Certificate (p. 237)
- Photovoltaics, Graduate Certificate (p. 237)

College Policies (Graduate Handbook)

CHEMISTRY AND BIOCHEMISTRY GRADUATE HANDBOOK

ENVIRONMENTAL SCIENCES GRADUATE HANDBOOK

MATHEMATICS AND STATISTICS GRADUATE HANDBOOK (http://www.math.utoledo.edu/guide.html) (http://www.utoledo.edu/nsm/envsciences/students/pdfs/DES%20Graduate%20Student%20Handbook%202018.pdf)

MOLECULAR, CELLULAR, AND DEVELOPMENTAL BIOLOGY (https://www.utoledo.edu/nsm/bio/pdfs/BGSA%20Handbook%202017-18%20JO%202017%2008%2001_website.pdf)

PHYSICS AND ASTRONOMY GRADUATE HANDBOOK (https://www.utoledo.edu/nsm/physast/pdfs/PhysAstroGradHandbook.pdf) (http://www.utoledo.edu/nsm/envsciences/students/pdfs/DES%20Graduate%20Student%20Handbook%202018.pdf)

College Of Graduate Studies

- College of Graduate Studies (p. 407)
- College Policies and Procedures and Handbook (p. 407)
- Academic Regulations (p. 412)
- Graduate Academic Policies (https://www.utoledo.edu/policies/academic/graduate/)

Departments/School

- Department of Chemistry and Biochemistry (p. 198)
- Department of Environmental Sciences (p. 207)
- Department of Mathematics and Statistics (p. 216)
- Department of Molecular, Cellular and Developmental Biology (p. 228)
- Department of Physics and Astronomy (p. 233)
- School of Interdisciplinary Data Science (https://catalog.utoledo.edu/graduate/natural-sciences-mathematics/departments/school-of-interdisciplinary-data-science/)

Department of Chemistry and Biochemistry

Steven Sucheck, chair
Wei Li, associate chair
Peter Andreana, director of graduate studies

Mission

*The **mission** of the Department of Chemistry and Biochemistry is (1) to present outstanding teaching and the highest quality education in chemistry to students at all levels and in all disciplines, (2) to develop and maintain leading research programs with national and international reputations, both in support of our teaching programs and to add to the scientific and technological base of the State of Ohio and the Nation, (3) to advance the development of teaching and research qualifications of the Faculty, (4) to improve our already active and high quality graduate programs with emphasis in biochemistry and materials science, and (5) to serve the University, the Community, and Society through the unique experiences and talents found in the department. Our day-to-day and our long-term activities are guided by the mission.*

The Department of Chemistry and Biochemistry is a comprehensive chemistry program offering MS (both thesis and non-thesis options) and PhD degrees in chemistry.

Degrees Offered

- MS in Chemistry (p. 204)
- MS Chemistry - Green Chemistry and Engineering Concentration (p. 204)
- PhD in Chemistry (p. 206)
- Green Chemistry and Engineering, Graduate Certificate (p. 203)

CHEM 5230 Chemistry of Sustainable Materials
[4 credit hours]
Applications of the principles of chemistry to understand the issues related to a sustainable energy future.

CHEM 6200 Green Chemistry
[3 credit hours]
Advanced topics in green chemistry, including industrial applications, atom economy, safer solvent substitutions, alternatives assessment, green metrics (PMI, E-factor), basic life cycle analysis, and an introduction to chemical toxicology.
Term Offered: Fall

CHEM 6210 Environmental Chemistry
[3 credit hours]
This course will focus on the chemistry of air, water, and soil with specific emphasis on the effects of human-made chemical products and by-products on the environment. Connections with green chemistry will be highlighted.
Term Offered: Spring

CHEM 6300 Advanced Analytical Chemistry
[4 credit hours]
An overview of new techniques in analytical chemistry. Topics include sample preparation and sampling, spectroscopic, separation, electrochemical, surface characterization and thermal methods. Prerequisite: Permission of department.
Term Offered: Fall

CHEM 6310 Separation Methods
[3 credit hours]
The theory, design and application of separation methods. Topics include extraction techniques, gas, liquid, and supercritical fluid chromatography, affinity and chiral separation, and capillary electrophoresis.
Term Offered: Spring

CHEM 6320 Electrochemistry
[4 credit hours]
A fundamental study of electrochemical concepts, methods, instrumentation and applications. Prerequisite: Permission of department.
Term Offered: Spring

CHEM 6330 Spectroscopic Methods And Analysis Of Spectra
[4 credit hours]
A comprehensive study of theory and instrumentation. Applications of spectroscopic methods including spectral interpretation. Topics include a study of absorption, emission, Raman, NMR, ESR, mass spectrometry, and related subjects. Important methodology and strategy in organic synthesis including disconnection and retrosynthetic analysis.
Term Offered: Spring

CHEM 6340 Mass Spectrometry
[4 credit hours]
The principles and applications of mass spectrometry in chemistry, biochemistry, and related disciplines. Prerequisite: Admitted to the graduate program.

CHEM 6350 Separation Methods Laboratory
[1 credit hour]
Experiments covering topics discussed in CHEM 6310 lectures. Five hours of laboratory per week. Approved chemical safety goggles meeting the American National Standard 287.1-1968 must be worn by every student during every laboratory class meeting.
Corequisites: CHEM 6310
Term Offered: Spring

CHEM 6400 Advanced Organic Chemistry
[4 credit hours]
This course deals with chemical structure and reactivity correlations applied to the study of organic reaction mechanisms; stereochemical features including conformation and stereoelectronic effects; reaction dynamics, isotope effects and molecular orbital theory applied to pericyclic and photochemical reactions; and special reactive intermediates including carbenes, carbanions, and free radicals.
Term Offered: Fall

CHEM 6410 Organic Synthesis
[4 credit hours]
Important methodology and strategy in organic synthesis including disconnection and retrosynthetic analysis.
Term Offered: Spring

CHEM 6430 Medicinal Chemistry
[4 credit hours]
Qualitative and quantitative aspects of the design of new therapeutic agents are discussed. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids will be examined.
Term Offered: Fall

CHEM 6440 Carbohydrate Chemistry
[4 credit hours]
Topics in carbohydrate chemistry, including chemical synthesis of complex oligosaccharides, complex glycoconjugates (glycolipids, glycopeptides, and glycoproteins).
Term Offered: Fall

CHEM 6450 Organic Reaction Mechanisms
[3 credit hours]
This course focuses on a thorough treatment of synthetic chemistry through so-called Named Reactions, as well as extensive study of the underlying mechanisms. Course is often conducted as a "flipped classroom", and will require viewing pre-recorded lectures outside of the scheduled class time to allow in class time to focus on practical applications of course material.
Term Offered: Fall

CHEM 6500 Advanced Biological Chemistry
[4 credit hours]
The chemistry of cellular and molecular transformations in biochemical systems. Molecular structure of proteins, nucleic acids and membranes. Metabolism and biosynthesis of carbohydrates, amino acids and lipids; gene regulation and replication.
Term Offered: Fall

CHEM 6510 Protein Chemistry
[4 credit hours]
A detailed analysis of the structure and function of proteins. Current methodology for the analysis of structure, the basis for molecular associations and relationships between structure and biological function.
Prerequisites: CHEM 6500 with a minimum grade of D-
Term Offered: Spring

CHEM 6520 Enzymology
[4 credit hours]
Survey of current methods to study enzyme-catalyzed reactions, and application to examples from major enzyme, groups. Current topics in enzymology include abzymes and ribozymes, artificial enzymes, and enzymes, and enzyme engineering.
Term Offered: Spring

CHEM 6570 Biophysical Chemistry
[4 credit hours]
Principles and applications of physical chemistry as applied to biological macromolecules (i.e., proteins and nucleic acids in solution), including thermodynamics, kinetics and spectroscopy of macromolecular interactions.
Prerequisites: (PHYS 2080 with a minimum grade of C- or PHYS 2140 with a minimum grade of C-) and CHEM 3520 with a minimum grade of C-
Term Offered: Fall

CHEM 6600 Physical Inorganic Chemistry
[4 credit hours]
Symmetry, bonding theories, magnetism, and spectroscopic characterization of inorganic compounds are described. Coverage of spectroscopic techniques such as NMR, EPR, UV/VIS, IR, AND Mossbauer focus on applications to inorganic systems.
Term Offered: Fall

CHEM 6610 Chemistry of Transition and Post-Transition Elements
[4 credit hours]
The organometallic chemistry of the transition metals, lanthanides and actinides is described. Synthesis, structure, bonding, and reactivity are considered. Applications in catalysis, bioinorganic, and materials chlemistry are discussed.
Term Offered: Fall

CHEM 6620 Chemistry of the Main Group Elements
[4 credit hours]
The inorganic and organomethallic chemistry of main group elements is described. Synthesis, structure, bonding, and reactivity are considered. The use of main group reagents in synthesis, catalysis, and materials chemistry are discussed.
Term Offered: Spring

CHEM 6710 Quantum Chemistry and Spectroscopy
[4 credit hours]
Fundamental principles of quantum mechanics and their application to model systems, atoms and molecules; Introduction to molecular spectroscopy.
Term Offered: Spring

CHEM 6720 Modern Topics in Physical Chemistry
[4 credit hours]
Advanced topics of current interest is physical chemistry. Examples of topics include nanomaterials science, spectroscopic techniques, or molecular modeling.
Term Offered: Spring, Fall

CHEM 6730 Molecular Modeling
[4 credit hours]
Theory and techniques of contemporary molecular modeling, and their application to calculate physical and chemical properties of realistic molecular systems.
Term Offered: Spring, Fall

CHEM 6800 Advanced Materials Chemistry
[4 credit hours]
Introduction to important classes of solids, including conductors, magnetic materials, ferroelectrics, glasses, microporous materials, organic solids. Traditional and novel synthetic approaches, structure/property relationships, and characterization methods specific to solids.
Prerequisites: CHEM 3740 with a minimum grade of C or PHYS 3310 with a minimum grade of C or PHYS 4630 with a minimum grade of C
Term Offered: Spring

CHEM 6810 Materials Science I
[4 credit hours]
A generic materials science approach to the study of crystalline structure and defects (point, line and planar) in crystalline materials. The mechanisms and kinetics of diffusion in the condensed state.
Term Offered: Fall

CHEM 6820 Materials Science II
[4 credit hours]
A materials science approach to the thermodynamics of condensed state equilibria. Phase transformation kinetics.
Term Offered: Spring

CHEM 6830 Nanomaterials Science
[4 credit hours]
This survey course is intended to serve as an introduction to nanotechnology for non-specialists. It is accessible to students in any technical major, including chemists (all divisions), physicists, and engineers. The fundamentals of nanotechnology will be covered, including the origin of nanoscale properties, synthesis and characterization of nanomaterials (e.g. colloids, nanoparticles, nanowires, nanotubes, DNA-based structures), fabrication of larger-scale structures (e.g. self assembly, lithography), and characterization techniques (e.g. microscopy, microanalysis, spectroscopy). Applications will also be discussed.
Term Offered: Spring, Fall

CHEM 6850 X-Ray Crystallography
[4 credit hours]
Theory and practice of structure determination by X-ray diffraction. Basics of symmetry, diffraction, and reciprocal space. Hands-on introduction to single-crystal and powder methods.
Term Offered: Fall

CHEM 6920 Chemistry Colloquium
[0-1 credit hours]
Presentations on research or current literature.
Term Offered: Spring, Summer, Fall

CHEM 6930 Chemistry Seminar
[0-1 credit hours]
Seminars conducted by individual members of the Department.
Term Offered: Spring, Fall

CHEM 6940 Scientific Communication 1
[1 credit hour]
Instruction on different modes of scientific communication focused on written communication, online resources, and scientific ethics. Tools to enable students to think and converse competently in the language of science.
Term Offered: Fall

CHEM 6950 Scientific Communication 2
[1 credit hour]
Instruction on different modes of scientific communication: written communication, oral presentation, and research proposals, to enable students to think and converse competently in the language of science.
Term Offered: Fall

CHEM 6960 Thesis Research
[1-15 credit hours]
Original investigations of significant chemical problems at the master's level under the guidance of a member of the faculty.
Term Offered: Spring, Summer, Fall

CHEM 6970 Graduate Professional Internship
[1-6 credit hours]
Academic adviser approved industrial or non profit internship to provide an experiential learning component to the MS and PhD degrees in chemistry, including the Professional Science Masters Degree in Green Chemistry and Engineering.

CHEM 6980 Special Topics In Chemistry
[1-4 credit hours]
Discussions of newly developing areas in chemistry research.
Term Offered: Spring, Summer, Fall

CHEM 8200 Green Chemistry
[3 credit hours]
Advanced topics in green chemistry, including industrial applications, atom economy, safer solvent substitutions, alternatives assessment, green metrics (PMI, E-factor), basic life cycle analysis, and an introduction to chemical toxicology.
Term Offered: Fall

CHEM 8210 Environmental Chemistry
[3 credit hours]
This course will focus on the chemistry of air, water, and soil with specific emphasis on the effects of human-made chemical products and by-products on the environment. Connections with green chemistry will be highlighted.
Term Offered: Spring

CHEM 8300 Advanced Analytical Chemistry
[4 credit hours]
An overview of new techniques in analytical chemistry. Topics include sample preparation and sampling, spectroscopic, separation, electrochemical, surface characterization and thermal methods.
Term Offered: Fall

CHEM 8310 Separation Methods
[3 credit hours]
The theory, design and application of separation methods. Topics include extraction techniques, gas, liquid, and supercritical fluid chromatography, affinity and chiral separation, and capillary electrophoresis.
Term Offered: Spring

CHEM 8320 Electrochemistry
[4 credit hours]
A fundamental study of electrochemical concepts, methods, instrumentation and applications. Prerequisite: Permission of department.
Term Offered: Spring

CHEM 8330 Spectroscopic Methods And Analysis Of Spectra
[4 credit hours]
A comprehensive study of theory and instrumentation. Applications of spectroscopic methods including spectral interpretation. Topics include a study of absorption, emission, Raman, NMR, ESR, mass spectrometry, and related subjects. Important methodology and strategy in organic synthesis including disconnection and retrosynthetic analysis.
Term Offered: Spring

CHEM 8340 Mass Spectrometry
[4 credit hours]
The principles and applications of mass spectrometry in chemistry, biochemistry, and related disciplines. Prerequisite: Admitted to the graduate program.

CHEM 8350 Separation Methods Laboratory
[1 credit hour]
Experiments covering topics discussed in CHEM 8310 lectures. Five hours of laboratory per week. Approved chemical safety goggles meeting the American National Standard 287.1-1968 must be worn by every student during every laboratory class meeting.
Corequisites: CHEM 8310
Term Offered: Spring

CHEM 8400 Advanced Organic Chemistry
[4 credit hours]
This course deals with chemical structure and reactivity correlations applied to the study of organic reaction mechanisms; stereochemical features including conformation and stereoelectronic effects; reaction dynamics, isotope effects and molecular orbital theory applied to pericyclic and photochemical reactions; and special reactive intermediates including carbenes, carbanions, and free radicals.
Term Offered: Fall

CHEM 8410 Organic Synthesis
[4 credit hours]
Important methodology and strategy in organic synthesis including disconnection and retrosynthetic analysis.
Term Offered: Spring

CHEM 8430 Medicinal Chemistry
[4 credit hours]
Qualitative and quantitative aspects of the design of new therapeutic agents are discussed. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids will be examined.
Term Offered: Fall

CHEM 8440 Carbohydrate Chemistry
[4 credit hours]
Topics in carbohydrate chemistry, including chemical synthesis of complex oligosaccharides, complex glycoconjugates (glycolipids, glycopeptides, and glycoproteins).
Term Offered: Fall

CHEM 8450 Organic Reaction Mechanisms
[3 credit hours]
This course focuses on a thorough treatment of synthetic chemistry through so-called Named Reactions, as well as extensive study of the underlying mechanisms. Course is often conducted as a "flipped classroom", and will require viewing pre-recorded lectures outside of the scheduled class time to allow in class time to focus on practical applications of course material.
Term Offered: Fall

CHEM 8500 Advanced Biological Chemistry
[4 credit hours]
The chemistry of cellular and molecular transformations in biochemical systems. Molecular structure of proteins, nucleic acids and membranes. Metabolism and biosynthesis of carbohydrates, amino acids and lipids; gene regulation and replication.
Term Offered: Fall

CHEM 8510 Protein Chemistry
[4 credit hours]
A detailed analysis of the structure and function of proteins. Current methodology for the analysis of structure, the basis for molecular associations and relationships between structure and biological function.
Prerequisites: CHEM 6500 with a minimum grade of D- or CHEM 8500 with a minimum grade of D-
Term Offered: Spring

CHEM 8520 Enzymology
[4 credit hours]
Survey of current methods to study enzyme-catalyzed reactions, and application to examples from major enzyme, groups. Current topics in enzymology include abzymes and ribozymes, artificial enzymes, and enzymes, and enzyme engineering.
Term Offered: Spring

CHEM 8570 Biophysical Chemistry
[4 credit hours]
Principles and applications of physical chemistry as applied to biological macromolecules (i.e., proteins and nucleic acids in solution), including thermodynamics, kinetics and spectroscopy of macromolecular interactions.
Prerequisites: (PHYS 2080 with a minimum grade of C- and PHYS 2140 with a minimum grade of C-) or CHEM 3520 with a minimum grade of C-
Term Offered: Fall

CHEM 8600 Advanced Inorganic And Organometallic Chemistry
[4 credit hours]
Symmetry, bonding theories, magnetism, and spectroscopic characterization of inorganic compounds are described. Coverage of spectroscopic techniques such as NMR, EPR, UV/VIS, IR, AND Mossbauer focus on applications to inorganic systems.
Term Offered: Fall

CHEM 8610 Chemistry of Transition and Post-Transition Elements
[4 credit hours]
The organometallic chemistry of the transition metals, lanthanides and actinides is described. Synthesis, structure, bonding, and reactivity are considered. Applications in catalysis, bioinorganic, and materials chemistry are discussed.
Term Offered: Fall

CHEM 8620 Chemistry of the Main Elements
[4 credit hours]
The inorganic and organometallic chemistry of main group elements is described. Synthesis, structure, bonding, and reactivity are considered. The use of main group reagents in synthesis, catalysis, and materials chemistry are discussed.
Term Offered: Spring

CHEM 8710 Quantum Chemistry and Spectroscopy
[4 credit hours]
Fundamental principles of quantum mechanics and their application to model systems, atoms and molecules; Introduction to molecular spectroscopy.
Term Offered: Spring

CHEM 8720 Modern Topics in Physical Chemistry
[4 credit hours]
Advanced topics of current interest is physical chemistry. Examples of topics include nanomaterials science, spectroscopic techniques, or molecular modeling.
Term Offered: Spring, Fall

CHEM 8730 Molecular Modeling
[4 credit hours]
Theory and techniques of contemporary molecular modeling, and their application to calculate physical and chemical properties of realistic molecular systems.
Term Offered: Spring, Fall

CHEM 8800 Advanced Materials Chemistry
[4 credit hours]
Introduction to important classes of solids, including conductors, magnetic materials, ferroelectrics, glasses, microporous materials, organic solids. Traditional and novel synthetic approaches, structure/property relationships, and characterization methods specific to solids.
Prerequisites: CHEM 3740 with a minimum grade of C or PHYS 3310 with a minimum grade of C or PHYS 4630 with a minimum grade of C
Term Offered: Spring

CHEM 8810 Materials Science I
[4 credit hours]
A generic materials science approach to the study of crystalline structure and defects (point, line and planar) in crystalline materials. The mechanisms and kinetics of diffusion in the condensed state.
Term Offered: Fall

CHEM 8820 Materials Science II
[4 credit hours]
A materials science approach to the thermodynamics of condensed state equilibria. Phase transformation kinetics.
Term Offered: Spring

CHEM 8830 Nanomaterials Science
[4 credit hours]
This survey course is intended to serve as an introduction to nanotechnology for non-specialists. It is accessible to students in any technical major, including chemists (all divisions), physicists, and engineers. The fundamentals of nanotechnology will be covered, including the origin of nanoscale properties, synthesis and characterization of nanomaterials (e.g. colloids, nanoparticles, nanowires, nanotubes, DNA-based structures), fabrication of larger-scale structures (e.g. self assembly, lithography), and characterization techniques (e.g. microscopy, microanalysis, spectroscopy). Applications will also be discussed.
Term Offered: Spring, Fall

CHEM 8850 X-Ray Crystallography
[4 credit hours]
Theory and practice of structure determination by X-ray diffraction. Basics of symmetry, diffraction, and reciprocal space. Hand-on introduction to single-crystal and powder methods.
Term Offered: Fall

CHEM 8920 Chemistry Colloquium
[0-1 credit hours]
Presentations on research or current literature.
Term Offered: Spring, Summer, Fall

CHEM 8930 Chemistry Seminar
[0-1 credit hours]
Seminars conducted by individual members of the Department.
Term Offered: Spring, Fall

CHEM 8940 Scientific Communication 1
[1 credit hour]
Instruction on different modes of scientific communication focused on written communication, online resources, and scientific ethics. Tools to enable students to think and converse competently in the language of science.
Term Offered: Fall

CHEM 8950 Scientific Communication 2
[1 credit hour]
Instruction on different modes of scientific communication: written communication, oral presentation, and research proposals, to enable students to think and converse competently in the language of science.
Term Offered: Fall

CHEM 8960 Dissertation Research
[1-15 credit hours]
Original investigations of significant chemical problems at the Doctoral level under the guidance of a member of the faculty.
Term Offered: Spring, Summer, Fall

CHEM 8970 Graduate Professional Internship
[1-6 credit hours]
Academic adviser approved industrial or non profit internship to provide an experiential learning component to the M.S. and Ph.D. degrees in chemistry, including the Professional Science Masters Degree in Green Chemistry and Engineering.
Term Offered: Summer

CHEM 8980 Special Topics In Chemistry
[1-4 credit hours]
Discussions of newly developing areas in chemistry research.
Term Offered: Spring, Summer, Fall

Green Chemistry and Engineering, Graduate Certificate

Code	Title	Hours
Required Courses		
CHEM 6200	Green Chemistry	3
CHEM 6210	Environmental Chemistry	3
CHEE 6010	Green Engineering Principles	3
CHEE 6110	Green Engineering Applications	3
*In lieu of taking CHEE 6010, students with an undergraduate degree in chemical engineering may elect to take one of the following courses. Similarly, students that take CHEE 6010 may elect to take one of the following courses in lieu of taking CHEE 6110.		
CHEE 6120	Biofuels	
CIVE 5690	Sustainability Engineering	
Total Hours		**12**

First Term		Hours
CHEM 6200	Green Chemistry (*)	3
CHEE 6010	Green Engineering Principles	3
	Hours	**6**
Second Term		
CHEM 6210	Environmental Chemistry	3
CHEE 6110	Green Engineering Applications	3
	Hours	**6**
	Total Hours	**12**

**In lieu of taking CHEE 6010, students with an undergraduate degree in chemical engineering may elect to take one of the following courses.*

Similarly, students that take CHEE 6010 may elect to take one of the following courses in lieu of taking CHEE 6110.

CHEE 6120	Biofuels	3 credit hours
CIVE 5690	Sustainability Engineering	3 credit hours

- Upon completion of the required coursework, students will be able to: 1. Apply knowledge of green synthesis methods and associated green chemistry metrics.
- 2. Evaluate the environmental fate and impacts of chemical emissions using appropriate tools for quantifying human, aquatic, and physical impacts.
- 3. Perform process optimization to reduce environmental impacts.
- 4. Identify and evaluate public health, safety, and ethical concerns in the global chemical industry.
- 5. Apply knowledge of chemical alternative assessments to evaluate and select safer chemicals for use in both chemical product manufacturing and consumer product applications.

MS in Chemistry

The **research-based MS program** in chemistry increases the professional competence of the chemist beyond the bachelor's degree. Course work, independent research culminating in the defense of an original thesis, and small group discussions are emphasized to achieve these goals. The MS degree can be viewed as an important professional goal or as preparation for study toward the doctoral degree. 30 credit hours are required to earn the research-based MS.

The objective of the **non-thesis MS program** is to provide an alternate pathway for students to obtain an MS degree in chemistry that does not involve an in-depth research project or a thesis. This degree option is intended for area residents whose current work responsibilities, or intellectual property issues with their employer, preclude the possibility of conducting the requisite research for the traditional research-based MS degree. School teachers, non-traditional students, and employees of local industry who want to earn an MS degree for promotions and/or to meet eligibility requirements for teaching positions at regional community colleges may wish to pursue this degree option. 30 credit hours are required to earn the non-thesis MS.

The Department of Chemistry and Biochemistry and the Department of Chemical Engineering, in conjunction with the School of Green Chemistry and Engineering, offer a **concentration in Green Chemistry and Engineering**. The program is designed for students who want to concentrate their studies on principles of green chemistry and green engineering and incorporate aspects of business and other professional skills components into their master's degree and future career.

The concentration in Green Chemistry and Engineering is approved and affiliated with the National Professional Science Master's Association and requires 36 credit hours to graduate. The Green Chemistry and Engineering concentration is a terminal degree that prepares students for immediate employment opportunities in industry, government, and nongovernmental organizations. It is not a research-based degree. The program provides a foundation in chemistry, chemical engineering, toxicology, environmental chemistry, life cycle assessment, chemical alternatives assessment, regulations and policy, and business.

More information on activities of the School of Green Chemistry and Engineering and/or the Green Chemistry and Engineering concentration visit our website at *https://www.utoledo.edu/nsm/sgce/*

- Requirements for the thesis-based master's program (p. 204)
- Requirements for the non-thesis master's program (p. 205)
- Requirements for the concentration in green chemistry and engineering (p. 205)

Requirements for the Thesis-Based Master's Program

For the degree of master of science, students must meet the following departmental requirements:

1. The courses presented must total at least 30 hours of graduate credit, including at least four hours of credit in graduate research.
2. Registration for research seminar is typically required each term the student is enrolled in graduate research.
3. Each candidate must present a thesis.
4. Registration for chemistry colloquium is typically required each term, but no more than four hours of credit may count within the required 30 hours.
5. Each candidate must demonstrate satisfactory performance on a comprehensive oral examination on his or her thesis research, in addition to the public defense of the thesis at a colloquium presentation.
6. Upon choosing a research director, an advisory committee will be appointed to supervise the research, to administer the comprehensive oral examination, and to approve the thesis. Each student, in conjunction with the director of graduate studies, the research director, and the student's advisory committee, will prepare a plan of study listing the courses and other requirements for the degree. Upon approval, the plan of study becomes the list of course requirements for the degree. Students are required to take four or more 6000-level courses covering at least three different subdisciplines of chemistry as part of the plan of study.
7. Each student must register and successfully complete CHEM 6940 and CHEM 6950.

REQUIREMENTS FOR THE NON-THESIS MASTER'S PROGRAM

For the non-thesis (coursework-based) master of science concentration, students must meet the following departmental requirements:

1. The courses presented must total at least 30 hours of graduate credit.
2. Each student, in conjunction with the director of graduate studies, will prepare a plan of study listing the courses and other requirements for the degree. Upon approval, the plan of study becomes the list of course requirements for the degree. Students are required to take five or more chemistry 6000-level courses (minimum 20 credit hours) as part of the plan of study. To establish breadth in knowledge, at least one course in each of four (out of seven) subdisciplines of chemistry (analytical, biochemistry, green and environmental, inorganic, materials, organic, physical) must be completed. Up to 8 hours of 6000-level courses in other fields may also be applied

towards the degree with permission of the director of graduate studies.

3. Credit for thesis research, research seminar, or chemistry colloquium may not be applied towards the required 30 hours.
4. Each candidate must take CHEM 6940 and CHEM 6950 and demonstrate satisfactory performance on a comprehensive review of a topic from the chemistry or biochemistry literature.

Combined bachelor's to master's - BS in Chemistry(ACS-Certified Concentration or Materials Chemistry Concentration)/MS in Chemistry - Non-thesis Concentration and BS in Biochemistry/MS in Chemistry - Non-thesis Concentration

1. Undergraduate students in the BS in Chemistry(ACS-Certified Concentration or Materials Chemistry Concentration) or the BS in Biochemistry program who are accepted into the accelerated degree pipeline program option will be admitted to the SM-CHEM-MS (MS in Chemistry - Non-Thesis Option) and allowed to complete up to nine credit hours or graduate courses after reaching junior status. Students must request admission into the BSMS program through their advisor no earlier than the spring of their sophomore year and no later than the spring of their junior year. To qualify for the pipeline program, an undergraduate student must have a GPA of at least 3.0 in CHEM courses and have the permission of their advisor. Students below this GPA cutoff may petition the department for admission. Students accepted into the pipeline program will develop a plan of study in consultation with their advisor and must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate.

   Once the student is admitted to the graduate program, there will be two matriculations: (1) the undergraduate program will remain primary and (2) the graduate program becomes secondary. They will then continue into the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) completed in the final undergraduate year may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements. When the student applies for graduation from the undergraduate program an automatic registration hold is placed on student records. However, as there is a second active program tied to the student's record, the Registrar's Office will send the list of students with an active graduate matriculation to COGS to ensure that future registration at the graduate-level is not restricted.

   The following provisions apply for classes taken for graduate credit:

   a. Only graduate classes taken at The University of Toledo after the student is accepted in the BS/MS program may be included.
   b. For students in the B.S. Chemistry/M.S. Chemistry (Non-Thesis Option) pipeline, the following courses may be included in the approved nine semester hours of graduate credit taken as an undergraduate: CHEM 6200, 6210, 6300, 6310, 6320, 6330, 6340, 6400, 6410, 6420, 6430, 6440, 6500, 6510, 6520, 6570, 6600, 6610, 6620, 6700, 6710, 6720, 6730, 6800, 6810, 6820, 6830, 6850, 6940, 6950, 6980. The choice of courses should be relevant to the agreed upon plan of study.
   c. For students in the B.S. Biochemistry/M.S. Chemistry (Non-Thesis Option) pipeline, the approved nine semester hours of graduate credit taken as an undergraduate should include CHEM 6500, CHEM 6570, and CHEM 6940. Substitutions to these courses may be made with authorization of advisor.
   d. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

Requirements for Chemistry - Green Chemistry and Engineering Concentration, MS

1. The courses presented must total at least 30 hours of graduate credit.
2. Each student, in conjunction with the director of graduate studies and the director of the School of Green Chemistry and Engineering, will prepare a plan of study listing the courses and other requirements for the degree. Upon approval, the plan of study becomes the list of course requirements for the degree. Students are required to take:

Code	Title	Hours
CHEM 6200	Green Chemistry	3
CHEM 6210	Environmental Chemistry	3
CHEE 6010	Green Engineering Principles	3
CHEE 6110	Green Engineering Applications	3
Select 16 credit hours of elective graduate coursework in traditional areas of chemistry or chemical engineering		16
CHEM 6970 or CHEE 6970	Graduate Professional Internship Graduate Engineering Internship	2
Total Hours		**30**

3. Each student must complete a 2 credit hour graduate industrial internship (CHEM 6970/CHEE 6970) or independent study project (CHEM 6960/CHEM 6980/CHEE 6920). The independent study project or internship topic for CHEM 6960, CHEM 6970, CHEE 6970, CHEM 6980, and CHEE 6920 must be approved by the program director.
4. Up to 4 credit hours of 6000-level coursework in a related discipline (e.g., environmental sciences, physics) and an additional 1 credit hour of independent research project (CHEM 6960, CHEM 6970, CHEM 6980, CHEE 6970, or CHEE 6920) may be applied to the 16 credit hours of required electives with approval from the program director. One of the following business courses may also be applied to the minimum 16 credit hours of electives: BUAD 6600, EFSB 6690, EFSB 6590.

   Research seminar (CHEM 6930) and colloquium (CHEM 6920) cannot be applied towards the 30 hour minimum for the concentration

Combined bachelor's to master's

BS in Chemistry(ACS-Certified Concentration or Materials Chemistry Concentration)/MS in Chemistry - Green Chemistry and Engineering Concentration
BS in Biochemistry/MS in Chemistry - Green Chemistry and Engineering Concentration

Undergraduate students in the BS in Chemistry(ACS-Certified Concentration or Materials Chemistry Concentration) or the BS in Biochemistry program who are accepted into the accelerated degree pipeline program option will be admitted to the SM-CHEM-MS-GRCE(MS in Chemistry – Green Chemistry and Engineering Concentration) and allowed to complete up to nine credit hours or graduate courses after reaching junior status. Students must request admission into the BSMS program through their advisor no earlier than the spring of their sophomore year and no later than the spring of their junior year. To qualify for the pipeline program, an undergraduate student must have a GPA of at least 3.0 in CHEM courses and have the permission of their advisor. Students below this GPA cutoff may petition the department for admission. Students accepted into the pipeline program will develop a plan of study in consultation with their advisor and must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate.

Once the student is admitted to the graduate program, there will be two matriculations: (1) the undergraduate program will remain primary and (2) the graduate program becomes secondary. They will then continue into the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) completed in the final undergraduate year may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements. When the student applies for graduation from the undergraduate program an automatic registration hold is placed on student records. However, as there is a second active program tied to the student's record, the Registrar's Office will send the list of students with an active graduate matriculation to COGS to ensure that future registration at the graduate-level is not restricted.

The following provisions apply for classes taken for graduate credit:

a. Only graduate classes taken at The University of Toledo after the student is accepted in the BS/MS program may be included.
b. For students in the BS in Chemistry(ACS-Certified Concentration or Materials Chemistry Concentration)/MS in Chemistry - Green Chemistry and Engineering Concentration and BS in Biochemistry/MS in Chemistry - Green Chemistry and Engineering Concentration pipelines, the approved nine semester hours of graduate credit taken as an undergraduate should include CHEM 6200, CHEM 6210, and CHEE 6010. Substitutions to these courses may be made with authorization of advisor.
c. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

MS in Chemistry Learning Outcomes

- PLO 1 (Thesis-Based Option): Demonstrate proficiency in and apply fundamental concepts with a focus in a single area and breadth in at least three other areas of chemistry and biochemistry.
- PLO 2 (Thesis-Based Option): Locate, critically analyze, and use relevant information in the research literature and databases.
- PLO 3 (Thesis-Based Option): Conduct experiments and/or computational modeling appropriate for investigating research questions in chemistry/biochemistry.
- PLO 4 (Thesis-Based Option):Conduct and report the results of an original research project.
- PLO 5 (Thesis-Based Option): Effectively and clearly communicate scientific information in oral and written format to both experts and non-experts.
- PLO 1 (Non-Thesis Option): Demonstrate proficiency in and apply fundamental concepts in at least four different subdisciplines of chemistry and biochemistry in addition to other related fields.
- PLO 2 (Non-Thesis Option): Locate, critically analyze, and use relevant information in the research literature and databases.
- PLO 3 (Non-Thesis Option): Conduct an in-depth literature-based investigation of a specific topic in chemistry or biochemistry and present a review of the current state of published research on that topic.
- PLO 4 (Non-Thesis Option): Effectively and clearly communicate scientific information in oral and written format to both experts and non-experts.

MS in Chemistry - Green Chemistry and Engineering Concentration Learning Outcomes

- PLO 1. Apply knowledge of green synthesis methods and calculate associated green chemistry metrics.
- PLO 2. Evaluate the environmental fate and impacts of chemical emissions using appropriate tools for quantifying human, aquatic, and physical impacts.
- PLO 3. Perform process optimization to reduce environmental impacts.
- PLO 4. Identify and evaluate public health, safety, and ethical concerns in the global chemical industry.
- PLO 5. Apply knowledge of chemical alternative assessments to evaluate and select safer chemicals for use in both chemical product manufacturing and consumer product applications.

PhD in Chemistry

The doctoral program in chemistry is designed to ensure that the student has the basic foundation of knowledge and is equipped with the tools necessary to perform independent research. The emphasis on research recognizes the power of original research to arouse the scientific curiosity of the student, to develop and stimulate creativity, and to encourage further discovery through independent study.

The doctoral program is divided into three stages for the typical student:

Stage 1 - The student develops a plan of study including establishing a set of prescribed courses to serve as the foundation for further training. A research director is also chosen.

Stage 2 - The student pursues research toward the dissertation, prepares a required formal research proposal, and undertakes a qualifying examination.

Stage 3 – The student is admitted to candidacy after successful completion of the qualifying examination requirement. The student then focuses efforts on research, publishing their results, and completion of the doctoral dissertation.

90 credit hours are required to earn the PhD.

Candidates for the doctor of philosophy degree must meet the following requirements:

1. Each student, in conjunction with the director of graduate studies, the student's research director, and the student's advisory committee, will prepare a doctoral program proposal (plan of study) listing the courses and other requirements for the degree. Upon approval, the program proposal becomes the list of courses and other requirements for the degree. Students are required to take six or more 8000-level courses covering at least four different subdisciplines of chemistry as part of the plan of study.
2. Successful completion of a comprehensive qualifying examination for entry to doctoral candidacy.
3. Registration for chemistry colloquium is typically required each term.
4. Registration for research seminar is typically required each term the student is enrolled in graduate research.
5. Each student must satisfactorily complete two semesters of supervised, half-time teaching.
6. After admission to candidacy, each student is required to spend a minimum of two consecutive semesters in full-time study at The University of Toledo.
7. Dissertation research must be carried out primarily in laboratories of The University of Toledo.
8. Each candidate must demonstrate satisfactory performance on a comprehensive oral examination on his or her dissertation research, in addition to the public defense of the dissertation at a colloquium presentation.
9. Each student must register and successfully complete CHEM 8940 and CHEM 8950.

- PLO 1. Demonstrate mastery of and apply advanced concepts in chemistry/biochemistry with a focus in a single area and breadth in at least three other areas.
- PLO 2. Locate, critically analyze, and use relevant information in the research literature and databases.
- PLO 3. Design and conduct experiments and/or computational modeling; critically analyze and interpret data and results.
- PLO 4. Propose, conduct, and report the results of an original research project advancing knowledge in an area of chemistry or biochemistry.
- PLO 5. Effectively and clearly communicate scientific information in oral and written format to both experts and non-experts.

Department of Environmental Sciences

Jonathan M. Bossenbroek, chair
Von Sigler, associate chair
Jeanine Refsnider*, graduate advisor*

The department of environmental sciences (DES) offers graduate degrees in biology and environmental sciences at the master's level and in biology and environmental sciences at the doctoral level. Students entering the M.S. or Ph.D. programs are expected to have an adequate background in the natural sciences and mathematics, but may be admitted on a provisional basis if they lack such a background. Complete program details are available at the department website.

Mission Statement

The Mission of the Department of Environmental Sciences is to conduct research to create today's environmental solutions, teach to train tomorrow's environmental leaders, and serve to promote global environmental awareness.

General Description

The Toledo region offers potential students an ideal natural laboratory for studies in ecology, geology, and environmental sciences because it is located where unique natural habitats and landforms occur in proximity to high human population and natural resource use. Toledo is in northwestern Ohio, on the western shore of Lake Erie at the mouth of the Maumee River. The greater metropolitan area is characterized by glacial terrains, and agricultural, urban, and natural ecsystems. Local rivers, Lake Erie's productive fisheries and wetlands, the remarkable diversity of the Oak Openings savannas and woodlands, and wetland remnants of the Great Black Swamp, make the Toledo region a dynamic location for the study of environmental sciences as well as an enjoyable place to live and work.

The Department's strengths in education and research are in the areas of: Earth surface processes; aquatic, landscape, microbial, plant, soil, systems, and vertebrate ecology; and bioremediation and phytoremediation. Research in other areas of both ecology and geology is also conducted. Much of this research occurs in the Toledo region.

Degrees OffereD

- Hydrogeology and Groundwater Modeling, Graduate Certificate (p. 210)
- Master of Science in Biology -Ecology and Organismal Biology Concentration (p. 211)
- MS in Environmental Science (p. 211)
- PhD in Biology (Ecology and Organismal Biology Concentration) (p. 212)
- PhD in Environmental Science (p. 213)

EEES 5100 Advanced Glacial and Quaternary Geology
[3 credit hours]
To provide broad geologic understanding of cyclical events including glaciation, sea level, and ice sheet paleogeography during the Quaternary Period. Also, to provide detailed geologic understanding of what a glacier is and how it shapes the landscape. Specific topics will include mass balance, ice flow, hydrology, erosion, deposition, resultant landforms, glacial lake environments, and development of the regional glacial landscape. A field trip is mandatory.
Term Offered: Spring

EEES 5150 Organic Evolution
[3 credit hours]
The modern theory of evolution is presented within a general framework of biological and geological evidence focusing on the fossil record, early biomolecules, protein synthesis, genetics, phylogeny and vertebrate evolution.
Term Offered: Spring, Summer

EEES 5160 Advanced Environmental Data Management and Visualization
[3 credit hours]
A course in data management for environmental science graduate students covering the basics of data management practices and using Excel and R for data preparation, evaluation, analysis, visualization, and interpretation.
Term Offered: Fall

EEES 5220 Environmental Geochemistry
[3 credit hours]
Chemical reactions of environmental concern. Water and soil chemistry related to contaminant fate and mobility. Computer software used.
Term Offered: Spring

EEES 5240 Soil Science
[3 credit hours]
Basic principles of soil formation of physics, chemistry and biology with emphasis on their influence on fluid and chemical migration and preservation of soil quality from geological, agricultural and environmental perspectives.
Term Offered: Spring, Fall

EEES 5350 Ecology and Conservation of Reptiles and Amphibians
[3 credit hours]
Ecology, diversity, evolution, and conservation of amphibians and reptiles. Lectures will discuss natural history, trait diversity, evolutionary context, and ecological implications of amphibians and reptiles. Hands-on activities will include taxonomy and identification of local species, survey and field methods, and discussions of scientific literature. Throughout this course, the biology of amphibians and reptiles will be emphasized in the context of conservation.
Term Offered: Spring

EEES 5410 Hydrogeology
[3 credit hours]
Fundamentals of groundwater/earth interactions are introduced concentrating on physical aspects of groundwater flow with applications to the field of water resources and contaminant investigations.
This course is designed as the fundamental course in groundwater for students who plan to use hydrogeology in their careers, e.g., environmental geologists, civil and environmental engineers, environmental specialists and scientists, and petroleum geologists.
Prerequisites: MATH 1750 with a minimum grade of D- or MATH 1850 with a minimum grade of D- or MATH 1830 with a minimum grade of D- or MATH 1920 with a minimum grade of D-
Term Offered: Spring

EEES 5480 GIS Applications in ENSC
[3 credit hours]
An applications course focused on using GIS techniques and applications in environmental problems and research.
Term Offered: Fall

EEES 5490 Remote Sensing of the Environment
[4 credit hours]
Introduction to theory, methods and techniques used to gather and analyze remote sensor data. Topics range from low altitude air photo interpretation through satellite image acquisition.
Prerequisites: GEPL 3550 with a minimum grade of D- and EEES 2100 with a minimum grade of D-
Term Offered: Fall

EEES 5600 Oceanography
[3 credit hours]
An exploration of the geological, physical, chemical and biological nature of the oceans. Emphasis on the origin and evolution of ocean basins, plate tectonics, properties of seawater, and physical processes of circulation, especially as related to climate, the hydrologic cycle, and life in the oceans.
Prerequisites: (EEES 2100 (may be taken concurrently) with a minimum grade of C- or EEES 1010 (may be taken concurrently) with a minimum grade of C-) and (MATH 1210 (may be taken concurrently) with a minimum grade of C- or MATH 1320 (may be taken concurrently) with a minimum grade of C- or MATH 1340 (may be taken concurrently) with a minimum grade of C-)
Term Offered: Spring

EEES 5610 Environmental Geophysics
[3 credit hours]
An introduction to basic geophysical concepts, signals, and information content. Course includes an overview of the theory, field application, and interpretation of geophysical methods. Discussion of the applications for characterizing and monitoring environmental systems, including soils, groundwater, and other ecosystem units. Case studies include the use of geophysics for soil, groundwater, archaeological, forensic, engineering, and ecological investigations. The course involves field demonstrations and hands-on exercises on field applications of geophysical techniques.
Prerequisites: (PHYS 2070 with a minimum grade of D- and PHYS 2080 with a minimum grade of D- and MATH 1850 with a minimum grade of D- and MATH 1860 with a minimum grade of D-)
Term Offered: Spring

EEES 5650 Advanced Geology Field Studies
[1-4 credit hours]
Intensive field studies to various areas of geologic interest. Studies may involve various geologic field methods and descriptive techniques. Course may be repeated multiple times. Fall and Spring.

EEES 5730 Advanced Aquatic Ecology
[3 credit hours]
Advanced cross-disciplinary concepts in the ecology of aquatic environments emphasizing the biology of populations, communities and ecosystems. Includes a project on the application of principles and theory to help understand and solve a management problem in aquatic systems.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Fall

EEES 5740 Advanced Aquatic Ecology Laboratory
[1 credit hour]
Laboratory exercises on the biology of aquatic populations, communities and ecosystems.
Corequisites: EEES 5730
Term Offered: Fall

EEES 5750 Advanced Conservation Biology
[4 credit hours]
Advanced cross-disciplinary concepts in the application of principles and theory to the study and maintenance of biological diversity in temperate, subtropical and tropical systems. Lectures, classroom discussion and readings.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Spring

EEES 5760 Advanced Landscape Ecology
[3 credit hours]
This course is for graduate students from a variety of disciplines. Emphasis will be placed on up-to-date knowledge and methods in landscape analysis, pattern-process relationship and potential management applications at multiple spatial and temporal scales.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Spring, Fall

EEES 5790 Ecology Field Study
[2-4 credit hours]
Field study of globally significant ecosystem(s), including analysis of structural and functional relationships within and between ecosystems. Opportunities for individual student projects.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Spring, Summer

EEES 6100 Glacial Stratigraphy And Geophysics
[3 credit hours]
To integrate glacial sedimentology and stratigraphy, with near-surface, geophysical methodologies. Field work to collect a variety of field data to analyze in the lab is mandatory. Data to be presented as posters.
Term Offered: Fall

EEES 6250 Graduate Launch
[1 credit hour]
This course prepares graduate students for success by preparing individual study plans, research proposals and presentations, and launching bibliographic research.
Term Offered: Spring, Fall

EEES 6300 Integrated Environmental & Earth Systems
[3 credit hours]
Fundamental concepts in environmental science explored through relationships in the integrated earth system.
Term Offered: Spring, Fall

EEES 6400 Environmental Statistics
[4 credit hours]
Applied statistics (model formulation, parameter estimation, and model evaluation) for environmental and ecological data analysis.
Prerequisites: EEES 4160 with a minimum grade of C- or EEES 5160 with a minimum grade of C-
Term Offered: Spring

EEES 6440 Contaminant Hydrogeology
[3 credit hours]
Groundwater contaminant sources, impacts, transport, geochemistry and remediation in relation to geological environments with attention to sampling, detection, characterization, modeling and aquifer protection.
Prerequisites: EEES 5410 with a minimum grade of D-

EEES 6450 Advanced Applied Hydrogeology
[3 credit hours]
Applications of hydrogeological monitoring, analyses and modeling using mathematics, statistics and computers. Subjects include: well field and pump test design, sampling strategies, data presentation and analysis and modeling fundamentals.
Prerequisites: EEES 5410 with a minimum grade of C
Term Offered: Spring

EEES 6600 Foundations of Ecology
[3 credit hours]
This course is a thorough review of ecological concepts for graduate students including workshops exploring classic quantitative models in ecology.
Term Offered: Spring, Fall

EEES 6650 Statistical Modeling in Environmental Sciences
[4 credit hours]
Statistical modeling techniques applied to environmental problems, with an emphasis on multilevel modeling.
Prerequisites: EEES 6400 with a minimum grade of D-
Term Offered: Spring

EEES 6810 Writing For The Environmental Sciences
[3 credit hours]
Learn to write papers that get cited and proposals that get funded. This course focuses on building the fundamental skills required for effective scientific writing. Writing exercises focus on improving the clarity and persuasiveness of student theses, manuscripts, and proposals. This course is for anyone who wants to improve their science writing, is writing theses or proposals, or who may have to write on the job.

EEES 6930 Seminar
[1 credit hour]
Individual presentation and discussion of papers in the environmental sciences.
Term Offered: Spring, Fall

EEES 6960 Thesis Research
[1-15 credit hours]
Research on a particular geologic problem leading to a written thesis which must be presented and defended before a faculty committee.
Term Offered: Spring, Summer, Fall

EEES 6980 Special Topics
[1-4 credit hours]
A graduate course covering some aspect of environmental sciences not covered in the formal graduate curriculum. Students may repeat the course for credit as topics vary.
Term Offered: Spring, Summer, Fall

EEES 6990 Independent Study
[1-4 credit hours]
Student selects an approved subject for individual study and prepares a detailed report, or gives equivalent evidence of mastering of the selected subject. Taken only as S/U.
Term Offered: Spring, Summer, Fall

EEES 7730 Advanced Aquatic Ecology
[3 credit hours]
Advanced cross-disciplinary concepts in the ecology of aquatic environments emphasizing the biology of populations, communities and ecosystems. Includes a project on the application of principles and theory to help understand and solve a management problem in aquatic systems.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Fall

EEES 7790 Ecology Field Trip
[2-4 credit hours]
Field study of globally significant ecosustem(s), including analysis of structural and functional relationships within and between ecosystems. Opportunities for individual student projects.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Spring, Summer

EEES 8250 Graduate Launch
[1 credit hour]
This course prepares graduate students for success by preparing individual study plans, research proposals and presentations, and launching bibliographic research.
Term Offered: Spring, Fall

EEES 8300 Integrated Environmental & Earth Systems
[3 credit hours]
Fundamental concepts in environmental science explored through relationships in the integrated earth system.
Term Offered: Spring, Fall

EEES 8400 Environmental Statistics
[4 credit hours]
Applied statistics (model formulation, parameter estimation, and model evaluation) for environmental and ecological data analysis.
Prerequisites: EEES 4160 with a minimum grade of C- or EEES 5160 with a minimum grade of C-
Term Offered: Spring

EEES 8600 Foundations of Ecology
[3 credit hours]
This course is a thorough review of ecological concepts for graduate students including workshops exploring classic quantitative models in ecology.
Term Offered: Spring, Fall

EEES 8650 Statistical Modeling in Environmental Sciences
[4 credit hours]
Statistical modeling techniques applied to environmental problems, with an emphasis on multilevel modeling.
Prerequisites: EEES 6400 with a minimum grade of D- or EEES 8400 with a minimum grade of D-
Term Offered: Spring, Fall

EEES 8810 Writing For The Environmental Sciences
[3 credit hours]
Learn to write papers that get cited and proposals that get funded. This course focuses on building the fundamental skills required for effective scientific writing. Writing exercises focus on improving the clarity and persuasiveness of student theses, manuscripts, and proposals. This course is for anyone who wants to improve their science writing, is writing theses or proposals, or who may have to write on the job.

EEES 8930 Seminar In Ecology
[1 credit hour]
Presentation on research or current literature by graduate doctoral students, faculty or guest speakers.
Term Offered: Spring, Fall

EEES 8960 Doctoral Dissertation Research
[1-15 credit hours]
Research on a particular problem leading a written dissertation that must be presented and defended before a faculty committee.
Term Offered: Spring, Summer, Fall

EEES 8980 Advanced Topics In Ecology
[2-4 credit hours]
Course covering some aspect of ecology not covered in the formal graduate curriculum. Students may repeat the course for different topics.
Term Offered: Spring, Summer, Fall

EEES 8990 Advanced Readings In Ecology
[1-4 credit hours]
Faculty-directed readings or projects in a specific area of ecology. Students may repeat the course for different topics.
Term Offered: Spring, Summer, Fall

Hydrogeology and Groundwater Modeling, Graduate Certificate

A minimum of 9 credit hours of approved graduate coursework is required for the certificate in Hydrogeology and Groundwater Modeling. The following course is required:

Code	Title	Hours
EEES 5410	Hydrogeology	3
Select two of the following		6
EEES 5220	Environmental Geochemistry	
EEES 5610	Environmental Geophysics	
EEES 6100	Glacial Stratigraphy And Geophysics	

EEES 6440	Contaminant Hydrogeology
EEES 6450	Advanced Applied Hydrogeology
Total Hours	**9**

- Students will develop research questions and state a hypotheses that can be answered with data and observations.
- Students will be able to calculate groundwater flow rates, fluxes and storage.
- Students will evaluate groundwater resource availability and quality.
- Students will apply mathematical reasoning and scientific inquiry to hydrogeological problems.
- Students will be able to operate geophysical and coring equipment for field data collection.
- Students will process digital geophysical data and interpret and synthesize that data.

Master of Science in Biology - Ecology and Organismal Biology Concentration

The master's degree in Biology- Ecology and Organismal Biology Concentration provides students who have completed an undergraduate degree in biology or closely related discipline, an opportunity for in-depth study of ecology. The master's degree requires at least 30 credit hours of graduate course work approved by the student's advisory committee and either a thesis, or original report (non-thesis option)

The master's degree in biology prepares students to enter a Ph.D. program or for career opportunities with environmental consulting firms and industry, state natural-resource agencies and geological surveys, planning commissions and water-resource agencies, state and national regulatory agencies, universities, colleges and secondary schools.

Ecology and Organismal Biology Concentration

Option A (Thesis): A minimum of 30 credit hours of approved graduate coursework is required for the master's degree in biology (average 42 hours). This includes 24 hours of formal courses (excluding EEES 6960 and EEES 6990) with a minimum of 19 hours in DES that must include:

Code	Title	Hours
EEES 5160	Advanced Environmental Data Management and Visualization	3
EEES 6250	Graduate Launch	1
EEES 6400	Environmental Statistics	4
EEES 6600	Foundations of Ecology	4
EEES 6930	Seminar (EEES 6930-009, 1 hour per semester)	1

The remaining courses selected with approval of the student's thesis committee taken at the 5000 level or above; all but EEES 6930 (seminars) must be taken for a letter grade (A–F). Additional credit hours will include EEES 6960 and/or EEES 6990, a maximum of 6 hours of which may be taken for a letter grade, and may also include other DES or non-DES courses that need not be taken for a letter grade. The student must also prepare a thesis consisting of a written report on original independent research conducted by the student under the supervision of their thesis advisor (or co-advisors) and defend this thesis before their advisory committee.

Option B (Non-thesis): The non-thesis option for a master's degree in biology differs from the thesis option (above) by requiring 27 hours of formal courses and a maximum of 3 hours of EEES 6960 or EEES 6990; all but EEES 6930 (seminars) must be taken for a letter grade (A–F). The student also must write an original report based on library research and defend this report before his or her advisory committee.

- PLO 1. Students will demonstrate an in-depth understanding of and the ability to communicate scientific information within an area of specialized study within the biological sciences.
- PLO 2. A) Thesis track: Students will demonstrate an ability to conduct experiments, collect and interpret data, and disseminate those data in written and verbal modalities. B) Non-thesis track: Students will demonstrate an ability to review and evaluate the published literature and effectively communicate their findings in verbal and written modalities.
- PLO 3. Students will demonstrate knowledge of their ethical responsibility when conducting research in terms of proper scientific conduct and the rights of human subjects.

MS in Environmental Science

The master's degree in Environmental Sciences provides students an interdisciplinary understanding of how the Earth's systems are interrelated and training to handle and interpret the wide variety of data that is incorporated into this type of research.

The master's degree requires at least 30 credit hours of graduate course work approved by the student's advisory committee and either a thesis, or original report (non-thesis option). A master's degree in Environmental Science prepares students to enter a Ph.D. program or for career opportunities with environmental consulting firms and industry, state natural-resource agencies and geological surveys, planning commissions and water-resource agencies, state and national regulatory agencies, universities, colleges and secondary schools.

Partial completion of this degree can include our Certificate in Hydrogeology and Groundwater Modeling.

Option A (Thesis):#A minimum of 30 credit hours of approved graduate coursework is required for the master's degree in environmental science. This includes 24 hours of formal courses (excludingEEES#6960#andEEES#6990) with a minimum of 19 hours in DES that must include:

Code	Title	Hours
EEES 5160	Advanced Environmental Data Management and Visualization	3
EEES 6250	Graduate Launch	1
EEES 6300	Integrated Environmental & Earth Systems	3
EEES 6930	Seminar	1

The remaining courses selected with approval of the student's thesis committee taken at the 5000 level or above; all but#EEES 6930 must be taken for a letter grade (A–F). Additional credit hours will include EEES 6960 Thesis Research and/or EEES 6990 Independent Study, a maximum of 6 hours of which may be taken for a letter grade, and may also include other DES or non-DES courses that need not be taken for a letter grade. The student must also prepare a thesis consisting of a written report on original independent research conducted by the student under the supervision of their thesis advisor (or co-advisors) and defend this thesis before their advisory committee.

Option B (Non-thesis):#The non-thesis option for a master's degree in environmental science differs from the thesis option (above) by requiring 27 hours of formal courses and a maximum of 3 hours ofEEES#6960#orEEES#6990; all butEEES#6930#(seminars) must be taken for a letter grade (A–F). The student also must write an original report based on literature research and defend this report before their advisory committee.

Combined bachelor's to master's-Environmental Sciences Pipeline Program

Undergraduate students accepted to the Environmental Sciences Pipeline Program will be admitted to the MS Environmental Sciences Non-thesis program and allowed to complete up to nine credits of graduate level classes during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in to the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

ELIGIBILITY REQUIREMENTS

UT undergraduate students must 1) be majoring in either Biology with a Concentration in Ecology and Organismal Biology or Environmental Sciences, 2) have a minimum of 3.2 cumulative undergraduate grade point average that will include undergraduate credits earned at other institutions and transferred to UT, and 3) have approval of their advisor and department chair.

APPLICATION PROCESS

Students holding a junior standing should apply by March 31 of that year. Application to this early pipeline program must contain 1) a letter of interest, 2) a completed graduate admission application, and 3) at least 3 letter(s) of recommendation from faculty members.

Pipeline B.S. to M.S. COURSES

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) EEES 6250 Graduate Launch and EEES 6300 Integrated Environmental & Earth Systems must be taken in the last two semesters of their undergraduate program, 3) Any other EEES course at the 5000 or 6000 level may be included in the approved nine semester hours of graduate credit taken as an undergraduate.

First Year		
First Term		**Hours**
EEES 5160	Advanced Environmental Data Management and Visualization	3
EEES 6250	Graduate Launch	1
EEES 6930	Seminar	1
EEES 6300	Integrated Environmental & Earth Systems	3
EEES 6960	Thesis Research	1-15
	Hours	**9-23**
Second Term		
EEES 6930	Seminar	1
Elective		6
EEES 6960	Thesis Research	1-15
	Hours	**8-22**
Second Year		
First Term		
EEES 6930	Seminar	1
Elective		3
EEES 6960	Thesis Research	1-15
	Hours	**5-19**
Second Term		
EEES 6930	Seminar	1
Elective		3
EEES 6960	Thesis Research	1-15
	Hours	**5-19**
	Total Hours	**27-83**

- Students will demonstrate an in-depth understanding and the ability to communicate scientific information within an area of specialized study within the environmental sciences.
- Students will implement an independent research project (thesis) or write an original report based on literature research (non-thesis)
- Students will interpret results based on data collected and analyzed in courses or for their thesis project.
- Students will present and disseminate results from course or thesis work in written and verbal modalities.
- Students will demonstrate ethical responsibility when conducting research in terms of proper scientific conduct and the rights of human subjects.

PhD in Biology (Ecology and Organismal Biology Concentration)

The doctoral degree in biology (ecology track) is awarded to a student who has demonstrated mastery in the field of ecology and a distinct ability to make substantial contributions to the field. The doctoral degree in biology prepares students to enter research careers at academic

institutions or state and federal natural-resource agencies, environmental consulting firms, and nonprofit and non-government organizations (NGOs).

The doctoral degree provides a foundation in ecology, research methodologies and practices, rigorous hypothesis-driven scientific investigation, and the dissemination of research results and ideas.

In general, work for the Ph.D. takes five years of study beyond the bachelor's degree. A substantial portion of this time is spent in independent research leading to a dissertation. Up to 30 hours from a master's degree program may apply as part of the student's doctoral program. Normally 90 credit hours of study beyond the bachelor's degree are required for the Ph.D.

The doctoral degree in biology (Ecology and Organismal Biology Concentration) is awarded to a student who has demonstrated mastery in the field of biology and a distinct and superior ability to make substantial contributions to the field. The quality of work and the resourcefulness of the student must be such that the faculty can expect a continuing effort toward the advancement of knowledge and significant achievement in the discipline.

In general, work for the Ph.D. requires a minimum of 90 credit hours of study beyond the bachelor's degree. A substantial portion of this time is spent performing independent research leading to an original thesis that is substantially more in depth than a MS thesis. Work performed toward a MS may apply in part to the student's doctoral program.

Each student must complete an individualized program of study in an area of ecology that is approved by the student's advisory committee. This program must include 24 hours of formal courses (excluding EEES 8960 and EEES 8990) with a minimum of 19 hours in DES that must include EEES 5160, EEES 8250, two semesters of statistics (e.g., EEES 8400 and an advanced statistics course such as EEES 8650), EEES 8600, 8930-009 Departmental Seminar (1 hr. per semester), and the remaining courses selected with approval of the student's thesis committee taken at the 7000 level or above; all but EEES 8930 (seminars) must be taken for a letter grade (A–F). Additional credit hours will include EEES 8960 and/or EEES 8990, a maximum of 6 hours of which may be taken for a letter grade, and may also include other DES or non-DES courses that need not be taken for a letter grade. Within the first two years of study students must pass a written qualifying examination and an oral comprehensive examination and a defense of their research proposal.

All graduate students in the Ph.D. program are required to complete at least one semester of formal teaching-assistant experience before graduation. In addition, each student must:

1. submit a manuscript on their research to a scholarly, peer-reviewed journal;
2. give a presentation of their research at a professional conference; and
3. make an oral presentation on their research at a scholarly forum (an oral presentation at a professional conference would satisfy both latter requirements, but a poster presentation would not).

Finally, each student must prepare a dissertation consisting of a written report on original independent research conducted by the student under the supervision of their dissertation advisor (or co-advisors) and defend this dissertation before their advisory committee.

- PLO 1. Students will demonstrate an in-depth understanding of and the ability to communicate scientific information within an area of specialized study within the biological sciences.
- PLO 2. Students will demonstrate an ability to conduct experiments, collect and interpret data, and disseminate those data in written and verbal modalities.
- PLO 3. Students will demonstrate knowledge of their ethical responsibility when conducting research in terms of proper scientific conduct and the rights of human subjects.

PhD in Environmental Science

The doctoral degree in Environmental Sciences is awarded to a student who has demonstrated mastery in the field and a distinct ability to make substantial contributions to the field. The doctoral degree prepares students to enter research careers at academic institutions or state and federal natural resource agencies, environmental consulting firms, and nonprofit and non-government organizations (NGOs).

The doctoral degree provides students an interdisciplinary understanding of how the Earth's systems are interrelated and training to handle and interpret the wide variety of data that is incorporated into this type of research.

In general, work for the Ph.D. takes five years of study beyond the bachelor's degree. A substantial portion of this time is spent in independent research leading to a dissertation. Up to 30 hours from a master's degree program may apply as part of the student's doctoral program. Normally 90 credit hours of study beyond the bachelor's degree are required for the Ph.D.

Partial completion of this degree can include our Certificate in Hydrogeology and Groundwater Modeling.

This program must include 24 hours of formal courses (excluding EEES 8960 and EEES 8990) with a minimum of 19 hours in DES that must include:

Code	Title	Hours
EEES 5160	Advanced Environmental Data Management and Visualization	3
EEES 8250	Graduate Launch	1
EEES 8300	Integrated Environmental & Earth Systems	3
EEES 8400 or EEES 8500	Environmental Statistics	4
EEES 8930	Seminar In Ecology	1

The remaining courses are to be selected with approval of the student's thesis committee taken at the 7000 level or above; all but EEES 8930 (seminars) must be taken for a letter grade (A–F). Additional credit hours will include EEES 8960 and/or EEES 8990, a maximum of 6 hours of which may be taken for a letter grade and may also include other DES or non-DES courses that need not be taken for a letter grade. Within the first two years of study students must pass a written qualifying examination

and an oral comprehensive examination and a defense of their research proposal.

All graduate students in the Ph.D. program are required to complete at least one semester of formal teaching-assistant experience before graduation. In addition, each student must:

- submit a manuscript on their research to a scholarly, peer-reviewed journal;
- give a presentation of their research at a professional conference; and
- make an oral presentation on their research at a scholarly forum (an oral presentation at a professional conference would satisfy both latter requirements, but a poster presentation would not).

Finally, each student must prepare a dissertation consisting of a written report on original independent research conducted by the student under the supervision of their dissertation advisor (or co-advisors) and defend this dissertation before their advisory committee.

1. Committee makeup:

The committee will consist of at least five members including:

a. The dissertation adviser (must be a member of DES) who has primary responsibility for academic advising and directing the student's research and dissertation preparation.

b. At least two other full-time faculty members from DES.

c. At least one member from outside DES.

All members of the dissertation committee should hold a Ph.D. degree or the equivalent. The dissertation adviser must be a full member of UT's Graduate Faculty and the other UT committee members must have membership in the Graduate Faculty. Non-UT committee members must also apply for membership in the Graduate Faculty. Departures from the departmental committee membership requirements require prior approval by the department Graduate Affairs Committee.

2. Prepare a doctoral program Plan of Study form (POS) and secure departmental approval thereof prior to the first attempt at the written qualifying examination. The POS must be signed by the student, dissertation adviser, Department Graduate Advisor, College Dean, and Dean of the College of Graduate Studies.

3. Complete an individualized program of study in environmental sciences that is approved by the student's advisory committee. This program must include 24 hours of formal courses (excluding EEES 8960 and EEES 8990) with a minimum of 19 hours in DES that must include EEES 5160, EEES 8300, EEES 8400 or EEES 8500, EEES8250, 8930-009 Departmental Seminar (1 hr. per semester), and the remaining courses selected with approval of the student's thesis committee taken at the 7000 level or above; all but EEES 8930 (seminars) must be taken for a letter grade (A–F). Additional credit hours will include EEES 8960 and/or EEES 8990, a maximum of 6 hours of which may be taken for a letter grade, and may also include other DES or non-DES courses that need not be taken for a letter grade. Within the first two years of study students must pass a written qualifying examination and an oral comprehensive examination and a defense of their research proposal.

4. Pass a written qualifying examination designed to evaluate the student's capacity to complete his or her doctoral research. This examination may be administered at a time mutually agreed upon by the student and his or her dissertation committee, but should be successfully completed by the end of the student's second year in the program. Questions for the examination will be written by members of the student's dissertation committee who may solicit questions from other qualified scholars as deemed appropriate. Student performance will be judged satisfactory or unsatisfactory by a majority vote of this committee. Each committee member's vote can take into account any section of the exam, not only the set of questions posed by that committee member. The results of the evaluation process will be transmitted in writing to the student within ten working days from the time the exam is completed. Failed examinations may be retaken only once and the repeat is to be administered no later than the end of the fall semester during the academic year following the failure. Deviations from this protocol must be approved by the DES Graduate Affairs Committee at least six weeks prior to the examination.

5. Apply for admission to candidacy by the end of the student's second year in the program and prior to attempting the oral defense of the dissertation research proposal. For admission to candidacy the student must have a cumulative GPA of at least 3.0 (on a 0-4.0 scale) for all graduate courses and have successfully completed the written qualifying examination. It is the student's responsibility to initiate the application for candidacy. Any subsequent coursework must not drop the overall GPA below 3.0.

6. Write a dissertation proposal and pass an oral defense thereof by the end of the student's second year in the program. The dissertation proposal should focus on the student's research area and clearly present the hypothesis being tested, along with an appropriate discussion of background, significance and a detailed description of experimental design. It should be no more than 15 pages long, including figures and tables but not references. The defense of the proposal will include, but not be restricted to, questions about the proposal and the student's area of specialization and will be administered by the student's dissertation committee. The defense may be attempted twice and must be passed by the end of student's third year in the program.

7. File an approved Graduate Research Advisory (GRAD) Committee Approval and Assurances form with the College of Graduate Studies before dissertation research commences.

8. Complete the residency requirement of at least 18 hours of coursework taken over three consecutive semesters of graduate study at UT.

9. Complete at least one semester of teaching as an instructor in one or more of the laboratory courses in DES.

10. Meet with their dissertation committee at least once every academic year until graduation. The final committee meeting for the dissertation defense does not count as one of these meetings. It is the student's responsibility to initiate these meetings.

11. Prior to graduation, (1) submit a manuscript on their research to a scholarly, peer-reviewed journal (this manuscript cannot be a product

of previous MS work); (2) give either an oral or poster presentation on their research at a professional conference; and (3) make an oral presentation on their research at a scholarly forum [note that the same oral presentation may satisfy both items 2 and 3]. If the student is not the sole author of the journal manuscript or grant proposal, then he/she should be the first author and responsible for a majority of the writing. For the conference presentation, the student should be the presenter and not just a co-author on an abstract. It is not necessary for the manuscript to be accepted for publication or the grant to be funded at the time of graduation.

12. Apply for graduation before the deadline specified by the College of Graduate Studies.

13. Prepare a dissertation consisting of a written report on original independent research conducted by the student under the supervision of his or her advisory committee. The dissertation should be prepared in accordance with the format determined by the committee and consistent with the guidelines issued by the College of Graduate Studies. Each dissertation should contain a title page listing the student's advisory committee with the signatures of all committee members to certify the acceptability of the dissertation as partial fulfillment of the degree requirements.

14. Successfully pass an oral dissertation defense. In order for a defense to be scheduled, the student must complete the 'MS Thesis & PhD Dissertation Defense Request Form' at least one week prior to the defense date. This form requires the signed approval of all members of the dissertation committee as well as the departmental graduate adviser. Off-campus members may indicate their approval by email. By signing the form, committee members affirm that they have had an opportunity to read and comment upon the dissertation, and were provided with a copy of the dissertation draft that will be defended. Notice of the defense must be posted at least one week prior to its scheduled time. The student must present and successfully defend the dissertation before the dissertation committee. Faculty members and students are encouraged to attend, and the proceedings are open to the university community. The dissertation committee by majority vote must approve the student's dissertation and defense.

15. Submit one unbound copy of the dissertation signed by all committee members and a pdf file to DES by the last day of the semester in which the student wishes to graduate. The student must also submit an electronic copy via Ohio Link (see the College of Graduate Studies for instructions).

First Year		
First Term		**Hours**
EEES 5160	Advanced Environmental Data Management and Visualization	3
EEES 8250	Graduate Launch	1
EEES 8300	Integrated Environmental & Earth Systems	3
EEES 8930	Seminar In Ecology	1
EEES 8960	Doctoral Dissertation Research	1-15
	Hours	**9-23**
Second Term		
EEES 8400 or EEES 8500	Environmental Statistics or	4
Elective		3
EEES 8960	Doctoral Dissertation Research	1-15
EEES 8930	Seminar In Ecology	1
	Hours	**9-23**
Second Year		
First Term		
Elective		3
EEES 8960	Doctoral Dissertation Research	1-15
EEES 8930	Seminar In Ecology	1
	Hours	**5-19**
Second Term		
Elective		3
EEES 8960	Doctoral Dissertation Research	1-15
EEES 8930	Seminar In Ecology	1
	Hours	**5-19**
Third Year		
First Term		
EEES 8960	Doctoral Dissertation Research	1-15
EEES 8930	Seminar In Ecology	1
	Hours	**2-16**
Second Term		
EEES 8960	Doctoral Dissertation Research	1-15
EEES 8930	Seminar In Ecology	1
	Hours	**2-16**
Fourth Year		
First Term		
EEES 8960	Doctoral Dissertation Research	1-15
EEES 8930	Seminar In Ecology	1
	Hours	**2-16**
Second Term		
EEES 8960	Doctoral Dissertation Research	1-15
EEES 8930	Seminar In Ecology	1
	Hours	**2-16**
	Total Hours	**36-148**

- Students will demonstrate an in-depth understanding and the ability to communicate scientific information within an area of specialized study within the environmental sciences.
- Students will develop a proposal for their dissertation that evaluates the current state of science in their discipline and formulate novel questions for their research program.
- Students will implement a research program that will involve collecting and analyzing data, and interpreting results.
- Students will author and present their research in written and verbal modalities at a level suitable for publication or presentation in their discipline.
- Students will demonstrate ethical responsibility when conducting research in terms of proper scientific conduct and the rights of human subjects.

Department of Mathematics and Statistics

Ekaterina Shemyakova, Interim Chair
TBD, Associate Chair
Alessandro Arsie, Graduate Director and Graduate Mathematics Advisor
Biao Zhang, Graduate Statistics Advisor

For Graduate Admissions, please contact the department office

A full description of programs and requirements, with syllabi for exams, is available from the department office or on its Website (https://www.utoledo.edu/nsm/mathstats/). The paragraphs below represent a synopsis of the essential elements.

Mission

The mission of the Department of Mathematics and Statistics is to prepare students for careers or further academic programs in mathematics, statistics, actuarial science or data science. To that end we offer academic programs in these fields at bachelor's, master's and doctoral levels. Via these programs, students are enabled to establish careers in education, business, industry and government. Students at advanced levels graduate with ability to independently investigate mathematical and statistical problems at the forefront of our discipline. The department is also committed to fostering success for all students across the university by offering courses in mathematics that enhance their foundations in quantitative skills for the wide range of their collegiate coursework as well as critical life skills after they graduate. Finally, the department is committed to enhancing the university's research profile and capabilities by offering assistance in statistics and mathematics to research faculty and students across the campus.

General description

The Department of Mathematics and Statistics is a comprehensive academic unit offering a full range of programs across the disciplines and at all academic levels. We have 18 tenured/tenure-track faculty and 18 teaching faculty in the position of lecturer, along with several faculty in visiting and other part-time positions. We have graduate students at all levels numbering approximately 45. In addition to pure and applied mathematics and statistics at all levels, we also offer undergraduate programs in actuarial science, mathematics with computer science, and data science. Our Statistical Consulting Service provides assistance to researchers across the campus and the community. Our department is fully engaged with the Ohio department of Higher Education and the public institutions of higher education in Ohio in the Ohio Math Initiative. In the context of that initiative and other efforts, we are fully committed to fostering student success across the campus.

Degrees Offered

- MS in Mathematics (p. 224)
- PhD in Mathematics (p. 226)

MATH 5300 Linear Algebra I
[3 credit hours]
Theory of vector spaces and linear transformations, including such topics as matrices, determinants, inner products, eigenvalues and eigenvectors, and rational and Jordan canonical forms.
Term Offered: Fall

MATH 5330 Abstract Algebra I
[3 credit hours]
Arithmetic of the integers, unique factorization and modular arithmetic; group theory including normal subgroups, factor groups, cyclic groups, permutations, homomorphisms, the isomorphism theorems, abelian groups and p-groups.
Term Offered: Fall

MATH 5340 Abstract Algebra II
[3 credit hours]
Ring theory including integral domains, field of quotients, homomorphisms, ideals, Euclidean domains, polynomial rings, vector spaces, roots of polynomials and field extensions.
Prerequisites: MATH 5330 with a minimum grade of D-
Term Offered: Spring

MATH 5350 Applied Linear Algebra
[3 credit hours]
Matrices, systems of equations, vector spaces, linear transformations, determinants, eigenvalues and eigenvectors, generalized inverses, rank, numerical methods and applications to various areas of science.
Term Offered: Spring, Summer

MATH 5380 Discrete Structures And Analysis Algorithms
[3 credit hours]
Discrete mathematical structures for applications in computer science such as graph theory, combinatorics, groups theory, asymptotics, recurrence relations and analysis of algorithms.
Prerequisites: MATH 3320 with a minimum grade of D- or MATH 5330 with a minimum grade of D-
Term Offered: Fall

MATH 5450 Introduction To Topology I
[3 credit hours]
Metric spaces, topological spaces, continuous maps, bases and sub-bases, closure and interior operators, products, subspaces, sums, quotients, separation axioms, compactness and local compactness.
Term Offered: Fall

MATH 5460 Introduction To Topology II
[3 credit hours]
Connectedness and local connectedness, convergence, metrization, function spaces. The fundamental groups and its properties, covering spaces, classical applications, e.g. Jordan Curve Theorem, Fundamental Theorem of Algebra, Brouwer's Fixed Point Theorem.
Prerequisites: MATH 5450 with a minimum grade of D-
Term Offered: Spring

MATH 5540 Classical Differential Geometry I
[3 credit hours]
Smooth curves in Euclidean space including the Frenet formulae. Immersed surfaces with the Gauss map, principal curvatures and the fundamental forms. Special surfaces including ruled surfaces and minimal surfaces. Intrinsic Geometry including the Gauss Theorem Egregium.

MATH 5550 Classical Differential Geometry II
[3 credit hours]
Tensors, vector fields and the Cartan approach to surface theory, Bonnet's Theorem and the construction of surfaces via solutions of the Gauss Equation. Geodesics, parallel transport and Jacobi Fields. Theorems of a global nature such as Hilbert's Theorem or the Theorem of Hopf-Rinow.
Prerequisites: MATH 5540 with a minimum grade of D-

MATH 5600 Advanced Statistical Methods I
[3 credit hours]
Basics of descriptive statistics, study designs and statistical inference. Properties of, and assumptions required for, inference for means, variances, and proportions from one and two-sample paired and unpaired studies. Introduction to ANOVA with multiple comparisons and multiple regression. Model assessment and diagnostics. Statistical software will be employed. Opportunities to apply procedures to real data. Emphasis placed on the foundations to approaches in introductory statistics.
Term Offered: Fall

MATH 5610 Advanced Statistical Methods II
[3 credit hours]
Statistical/biostatistical concepts and methods. Broad subject categories that may be included are study design, longitudinal data analysis, survival analysis, logistic regression, random and mixed effects models. Other topics applicable to current statistical consulting projects, or related to modern data analytics, may be introduced. Appropriate statistical software will be employed.
Prerequisites: MATH 5600 with a minimum grade of C-
Term Offered: Spring

MATH 5620 Linear Statistical Models
[3 credit hours]
Multiple regression, analysis of variance and covariance, general linear models and model building for linear models. Experimental designs include one-way, randomized block, Latin square, factorial and nested designs.
Prerequisites: MATH 6650 with a minimum grade of D-
Term Offered: Spring

MATH 5630 Theory And Methods Of Sample Surveys
[3 credit hours]
The mathematical basis to estimation in various sampling contexts, including probability proportional to size sampling, stratified sampling, two-stage cluster sampling and double sampling, is developed.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 5640 Statistical Computing
[3 credit hours]
Modern statistical computing, including programming tools, modern programming methodologies, design of data structures and algorithms, numerical computing and graphics. Additional topics selected from simulation studies, inversion of probability integral transforms, rejection sampling, importance sampling, Monte Carlo integration, bootstrapping and optimization.
Term Offered: Fall

MATH 5680 Introduction To Theory Of Probability
[3 credit hours]
Probability spaces, random variables, probability distributions, moments and moment generating functions, limit theorems, transformations and sampling distributions.
Prerequisites: (MATH 3190 with a minimum grade of D- and MATH 5350 with a minimum grade of D-)
Term Offered: Summer, Fall

MATH 5690 Introduction To Mathematical Statistics
[3 credit hours]
Sampling distributions, point estimation, interval estimation, hypothesis testing, regression and analysis of variance.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Spring

MATH 5710 Methods Of Numerical Analysis I
[3 credit hours]
Floating point arithmetic; polynomial interpolation; numerical solution of nonlinear equations; Newton's method. Likely topics include: numerical differentiation and integration; solving systems of linear equations; Gaussian elimination; LU decomposition; Gauss-Seidel method.
Term Offered: Spring, Fall

MATH 5720 Methods Of Numerical Analysis II
[3 credit hours]
Likely topics include: Computation of eigenvalues and eigenvectors; solving systems of nonlinear equations; least squares approximations; rational approximations; cubic splines; fast Fourier transforms; numerical solutions to initial value problems; ordinary and partial differential equations.
Prerequisites: MATH 5710 with a minimum grade of D-
Term Offered: Spring

MATH 5780 Advanced Calculus
[3 credit hours]
Extrema for functions of one or more variables, Lagrange multipliers, indeterminate forms, inverse and implicit function theorems, uniform convergences, power series, transformations, Jacobians, multiple integrals.

MATH 5800 Ordinary Differential Equations
[3 credit hours]
Modern theory of differential equations; transforms and matrix methods; existence theorems and series solutions; and other selected topics.
Term Offered: Spring, Fall

MATH 5810 Partial Differential Equations
[3 credit hours]
First and second order equations; numerical methods; separation of variables; solutions of heat and wave equations using eigenfunction techniques; and other selected topics.
Term Offered: Spring

MATH 5820 Introduction To Real Analysis I
[3 credit hours]
The real number system; continuity and differentiability of functions; convergence of sequences and series; applications.
Term Offered: Fall

MATH 5830 Introduction To Real Analysis II
[3 credit hours]
Riemann Integral; limits of functions; elementary metric space theory including compactness, connectedness and completeness. Optional topics include differentiable functions on Rn; the Implicit and Inverse Function Theorems.
Prerequisites: MATH 5820 with a minimum grade of D-
Term Offered: Spring

MATH 5860 Calculus Of Variations And Optimal Control Theory I
[3 credit hours]
Conditions for an extreme (Euler's equations, Erdman corner conditions, conditions of Legendre, Jacobi and Weierstrass, fields of extremals, Hilbert's invariant integral);); Raleigh-Ritz method; isoperimetric problems; Lagrange, Mayer-Bolza problems. Recommended: MATH 5820.
Prerequisites: MATH 1890 with a minimum grade of D-
Term Offered: Fall

MATH 5880 Complex Variables
[3 credit hours]
Analytic functions; Cauchy's theorem; Taylor and Laurent series; residues; contour integrals; conformal mappings, analytic continuation and applications.
Term Offered: Spring, Summer

MATH 5970 Industrial Math Practicum
[1 credit hour]
Students must submit for approval by their adviser a report on the solution of a practical problem involving mathematics. The problem must be drawn from a company, university department of government unit.

MATH 5980 Topics In Mathematics
[3 credit hours]
Special topics in mathematics.
Term Offered: Spring, Summer, Fall

MATH 6300 Algebra I
[3 credit hours]
Group actions, Sylow's theorems, permutation groups, nilpotent and solvable groups, abelian groups, rings, unique factorization domains, fields.
Prerequisites: MATH 5340 with a minimum grade of D-
Term Offered: Fall

MATH 6310 Algebra II
[3 credit hours]
Field extensions, Galois theory, modules, Noetherian and Artinian rings, tensor products, primitive rings, semisimple rings and modules, the Wedderburn-Artin theorem.
Prerequisites: MATH 6300 with a minimum grade of D-
Term Offered: Spring

MATH 6400 Topology I
[3 credit hours]
Topological spaces, continuous functions, compactness, product spaces, Tychonov's theorem, quotient spaces, local compactness, homotopy theory, the fundamental group, covering spaces.
Prerequisites: MATH 4450 with a minimum grade of D- or MATH 5450 with a minimum grade of D- or MATH 7450 with a minimum grade of D-
Term Offered: Fall

MATH 6410 Topology II
[3 credit hours]
Homology theory, excision, homological algebra, the Brouwer fixed point theorem, cohomology, differential manifolds, orientation, tangent bundles, Sard's theorem, degree theory.
Prerequisites: MATH 6400 with a minimum grade of D-
Term Offered: Spring

MATH 6440 Differential Geometry I
[3 credit hours]
Introduction to differential geometry. Topics include differentiable manifolds, vector fields, tensor bundles, the Frobenius theorem, Stokes' theorem, Lie groups.
Prerequisites: MATH 6410 with a minimum grade of D-
Term Offered: Fall

MATH 6450 Differential Geometry II
[3 credit hours]
Topics include connections on manifolds, Riemannian geometry, the Gauss-Bonnet theorem. Further topics may include: homogeneous and symmetric spaces, minimal surfaces, Morse theory, comparison theory, vector and principal bundles.
Prerequisites: MATH 6440 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 6500 Ordinary Differential Equations
[3 credit hours]
Existence, uniqueness and dependence on initial conditions and parameter, nonlinear planar systems, linear systems, Floquet theory, second order equations, Sturm-Liouville theory.
Term Offered: Summer, Fall

MATH 6510 Partial Differential Equations
[3 credit hours]
First order quasi-linear systems of partial differential equations, boundary value problems for the heat and wave equation, Dirichlet problem for Laplace equation, fundamental solutions for Laplace, heat and wave equations.
Term Offered: Spring, Summer

MATH 6520 Dynamical Systems I
[3 credit hours]
Topic include the flow-box theorem, Poincare maps, attractors, w limit sets, Lyapunov stability, invariant submanifolds, Hamiltonian systems and symplectic manifolds.
Prerequisites: MATH 6500 with a minimum grade of D-

MATH 6530 Dynamical Systems II
[3 credit hours]
Topics may include local bifurcations of vector fields, global stability, ergodic theorems, integrable systems, symbolic dynamics, chaos theory.
Prerequisites: MATH 6520 with a minimum grade of D-

MATH 6600 Statistical Consulting
[1-5 credit hours]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience. May be repeated for credit.
Term Offered: Spring, Summer, Fall

MATH 6610 Statistical Consulting II
[3 credit hours]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience.
Term Offered: Spring

MATH 6620 Categorical Data Analysis
[3 credit hours]
Important methods and modeling techniques using generalized linear models and emphasizing loglinear and logit modeling.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 6630 Nonparametric Statistics
[3 credit hours]
Statistical methods based on counts and ranks; methods designed to be effective in the presence of contaminated data or error distribution misspecification.
Prerequisites: MATH 5680 with a minimum grade of C-
Term Offered: Spring, Fall

MATH 6640 Topics In Statistics
[3 credit hours]
Topics selected from an array of modern statistical methods such as survival analysis, nonlinear regression, Monte Carlo methods, etc.
Term Offered: Spring, Fall

MATH 6650 Statistical Inference
[3 credit hours]
Estimation, hypothesis testing, prediction, sufficient statistics, theory of estimation and hypothesis testing, simultaneous inference, decision theoretic models.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Fall

MATH 6670 Measure Theoretic Probability
[3 credit hours]
Real analysis, probability spaces and measures, random variables and distribution functions, independence, expectation, law of large numbers, central limit theorem, zero-one laws, characteristic functions, conditional expectations given a s-algebra, martingales.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Fall

MATH 6680 Theory Of Statistics
[3 credit hours]
Exponential families, sufficiency, completeness, optimality, equivariance, efficiency. Bayesian and minimax estimation. Unbiased and invariant tests, uniformly most powerful tests. Asymptotic properties for estimation and testing. Most accurate confidence intervals.
Prerequisites: MATH 5960 with a minimum grade of D- or (MATH 6650 with a minimum grade of D- and MATH 6670 with a minimum grade of D-)
Term Offered: Spring

MATH 6690 Multivariate Statistics
[3 credit hours]
Multivariate normal sampling distributions, T tests and MANOVA, tests on covariance matrices, simultaneous inference, discriminant analysis, principal components, cluster analysis and factor analysis.
Prerequisites: MATH 5690 with a minimum grade of D- or MATH 6650 with a minimum grade of D-
Term Offered: Spring

MATH 6730 Methods Of Mathematical Physics II
[3 credit hours]
Self-adjoint operators, special functions, orthogonal polynomials, partial differential equations and separation of variables, boundary value problems, Green¿s functions, integral equations, tensor analysis, metrics and curvature, calculus of variations, finite groups and group representations.
Prerequisites: MATH 6720 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 6800 Real Analysis I
[3 credit hours]
Completeness, connectedness and compactness in metric spaces, continuity and convergence, the Stone-Weierstrass Theorem, Lebesgue measure and integration on the real line, convergence theorems, Egorov's and Lusin's theorems, derivatives, functions of bounded variation.
Prerequisites: MATH 4830 with a minimum grade of D- or MATH 5830 with a minimum grade of D-
Term Offered: Fall

MATH 6810 Real Analysis II
[3 credit hours]
The Vitali covering theorem, absolutely continuous functions, Lebesgue-Stieltjes integration, the Riesz representation theorem , Banach spaces, Lp-spaces, abstract measures, the Radon-Nikodym theorem, measures on locally compact Hausdorff spaces.
Prerequisites: MATH 6800 with a minimum grade of D-
Term Offered: Spring

MATH 6820 Functional Analysis I
[3 credit hours]
Topics include Topological vector spaces, Banach spaces, convexity, the Hahn-Banch theorem, weak and strong topologies, Lp spaces and duality.
Prerequisites: MATH 6810 with a minimum grade of D-
Term Offered: Fall

MATH 6830 Functional Analysis II
[3 credit hours]
Topics include the Mackey-Ahrens Theorem, Banach algebras, spectra in Banach algebras, commutative Banach algebras, unbounded operators, the spectral theorem, topics in functional analysis.
Prerequisites: MATH 6820 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 6840 Complex Analysis I
[3 credit hours]
Elementary analytic functions, complex integration, the residue theorem, infinite sequences of analytic functions, Laurent expansions, entire functions.
Prerequisites: MATH 6800 with a minimum grade of D-
Term Offered: Fall

MATH 6850 Complex Analysis II
[3 credit hours]
Meromorphic functions, conformal mapping, harmonic functions and the dirichlet problem, the Riemann mapping theorem, monodromy, algebraic functions, Riemann surfaces, elliptic functions and the modular function.
Prerequisites: MATH 6840 with a minimum grade of D-
Term Offered: Spring

MATH 6870 Nonlinear Analysis I
[3 credit hours]
The instructor will select a subset among the following topics: Finite-dimensional degree theory, some applications to nonlinear equations. Preliminaries on Operator Theory and Differential Calculus in Normed Spaces; Topological Degree in Banach Spaces (Schuder fixed point theorem and Leray-Schauder theory) , non-resonance and topological degree, Lazer-Leach conditions and variations, variational techniques including Ekeland principle and its applications and Mountain Pass theorem, resonance and periodic solutions, Lusternik-Schnirelmann Theory, Poincare'-Birkhoff Theorem. Bifurcation theory: Morse lemma and its applications. Rabinowitz theorem and Krasnoselski theorem and its applications. Stability of solutions and number of global solutions to a nonlinear problem.
Prerequisites: MATH 6500 with a minimum grade of D- and MATH 6510 with a minimum grade of D-
Term Offered: Fall

MATH 6880 Nonlinear Analysis II
[3 credit hours]
The instructor will select a subset among the following topics: Geometric singular perturbation theory. Further topological methods: extensions of Leray-Schauder degree and applications to partial differential equations. Framed cobordism and stable cohomotopy theorem. Applications to existence of global solutions. Monotone operators and mini-max theorem. Generalized implicit function theorems, KAM and Conjugacy problems. Critical Points Theory and Hamiltonian Systems Topological Degree methods in Nonlinear Boundary Value Problems Normal forms, center manifold reduction and bifurcations in infinite dimensional dynamical systems.
Prerequisites: MATH 6500 with a minimum grade of D- and MATH 6510 with a minimum grade of D- and MATH 6870 with a minimum grade of D-
Term Offered: Spring

MATH 6930 Colloquium
[1 credit hour]
Lectures by visiting mathematicians and staff members on areas of current interest in mathematics.
Term Offered: Spring, Fall

MATH 6940 Proseminar
[1-5 credit hours]
Problems and techniques of teaching elementary college mathematics, supervised teaching, seminar in preparation methods.
Term Offered: Spring, Fall

MATH 6980 Topics In Mathematical Sciences
[3 credit hours]
Special topics in Mathematics or Statistics.
Term Offered: Spring, Summer, Fall

MATH 6990 Readings In Mathematics
[1-5 credit hours]
Readings in areas of Mathematics of mutual interest to the student and the professor.
Term Offered: Spring, Summer, Fall

MATH 7330 Abstract Algebra I
[3 credit hours]
Arithmetic of the integers, unique factorization and modular arithmetic; group theory including normal subgroups, factor groups, cyclic groups, permutations, homomorphisms, the isomorphism theorems, abelian groups and p-groups.
Term Offered: Fall

MATH 7340 Abstract Algebra II
[3 credit hours]
Ring theory including integral domains, field of quotients, homomorphisms, ideals, Euclidean domains, polynomial rings, vector spaces, roots of polynomials and field extensions.
Prerequisites: MATH 5330 with a minimum grade of D-
Term Offered: Spring

MATH 7350 Applied Linear Algebra
[3 credit hours]
Matrices, systems of equations, vector spaces, linear transformations, determinants, eigenvalues and eigenvectors, generalized inverses, rank, numerical methods and applications to various areas of science.
Term Offered: Spring, Summer

MATH 7450 Introduction To Topology I
[3 credit hours]
Metric spaces, topological spaces, continuous maps, bases and sub-bases, closure and interior operators, products, subspaces, sums, quotients, separation axioms, compactness and local compactness.
Term Offered: Fall

MATH 7460 Introduction To Topology II
[3 credit hours]
Connectedness and local connectedness, convergence, metrization, function spaces. The fundamental groups and its properties, covering spaces, classical applications, e.g. Jordan Curve Theorem, Fundamental Theorem of Algebra, Brouwer's Fixed Point Theorem.
Prerequisites: MATH 5450 with a minimum grade of D-
Term Offered: Spring

MATH 7540 Classical Differential Geometry I
[3 credit hours]
Smooth curves in Euclidean space including the Frenet formulae. Immersed surfaces with the Gauss map, principal curvatures and the fundamental forms. Special surfaces including ruled surfaces and minimal surfaces. Intrinsic Geometry including the Gauss Theorem Egregium.

MATH 7550 Classical Differential Geometry II
[3 credit hours]
Tensors, vector fields and the Cartan approach to surface theory, Bonnet's Theorem and the construction of surfaces via solutions of the Gauss Equation. Geodesics, parallel transport and Jacobi Fields. Theorems of a global nature such as Hilbert's Theorem or the Theorem of Hopf-Rinow.
Prerequisites: MATH 5540 with a minimum grade of D-

MATH 7600 Advanced Statistical Methods I
[3 credit hours]
Basics of descriptive statistics, study designs and statistical inference. Properties of, and assumptions required for, inference for means, variances, and proportions from one and two-sample paired and unpaired studies. Introduction to ANOVA with multiple comparisons and logistic and multiple regression. Model assessment and diagnostics. Statistical software will be employed. Opportunities to apply procedures to real data. Emphasis placed on the foundations to approaches in introductory statistics.
Term Offered: Fall

MATH 7610 Advanced Statistical Methods II
[3 credit hours]
Statistical/biostatistical concepts and methods. Broad subject categories that may be included are study design, longitudinal data analysis, survival analysis, logistic regression, random and mixed effects models and Bayesian Statistics. Other topics applicable to current statistical consulting projects, or related to modern data analytics, may be introduced. Appropriate statistical software will be employed.
Prerequisites: MATH 5600 with a minimum grade of C-
Term Offered: Spring

MATH 7620 Linear Statistical Models
[3 credit hours]
Multiple regression, analysis of variance and covariance, general linear models and model building for linear models. Experimental designs include one-way, randomized block, Latin square, factorial and nested designs.
Prerequisites: MATH 6650 with a minimum grade of D-
Term Offered: Spring

MATH 7630 Theory And Methods Of Sample Surveys
[3 credit hours]
The mathematical basis to estimation in various sampling contexts, including probability proportional to size sampling, stratified sampling, two-stage cluster sampling and double sampling, is developed.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Spring

MATH 7640 Statistical Computing
[3 credit hours]
Modern statistical computing, including programming tools, modern programming methodologies, design of data structures and algorithms, numerical computing and graphics. Additional topics selected from simulation studies, inversion of probability integral transforms, rejection sampling, importance sampling, Monte Carlo integration, bootstrapping and optimization.
Term Offered: Fall

MATH 7680 Introduction To Theory Of Probability
[3 credit hours]
Probability spaces, random variables, probability distributions, moments and moment generating functions, limit theorems, transformations and sampling distributions.
Prerequisites: MATH 3190 with a minimum grade of D-
Term Offered: Fall

MATH 7690 Introduction To Mathematical Statistics
[3 credit hours]
Sampling distributions, point estimation, interval estimation, hypothesis testing, regression and analysis of variance.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Spring

MATH 7710 Methods Of Numerical Analysis I
[3 credit hours]
Floating point arithmetic; polynomial interpolation; numerical solution of nonlinear equations; Newton's method. Likely topics include: numerical differentiation and integration; solving systems of linear equations; Gaussian elimination; LU decomposition; Gauss-Seidel method.
Term Offered: Fall

MATH 7720 Methods Of Numerical Analysis II
[3 credit hours]
Likely topics include: Computation of eigenvalues and eigenvectors; solving systems of nonlinear equations; least squares approximations; rational approximations; cubic splines; fast Fourier transforms; numerical solutions to initial value problems; ordinary and partial differential equations.
Prerequisites: MATH 5710 with a minimum grade of D-
Term Offered: Spring

MATH 7800 Ordinary Differential Equations
[3 credit hours]
Modern theory of differential equations; transforms and matrix methods; existence theorems and series solutions; and other selected topics.
Term Offered: Spring, Fall

MATH 7810 Partial Differential Equations
[3 credit hours]
First and second order equations; numerical methods; separation of variables; solutions of heat and wave equations using eigenfunction techniques; and other selected topics.
Term Offered: Spring

MATH 7820 Introduction To Real Analysis I
[3 credit hours]
The real number system; continuity and differentiability of functions; convergence of sequences and series; applications.
Term Offered: Fall

MATH 7830 Introduction To Real Analysis II
[3 credit hours]
Riemann Integral; limits of functions; elementary metric space theory including compactness, connectedness and completeness. Optional topics include differentiable functions on Rn; the Implicit and Inverse Function Theorems.
Prerequisites: MATH 5820 with a minimum grade of D-
Term Offered: Spring

MATH 7880 Complex Variables
[3 credit hours]
Analytic functions; Cauchy's theorem; Taylor and Laurent series; residues; contour integrals; conformal mappings, analytic continuation and applications.
Term Offered: Spring, Summer

MATH 7980 Topics In Mathematics
[3 credit hours]
Special topics in mathematics.

MATH 8300 Algebra I
[3 credit hours]
Group actions, Sylow's theorems, permutation groups, nelpotent and solvable groups, abelian groups, rings, unique factorization domains, fields.
Prerequisites: MATH 5340 with a minimum grade of D- or MATH 7340 with a minimum grade of D-
Term Offered: Fall

MATH 8310 Algebra II
[3 credit hours]
Field extensions, Galois theory, modules, Noetherian and Artinian rings, tensor products, primitive rings, semisimple rings, and modules, the Wedderburn-Artin theorem.
Prerequisites: MATH 6300 with a minimum grade of D- or MATH 8300 with a minimum grade of D-
Term Offered: Spring

MATH 8400 Topology I
[3 credit hours]
Topological spaces, continuous functions, compactness, product spaces, Tychonov's theorem, quotient spaces, local compactness, homotopy theory, the fundamental group, covering spaces.
Prerequisites: MATH 7450 with a minimum grade of D- or MATH 4450 with a minimum grade of D- or MATH 5450 with a minimum grade of D-
Term Offered: Fall

MATH 8410 Topology II
[3 credit hours]
Homology theory, excision, homological algebra, the Brouwer fixed point theorem, cohomology, differential manifolds, orientation, tangent bundles, Sard' theorem, degree theory.
Prerequisites: MATH 6400 with a minimum grade of D- or MATH 8400 with a minimum grade of D-
Term Offered: Spring

MATH 8440 Differential Geometry I
[3 credit hours]
Introduction to differential geometry. Topics include differentiable manifolds, vector fields, tensor bundles, the Frobenius theorem, Stokes' theorem, Lie groups.
Prerequisites: MATH 6410 with a minimum grade of D- or MATH 8410 with a minimum grade of D-
Term Offered: Fall

MATH 8450 Differential Geometry II
[3 credit hours]
Topics include connections on manifolds, Riemannian geometry, the Gauss-Bonnet theorem. Further topics may include: homogeneous and symmetric spaces, minimal surfaces, Morse theory, comparison theory, vector and principal bundles.
Prerequisites: MATH 6440 with a minimum grade of D- or MATH 8440 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 8500 Ordinary Differential Equations
[3 credit hours]
Existence, uniqueness and dependence on initial conditions and parameter, nonlinear planar systems, linear systems, Floquet theory, second order equations, Sturm-Liouville theory.
Term Offered: Summer, Fall

MATH 8510 Partial Differential Equations
[3 credit hours]
First order quasi-linear systems of partial differential equations, boundary value problems for the heat and wave equation, Dirichlet problem for Laplace equation, fundamental solutions for Laplace, heat and wave equations.
Term Offered: Spring

MATH 8520 Dynamical Systems I
[3 credit hours]
Topic include the flow-box theorem, Poincare maps, attractors, w-limit sets, Lyapunov stability, invariant submanifolds, Hamiltonian systems and symplectic manifolds.
Prerequisites: MATH 6500 with a minimum grade of D- or MATH 8500 with a minimum grade of D-

MATH 8530 Dynamical Systems II
[3 credit hours]
Topics may include local bifurcations of vector fields, global stability, ergodic theorems, integrable systems, symbolic dynamics, chaos theory.
Prerequisites: MATH 6520 with a minimum grade of D- or MATH 8520 with a minimum grade of D-

MATH 8540 Partial Differential Equations I
[3 credit hours]
Possible topics may include: the Cauchy-Kovalevskaya Theorem, nonlinear partial differential equations of the first order, theory of Sobolev spaces, linear second order PDE's of elliptic, hyperbolic and parabolic type.
Prerequisites: MATH 6510 with a minimum grade of D- or MATH 8510 with a minimum grade of D-
Term Offered: Fall

MATH 8550 Partial Differential Equations II
[3 credit hours]
Selected topics in Partial Differential Equations of current interest emphasizing nonlinear theory. Possible topics may include: Minimal surfaces, applications of the Hopf maximum principle, free boundary value problems, harmonic maps, geometric evolution equations and the Navier-Stokes equation.
Prerequisites: MATH 6540 with a minimum grade of D- or MATH 8540 with a minimum grade of D-
Term Offered: Spring

MATH 8600 Statistical Consulting
[1-5 credit hours]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience. May be repeated for credit.
Term Offered: Spring, Summer, Fall

MATH 8610 Statistical Consulting II
[2 credit hours]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience.
Term Offered: Spring

MATH 8620 Categorical Data Analysis
[3 credit hours]
Important methods and modeling techniques using generalized linear models and emphasizing loglinear and logit modeling.
Prerequisites: MATH 5680 with a minimum grade of D- or MATH 7680 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 8630 Nonparametric Statistics
[3 credit hours]
Statistical methods based on counts and ranks; methods designed to be effective in the presence of contaminated data or error distribution misspecification.
Prerequisites: MATH 5680 with a minimum grade of C- or MATH 7680 with a minimum grade of C-
Term Offered: Spring, Fall

MATH 8640 Topics In Statistics
[3 credit hours]
Topics selected from an array of modern statistical methods such as survival analysis, nonlinear regression, Monte Carlo methods, etc.
Term Offered: Spring, Fall

MATH 8650 Statistical Inference
[3 credit hours]
Estimation, hypothesis testing, prediction, sufficient statistics, theory of estimation and hypothesis testing, simultaneous inference, decision theoretic models.
Prerequisites: MATH 5680 with a minimum grade of D- or MATH 7680 with a minimum grade of D-
Term Offered: Fall

MATH 8670 Measure Theoretic Probability
[3 credit hours]
Real analysis, probability spaces and measures, random variables and distribution functions, independence, expectation, law of large numbers, central limit theorem, zero-one laws, characteristic functions, conditional expectations given a s-algebra, martingales.
Prerequisites: MATH 5680 with a minimum grade of D- or MATH 7680 with a minimum grade of D-
Term Offered: Fall

MATH 8680 Theory Of Statistics
[3 credit hours]
Exponential families, sufficiency, completeness, optimality, equivariance, efficiency. Bayesian and minimax estimation. Unbiased and invariant tests, uniformly most powerful tests. Asymptotic properties for estimation and testing. Most accurate confidence intervals.
Term Offered: Spring

MATH 8690 Multivariate Statistics
[3 credit hours]
Multivariate normal sampling distributions, T tests and MANOVA, tests on covariance matrices, simultaneous inference, discriminant analysis, principal components, cluster analysis and factor analysis.
Prerequisites: MATH 5690 with a minimum grade of D- or MATH 6650 with a minimum grade of D- or MATH 8650 with a minimum grade of D-
Term Offered: Spring

MATH 8730 Methods Of Mathematical Physics II
[3 credit hours]
Self-adjoint operators, special functions, orthogonal polynomials, partial differential equations and separation of variables, boundary value problems, Green¿s functions, integral equations, tensor analysis, metrics and curvature, calculus of variations, finite groups and group representations.
Prerequisites: MATH 6720 with a minimum grade of D- or MATH 8720 with a minimum grade of D-

MATH 8800 Real Analysis I
[3 credit hours]
Completeness, connectedness and compactness in metric spaces, continuity and convergence, Stone-Weierstrass Theorem, Lebesgue measure and integration on the real line, convergence theorems, Egorov's and Lusin's theorems, derivatives, functions of bounded variation.
Prerequisites: MATH 7830 with a minimum grade of D- or MATH 4830 with a minimum grade of D- or MATH 5830 with a minimum grade of D-
Term Offered: Fall

MATH 8810 Real Analysis II
[3 credit hours]
The Vitali covering theorem, absolutely continuous functions, Lebesgue-Stieltjes integration, the Reisz representation theorem, Banach spaces, Lp-spaces, abstract measures, the Radon-Nikodym theorem, measures on locally compact Hausdorff spaces.
Prerequisites: MATH 6800 with a minimum grade of D- or MATH 8800 with a minimum grade of D-
Term Offered: Spring

MATH 8820 Functional Analysis I
[3 credit hours]
Topics include Topological vector spaces, Banach spaces, convexity, the Hahn-Banach theorem, weak and strong topologies, Lp spaces and duality.
Prerequisites: MATH 6810 with a minimum grade of D- or MATH 8810 with a minimum grade of D-
Term Offered: Fall

MATH 8830 Functional Analysis II
[3 credit hours]
Topics include the Mackey-Ahrens Theorem, Banach algebras, spectra in Banach algebras, commutative Banach algebras, unbounded operators, the spectral theorem, topics in functional analysis.
Prerequisites: MATH 6820 with a minimum grade of D- or MATH 8820 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 8840 Complex Analysis I
[3 credit hours]
Elementary analytic functions, complex integration, the residue theorem, infinite sequences of analytic functions, Laurent expansions, entire functions.
Prerequisites: MATH 6800 with a minimum grade of D- or MATH 8800 with a minimum grade of D-
Term Offered: Fall

MATH 8850 Complex Analysis II
[3 credit hours]
Meromorphic functions, conformal mapping, harmonic functions and the Dirichlet problem, the Riemann mapping theorem, monodromy, algebraic functions, Riemann surfaces, elliptic functions and the modular function.
Prerequisites: MATH 6840 with a minimum grade of D- or MATH 8840 with a minimum grade of D-
Term Offered: Spring

MATH 8860 Nonlinear Analysis I
[3 credit hours]
Topological Degree in Banach Spaces (Schuder fixed point theorem and Leray-Schauder theory) , non-resonance and topological degree, Lazer-Leach conditions and variations, variational techniques including Ekeland principle and its applications and Mountain Pass theorem, resonance and periodic solutions, Lusternik-Schnirelmann Theory, Poincare'-Birkhoff Theorem. Bifurcation theory: Morse lemma and its applications. Rabinowitz theorem and Krasnoselski theorem and its applications. Stability of solutions and number of global solutions to a nonlinear problem.
Prerequisites: MATH 8500 with a minimum grade of D- and MATH 8510 with a minimum grade of D-
Term Offered: Fall

MATH 8880 Nonlinear Analysis II
[3 credit hours]
The instructor based in his/her interests and on the interests and needs of the students attending the course will select a subset among the following topics: Geometric singular perturbation theory Further topological methods: extensions of Leray-Schauder degree and applications to partial differential equations. Framed cobordism and stable cohomotopy theorem. Applications to existence of global solutions. Monotone operators and mini-max theorem. Generalized implicit function theorems, KAM and Conjugacy problems. Critical Points Theory and Hamiltonian Systems.
Prerequisites: MATH 8500 with a minimum grade of D- and MATH 8510 with a minimum grade of D- and MATH 8870 with a minimum grade of D-
Term Offered: Spring

MATH 8890 Problems In Algebra, Topology, And Analysis
[1 credit hour]
Practicum in solving problems in graduate algebra, topology and analysis. Supplements 6300-10, 6400-10 and 6800-10 and prepares students for doctoral qualifying examination.

MATH 8930 Colloquium
[1 credit hour]
Lectures by visiting mathematicians and staff members on areas of current interest in mathematics.
Term Offered: Spring, Fall

MATH 8940 Proseminar
[1-5 credit hours]
Problems and techniques of teaching elementary college mathematics, supervised teaching, seminar in preparation methods.
Term Offered: Spring, Summer, Fall

MATH 8960 Dissertation
[1-6 credit hours]
Student works toward their dissertation.
Term Offered: Spring, Summer, Fall

MATH 8980 Topics In Mathematical Sciences
[3 credit hours]
Special topics in Mathematics or Statistics.
Term Offered: Spring, Summer, Fall

MATH 8990 Readings In Mathematics
[1-5 credit hours]
Readings in areas of Mathematics of mutual interest to the student and the professor.
Term Offered: Spring, Summer, Fall

MS in Mathematics

The **M.S. program in Applied Mathematics** offers students a rigorous introduction to the fundamental tools of applied mathematics, with particular emphasis on differential equations and numerical analysis. The program requires 30 semester hours of course work that includes year-long courses in real analysis, numerical analysis, and differential equations and a semester course in complex analysis. Elective courses can be chosen from graduate courses in applied areas such as linear, nonlinear and dynamic programming, convex analysis, calculus of variations, applied functional analysis, and optimal control. A major component of this track is a project report (to serve as a thesis) which contains a solution to a practical "real-life" problem drawn from a company, university department or government unit.

The **M.S. Program in Pure Mathematics** is designed to provide a comprehensive introduction to the fundamental concepts of modern mathematics and is appropriate for students who wish to pursue a career teaching at the community or junior college level or for those who intend to enter a doctoral program. The degree requires 30 semester hours of coursework that must include the two-semester introductory courses in algebra, topology, and real analysis and one semester of complex analysis. In addition, students are required to complete one upper-level sequence in algebra, topology, differential geometry, differential equations, real or complex analysis. Electives can be chosen from other graduate-level courses in mathematics.

The **M.S. program in Statistics** gives students training in methodology of applied statistics and also provides a solid foundation in statistical theory. Students' skills in applied statistics are developed through project-oriented courses, statistical computing emphasizing *S+* and *SAS*, and faculty-supervised experience in the Department's statistical consulting service. Through the statistical consulting service, students gain first-hand experience assisting with the statistical analysis of problems that come from local institutions such as the UToledo College of Medicine and The UToledo Center for Applied Pharmacology and from local industries. The program requires 33 semester hours of courses ***offered as on-campus classroom courses and in distance-learning format.*** Among the required courses are applications of statistics, statistical inference, linear statistical models, multivariate analysis, statistical computing, non-parametric statistics, categorical data analysis, statistical consulting, and sample survey methods and theory.

Mathematics - Applied Mathematics Concentration, MS

The degree of Master of Science – **Applied Mathematics Concentration**: To obtain the degree of Master of Science in the applied mathematics option, the student must complete a minimum of 30 semester hours of graduate credit and meet the following requirements:

Code	Title	Hours
MATH 5710 & MATH 5720	Methods Of Numerical Analysis I and Methods Of Numerical Analysis II	6
MATH 5820 & MATH 5830	Introduction To Real Analysis I and Introduction To Real Analysis II	6
MATH 6500 & MATH 6510	Ordinary Differential Equations and Partial Differential Equations	6
MATH 5880	Complex Variables	3
Select three of the following:		9
MATH 6520	Dynamical Systems I	
MATH 6530	Dynamical Systems II	
MATH 6720		
MATH 5380	Discrete Structures And Analysis Algorithms	
MATH 5540	Classical Differential Geometry I	
MATH 5550	Classical Differential Geometry II	
MATH 5800	Ordinary Differential Equations	
MATH 5810	Partial Differential Equations	
MATH 5330	Abstract Algebra I	
MATH 5340	Abstract Algebra II	
MATH 5680	Introduction To Theory Of Probability	
MATH 5690	Introduction To Mathematical Statistics	
MATH 5860	Calculus Of Variations And Optimal Control Theory I	

The student must pass a two-part comprehensive examination or submit and defend a master's thesis. For distance learning students, the exams will be administered remotely and will require access to a remote site or the internet and a computer with video and audio capabilities.

Total Hours	**30**

COMBINED BACHELOR'S TO MASTER'S - BS to MS in Mathematics

Undergraduate students accepted to the BS to MS in Mathematics program option will be admitted to the MS in Mathematics with a concentration in Applied Mathematics and allowed to complete up to three graduate level classes (nine credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in to the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) MATH 5710 Methods Of Numerical Analysis I, MATH 5720 Methods Of Numerical Analysis II, MATH 5820 Introduction to Real Analysis I, MATH 5830 Introduction to Real Analysis II, MATH 5880 Introduction to Complex Variables, MATH 5800 Ordinary Differential Equations, MATH 5810 Partial Differential Equations, may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

Mathematics -Pure Mathematics Concentration, MS

To obtain the degree of Master of Sciences - **Pure Mathematics Concentration,** students must complete a minimum of 30 semester hours of graduate credit and meet the following requirements:

Code	Title	Hours
MATH 5330 & MATH 5340	Abstract Algebra I and Abstract Algebra II	6
MATH 5820 & MATH 5830	Introduction To Real Analysis I and Introduction To Real Analysis II	6
MATH 5450 & MATH 5460	Introduction To Topology I and Introduction To Topology II	6
MATH 5880	Complex Variables	3
Select one of the following:		6
MATH 6300 & MATH 6310	Algebra I and Algebra II	
MATH 6400 & MATH 6410	Topology I and Topology II	
MATH 6500 & MATH 6510	Ordinary Differential Equations and Partial Differential Equations	
MATH 6440 & MATH 6450	Differential Geometry I and Differential Geometry II	
MATH 6800 & MATH 6810	Real Analysis I and Real Analysis II	
MATH 6840 & MATH 6850	Complex Analysis I and Complex Analysis II	
Select one of the following:		3
MATH 5540	Classical Differential Geometry I	
MATH 5800	Ordinary Differential Equations	
MATH 5810	Partial Differential Equations	
MATH 5860	Calculus Of Variations And Optimal Control Theory I	
MATH 5710	Methods Of Numerical Analysis I	
Any course at the 6000 level listed above		

The student must pass a three-part comprehensive examination or write a master's thesis. If a thesis is elected, the student must take an oral examination on the general area of the thesis. For distance learning students, the exams will be administered remotely and require a remote test site or access to the internet and a computer with video and audio capabilities.

Total Hours	**30**

COMBINED BACHELOR'S TO MASTER'S - BS to MS in Mathematics

Undergraduate students accepted to the BS to MS in Mathematics program option will be admitted to the MS in Mathematics and allowed to complete up to three graduate-level classes (nine credit hours) during

their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue into the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to the completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) MATH 5330 Abstract Algebra I, MATH 5340 Abstract Algebra II, MATH 5450 Introduction to Topology I, MATH 5460 Introduction to Topology II, MATH 5820 Introduction to Real Analysis I, MATH 5830 Introduction to Real Analysis II, MATH 5880 Introduction to Complex Variables, may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

Mathematics - Statistics Concentration, MS

The degree of Master of Science - **Statistics Concentration**: To obtain the degree of Master of Science in the statistics option, the student must complete a minimum of 33 semester hours of graduate credit and meet the following requirements:

Code	Title	Hours
MATH 5680	Introduction To Theory Of Probability	3
MATH 5690	Introduction To Mathematical Statistics	3
MATH 5600	Advanced Statistical Methods I	3
MATH 5610	Advanced Statistical Methods II	3
MATH 5620	Linear Statistical Models	3
MATH 5630	Theory And Methods Of Sample Surveys	3
MATH 5640	Statistical Computing	3
MATH 6620	Categorical Data Analysis	3
MATH 6630	Nonparametric Statistics	3
MATH 6650	Statistical Inference	3
MATH 6690	Multivariate Statistics	3
Pass a two-part comprehensive examination, one part in probability and statistical theory and one part in applied statistics. For distance learning students, the exams will be administered remotely and will require access to a remote testing site or to the internet and a computer with video and audio capabilities.		
Total Hours		**33**

COMBINED BACHELORS'S TO MASTER's - BS to MS in Mathematics

Undergraduate students accepted to the BS to MS in Mathematics program option will be admitted to the MS in Mathematics with a concentration in Statistics and allowed to complete up to three graduate level classes (nine credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in to the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2)MATH 5600 Advanced Statistics Methods I, MATH 5610 Advanced Statistical Methods II, MATH 5620 Linear Statistics Models, MATH 5640 Statistical Computing, MATH 5680 Introduction to the Theory of Probability, MATH 5690 Introduction to Mathematics Statistics may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

- Students will judge the validity of rigorous mathematical arguments.
- Students will explain mathematical ideas and arguments.
- Students will discuss mathematical proofs.
- Students will create mathematical arguments.

PhD in Mathematics

The main goal of the **Ph.D. program** is to train mathematicians and statisticians who intend to make research in these areas their life work. Since 1967 when the University of Toledo joined the Ohio university system, the Department of Mathematics and Statistics has offered a strong doctoral program and its graduates now occupy academic positions in colleges and universities around the world.

The defining stage of the Ph.D. program is the writing and defense of a dissertation, demonstrating the student's ability to independently attack and solve in an original manner a significant mathematical or statistical problem. No firm timetable can be given for completion of this stage but generally, it can be expected to take two to three years. Possible areas for thesis research in the Department include group theory, non-commutative algebra and representation theory, operator theory, harmonic analysis, several complex variables, partial differential equations, dynamical systems, differential geometry, mathematical physics, mathematical biology, geometric topology, control theory and statistics.. The number of credit hours required is a minimum of 90, 60 if entering with a master's degree in the field.

The PhD program in Mathematics concentrations include:

- Applied Mathematics
- Pure Mathematics
- Statistics

The PhD program in Mathematics concentrations include:

- Applied Mathematics (p. 227)
- Pure Mathematics (p. 227)
- Statistics (p. 227)

Applied Mathematics

The broad requirements for the doctorate in **applied mathematics concentration** are as follows:

1. A student must pass a qualifying examination within two years of entering the program. Mathematics students must pass two topics chosen from algebra, topology, differential equations and real analysis. For statistics students, the two topics must be measure-theoretic probability-theory of statistics and real analysis.

2. A minimum of 90 hours of graduate credit must be completed; 60 hours if the student holds a master's degree upon entry. Colloquium (6930) and Proseminar (6940) are excluded. Pure Mathematics students must complete two semester sequences at the 6000 level in algebra, topology, real analysis (first year sequences) while Applied Mathematics students must complete two semester sequences at the 6000 level in differential equations, real analysis and one between topology and algebra (first year sequences). Statistics students must complete measure-theoretic probability, theory of statistics, and other 6000-level courses selected in consultation with the Statistics graduate advisor. No more that 36 credit hours of Dissertation (8960) shall be counted toward the total.

4. In addition to the first-year sequences, Mathematic students (Pure and Applied) must successfully complete three catalog-listed 6000/8000 year-long sequences excluding (6/8720,6/8730).

4. The student must pass an oral examination in the general area of the intended thesis research within one year of passing the qualifying examination.

5. All doctoral students are expected to spend two consecutive semesters in supervised teaching. Enrollment in the Proseminar is mandatory every semester if credit hour limitations allow it.

6. The student must write a Ph.D. doctoral dissertation under the direction of a faculty member. Before completing the dissertation, the student must report on it in an open seminar. An outside examiner must approve the completed dissertation, and the student must defend it before a faculty committee appointed for that purpose

Pure Mathematics

The broad requirements for the doctorate in mathematics with a **pure mathematics concentration** are as follows:

1. A student must pass a qualifying examination within two years of entering the program. Mathematics students must pass two topics chosen from algebra, topology, differential equations and real analysis. For statistics students, the two topics must be measure-theoretic probability-theory of statistics and real analysis.

2. A minimum of 90 hours of graduate credit must be completed; 60 hours if the student holds a master's degree upon entry. Colloquium (6930) and Proseminar (6940) are excluded. Pure Mathematics students must complete two semester sequences at the 6000 level in algebra, topology, real analysis (first year sequences) while Applied Mathematics students must complete two semester sequences at the 6000 level in differential equations, real analysis and one between topology and algebra (first year sequences). Statistics students must complete measure-theoretic probability, theory of statistics, and other 6000-level courses selected in consultation with the Statistics graduate advisor. No more than 36 credit hours of Dissertation (8960) can be applied toward the total.

3. In addition to the first-year sequences, Mathematic students (Pure and Applied) must successfully complete three catalog-listed 6000/8000 year-long sequences excluding (6/8720,6/8730).

4. The student must pass an oral examination in the general area of the intended thesis research within one year of passing the qualifying examination.

5. All doctoral students are expected to spend two consecutive semesters in supervised teaching. Enrollment in the Proseminar is mandatory every semester if credit hour limitations allow it.

6. The student must write a Ph.D. doctoral dissertation under the direction of a faculty member. Before completing the dissertation, the student must report on it in an open seminar. An outside examiner must approve the completed dissertation, and the student must defend it before a faculty committee appointed for that purpose

Statistics

The broad requirements for the doctorate in mathematics with a **statistics concentrations** are as follows:

1. A student must pass a qualifying examination within two years of entering the program. Mathematics students must pass two topics chosen from algebra, topology, differential equations and real analysis. For statistics students, the two topics must be measure-theoretic probability-theory of statistics and real analysis.

2. A minimum of 90 hours of graduate credit must be completed; 60 hours if the student holds a master's degree upon entry. Colloquium (6930) and Proseminar (6940) are excluded. Pure Mathematics students must complete two semester sequences at the 6000 level in algebra, topology, real analysis (first year sequences) while Applied Mathematics students must complete two semester sequences at the 6000 level in differential equations, real analysis and one between topology and algebra (first year sequences). Statistics students must complete measure-theoretic probability, theory of statistics, and other 6000-level courses selected in consultation with the Statistics graduate advisor. No more than 36 credit hours of Dissertation (8960) can be applied toward the total.

3. In addition to the first-year sequences, Mathematic students (Pure and Applied) must successfully complete three catalog-listed 6000/8000 year-long sequences excluding (6/8720,6/8730).

4. The student must pass an oral examination in the general area of the intended thesis research within one year of passing the qualifying examination.

5. All doctoral students are expected to spend two consecutive semesters in supervised teaching. Enrollment in the Proseminar is mandatory every semester if credit hour limitations allow it.

6. The student must write a Ph.D. doctoral dissertation under the direction of a faculty member. Before completing the dissertation, the student must report on it in an open seminar. An outside examiner must approve the completed dissertation, and the student must defend it before a faculty committee appointed for that purpose

- PLO. 1 Students will explain research papers in mathematics.
- PLO 2. Students will formulate a research problem in mathematics.
- PLO 3. Students will create independent research in a specific mathematical area.
- PLO 4. Students will describe and illustrate, both written and orally, the results of their research.

Department of Molecular, Cellular and Developmental Biology

Song-Tao Liu, Chair
William Taylor, Associate Chair
Tomer Avidor-Reiss, graduate adviser

Mission

The Department of Molecular, Cellular, and Developmental Biology strives to improve the human condition in the region and the world through cutting-edge molecular and cellular biology research, high quality instruction and experiential learning for undergraduates pursuing medical and scientific careers, and intensive personalized training for graduate students pursuing scientific careers in academia, industry, and beyond.

General description

The department offers M.S. and Ph.D. degrees in biology, along with B.S. and B.A. degrees in biology, B.S. in Neuroscience, and a B.S. in Medical Laboratory Science. Faculty research interests are concentrated in cellular architecture and dynamics, cancer biology, immunology, neuroscience, fertility, development, and plant science, united by a common interest in discovering fundamental molecular mechanisms. Coursework at both graduate and undergraduate levels emphasizes cell biology, molecular biology, genetics and related areas.

Accreditations

Our Medical Laboratory Science training program currently is fully accredited under National Accrediting Agency for Clinical Laboratory Sciences (NAACLS).

- MS in Biology - Cell and Molecular Biology Concentration (p. 230)
- PhD in Biology - Cell And Molecular Biology Concentration (p. 232)

BIOL 5030 Advanced Microbiology
[3 credit hours]
Lectures on the principles of modern microbiology and virology, including metabolism, growth, cellular morphology, genetics and host parasite relationships. Bacterial and viral diseases will be illustrated.
Term Offered: Spring

BIOL 5040 Advanced Microbiology Laboratory
[1 credit hour]
Laboratories utilizing basic microbiological techniques and illustrating principles of growth, identification and genetics of microbes.
Corequisites: BIOL 5030
Term Offered: Spring

BIOL 5050 Advanced Immunology
[3 credit hours]
The development, genetics and physiology of the immune response.
Term Offered: Spring, Fall

BIOL 5230 Advanced Comparative Animal Physiology
[3 credit hours]
Lectures on the comparative and environmental physiology of vertebrates and invertebrates including metabolism, temperature regulation, respiration, circulation excretion and osmotic regulation.
Prerequisites: BIOL 3030 with a minimum grade of D- and BIOL 3070 with a minimum grade of D-
Term Offered: Spring, Summer

BIOL 6000 Introduction To Scientific Thought And Expression
[1,3 credit hours]
A writing intensive course for new graduate students that focuses on scientific hypothesis testing and reading the original literature in biology.
Term Offered: Spring, Fall

BIOL 6010 Advanced Molecular Biology
[3 credit hours]
Analysis of recent developments in prokaryotic and eukaryotic molecular biology through evaluation and discussion of current literature.
Term Offered: Fall

BIOL 6020 Advanced Molecular Biology Laboratory
[2 credit hours]
Students will gain a working knowledge of essential laboratory techniques used in molecular biology. These techniques, including polymerase chain reaction (PCR), electrophoresis, DNA cloning, microscopy and transfection, will be used in a course project to express and analyze a protein of interest in cultured mammalian cells. The concepts underlying these procedures will be studied online before the lab. This course is designed to prepare students for careers in research, biotechnology and science education.
Term Offered: Summer

BIOL 6030 Introduction to Graduate Studies
[2 credit hours]
This course is designed to provide new UToledo graduate students with essential information and tips to help them achieve their academic goals at the University of Toledo. Students will be given an overview of the various research options they have in the UToledo Department of Biological Sciences. Students will be given some basic training in statistical methods typically used in the biological sciences. Students will receive training in responsible conduct so they may perform research to a high ethical standard. This course will provide a foundation for students to properly conduct research and supply them with the information and resources for them to be successful in graduate school.
Term Offered: Fall

BIOL 6040 Introduction to Graduate Cell and Molecular Biology and Methods
[3 credit hours]
The main goals of this course are to provide basic knowledge of methods used in research laboratories to study molecular and cellular processes and to provide basic knowledge of those processes. This information is to provide the fundamental background knowledge necessary basis for our graduate students to succeed in our graduate program. Specific topics include cell culture, nucleic acid manipulation, electrophoresis, structure of nucleic acids and proteins, basic concepts of transcription and translation, cell membranes, protein sorting, the cytoskeleton, regulation of cell death and cancer.
Term Offered: Fall

BIOL 6090 Advanced Cell Biology
[3 credit hours]
An advanced course that stresses the experimental basis for current concepts of cell structure and function.
Term Offered: Spring

BIOL 6100 Research Methodology: Cell And Molecular Biology
[3 credit hours]
An in-depth discussion of techniques used in the study of cell and molecular biology. Examples include chromatography and fractionation, electrophoresis cell and molecular cloning.
Term Offered: Fall

BIOL 6200 Advanced Signal Transduction
[3 credit hours]
This course will provide an in-depth discussion of signal transduction topics important for cell/molecular biology research, emphasizing the interplay between intracellular signaling molecules needed to regulate physiological responses.
Prerequisites: BIOL 6010 with a minimum grade of D-
Term Offered: Spring

BIOL 6300 Advanced Microscopy and Imaging
[3 credit hours]
This course focuses on advanced quantitative fluorescence imaging methods used to visualize single molecules, organelles, cells and tissues in vitro and in vivo. Students will gain theoretical understanding of fluorescence-based imaging techniques such as confocal, TIRF, and super-resolution microscopy, and hands-on experience on the fundamentals of image analysis and quantification.
Prerequisites: BIOL 6090 with a minimum grade of D- and BIOL 6100 with a minimum grade of D-
Term Offered: Spring, Fall

BIOL 6830 Molecular and Cellular Biology
[4 credit hours]
Essential concepts of molecular genetics and cell biology. Major topics include gene structure and composition, transcription, translation, protein structure and function, cell cycle, cell movement, and cell signaling. Primarily intended for Master students enrolled in a non-laboratory research based degree program. Students who have received credit for either BIOL 6010 or BIOL 6090 cannot receive credit for BIOL 6830.
Term Offered: Summer

BIOL 6920 Special Projects In Biology
[2-4 credit hours]
Introduction to research on a selected problem under the direction of an individual faculty member.
Term Offered: Spring, Summer, Fall

BIOL 6930 Seminar In Biology
[1 credit hour]
Presentation on research or current literature by graduate students, faculty, or guest speakers.
Term Offered: Spring, Fall

BIOL 6960 Masters Thesis Research
[1-15 credit hours]
Research that normally contributes to the fulfillment of the M.S. thesis requirement.
Term Offered: Spring, Summer, Fall

BIOL 6980 Advanced Topics In Biology
[2-4 credit hours]
Seminar/discussion of significant current topics or problems in biology.
Term Offered: Spring

BIOL 6990 Advanced Readings In Biology
[2-4 credit hours]
Faculty directed readings or projects in a specific area of Biology.
Term Offered: Spring, Summer, Fall

BIOL 7030 Advanced Microbiology
[3 credit hours]
Lectures on the principles of modern microbiology and virology, including metabolism, growth, cellular morphology, genetics and host parasite relationships. Bacterial and viral diseases will be illustrated.
Term Offered: Spring

BIOL 7040 Advanced Microbiology Laboratory
[1 credit hour]
Laboratories utilizing basic microbiological techniques and illustrating principles of growth, identification and genetics of microbes.
Corequisites: BIOL 7030
Term Offered: Spring

BIOL 7050 Advanced Immunology
[3 credit hours]
The development, genetics and physiology of the immune response.
Term Offered: Spring, Fall

BIOL 8000 Introduction To Scientific Thought And Expression
[1,3 credit hours]
A writing intensive course for new graduate students that focuses on scientific hypothesis testing and reading the original literature in biology.
Term Offered: Spring, Fall

BIOL 8010 Advanced Molecular Biology
[3 credit hours]
Analysis of recent developments in prokaryotic and eukaryotic molecular biology through evaluation and discussion of current literature.
Term Offered: Fall

BIOL 8030 Introduction to Graduate Studies
[2 credit hours]
This course is designed to provide new UToledo graduate students with essential information and tips to help them achieve their academic goals at the University of Toledo. Students will be given an overview of the various research options they have in the UToledo Department of Biological Sciences. Students will be given some basic training in statistical methods typically used in the biological sciences. Students will receive training in responsible conduct so they may perform research to a high ethical standard. This course will provide a foundation for students to properly conduct research and supply them with the information and resources for them to be successful in graduate school.
Term Offered: Fall

BIOL 8040 Introduction to Graduate Cell and Molecular Biology and Methods
[3 credit hours]
The main goals of this course are to provide basic knowledge of methods used in research laboratories to study molecular and cellular processes and to provide basic knowledge of those processes. This information is to provide the fundamental background knowledge necessary basis for our graduate students to succeed in our graduate program. Specific topics include cell culture, nucleic acid manipulation, electrophoresis, structure of nucleic acids and proteins, basic concepts of transcription and translation, cell membranes, protein sorting, the cytoskeleton, regulation of cell death and cancer.
Term Offered: Fall

BIOL 8090 Advanced Cell Biology
[3 credit hours]
An advanced course that stresses the experimental basis for current concepts of cell structure and function.
Term Offered: Spring

BIOL 8100 Research Methodology: Cell And Molecular Biology
[3 credit hours]
An in-depth discussion of techniques used in the study of cell and molecular biology. Examples include chromatography and fractionation, electrophoresis cell and molecular cloning.
Term Offered: Fall

BIOL 8200 Advanced Signal Transduction
[3 credit hours]
This course will provide an in-depth discussion of signal transduction topics important for cell/molecular biology research, emphasizing the interplay between intracellular signaling molecules needed to regulate physiological responses.
Prerequisites: BIOL 8010 with a minimum grade of D-
Term Offered: Spring

BIOL 8300 Advanced Microscopy and Imaging
[3 credit hours]
This course focuses on advanced quantitative fluorescence imaging methods used to visualize single molecules, organelles, cells and tissues in vitro and in vivo. Students will gain theoretical understanding of fluorescence-based imaging techniques such as confocal, TIRF, and super-resolution microscopy, and hands-on experience on the fundamentals of image analysis and quantification.
Prerequisites: BIOL 8090 with a minimum grade of D- and BIOL 8100 with a minimum grade of D-
Term Offered: Fall

BIOL 8920 Special Projects In Biology
[2-4 credit hours]
Introduction to research on a selected problem under the direction of an individual faculty member.
Term Offered: Spring, Summer, Fall

BIOL 8930 Seminar In Biology
[1 credit hour]
Presentation on research or current literature by graduate students, faculty, or guest speakers.
Term Offered: Spring, Fall

BIOL 8960 Doctoral Dissertation Research
[1-15 credit hours]
Research normally leading to the fulfillment of the Ph.D. dissertation requirement.
Term Offered: Spring, Summer, Fall

BIOL 8990 Advanced Readings In Biology
[2-4 credit hours]
Faculty directed readings or projects in a specific area of Biology.
Term Offered: Spring, Summer, Fall

MS in Biology - Cell and Molecular Biology Concentration

Cell/Molecular Biology Concentration

The master's degree in biology (cell/molecular biology concentration) is awarded to a student who has demonstrated mastery in the field of biology and a distinct ability to make substantial contributions to the field. It is not awarded merely as a result of courses taken, nor for years spent in studying or research. The quality of work and the resourcefulness of the student must be such that the faculty can expect a continuing effort toward the advancement of knowledge and significant achievement in research and related activities.

The master's degree in biology prepares students to enter research careers in industrial and entrepreneurial settings, and non-research careers in a variety of areas including public policy, science communication, intellectual property law, and science education.

30 credit hours are required to earn the the master's degree and work and depending on the track, typically takes one to two years of study beyond the bachelor's degree. A substantial portion of this time is spent in independent research leading to a thesis or capstone, depending on the track.

Cell/Molecular Biology Concentration

Track A (Research Thesis)

For the degree of Master of Science in Biology (cell/ molecular biology concentration), a student must complete a minimum of 30 semester hours of graduate course work approved by an advisory committee, including:

Code	Title	Hours
BIOL 6000	Introduction To Scientific Thought And Expression	1
BIOL 6010	Advanced Molecular Biology	3
BIOL 6090	Advanced Cell Biology	3

BIOL 6100	Research Methodology: Cell And Molecular Biology	3
BIOL 6200	Advanced Signal Transduction	3
BIOL 6930	Seminar In Biology (take twice)	2
BIOL 6030	Introduction to Graduate Studies	2
BIOL 6040	Introduction to Graduate Cell and Molecular Biology and Methods	3
BIOL 6960	Masters Thesis Research	10
Total Hours		**30**

Track B (Capstone, Non-Research Thesis)

For the degree of Master of Science in biology, a student must complete a minimum of 30 semester hours of graduate course work approved by an advisory committee, including:

Code	Title	Hours
BIOL 6090	Advanced Cell Biology	3
BIOL 6930	Seminar In Biology (take twice)	2
BIOL 6030	Introduction to Graduate Studies	2
BIOL 6040	Introduction to Graduate Cell and Molecular Biology and Methods	3
BIOL 6200	Advanced Signal Transduction	3
BIOL 6990	Advanced Readings In Biology	3
Select additional course and research credits at 5000-6000 level		13
BIOL 6000	Introduction To Scientific Thought And Expression	1
Total Hours		**30**

Up to 10 hours of graduate credit may be transferred from another accredited institution, as the student's advisory committee recommends.

Track C (Combined BS to MS Research Thesis)

Undergraduate students accepted to the BS to MS in Research Thesis track are allowed to complete up to 9 credit hours during their final academic year of undergraduate studies. The graduate coursework (up to nine hours) may be applied to meet both undergraduate and graduate degree requirements. Students admitted into this pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate in graduate courses. After completing the undergraduate degree requirements, they will continue in the graduate program. To enter the program, an undergraduate student needs to have an overall BS or BA with a GPA of 3.00 or an overall GPA of 2.75 with a GPA of at least 3.00 in the last 30 credit hours.

It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit:

1) Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

2) Graduate classes are taken at The University of Toledo only after the student is accepted into the program,

3) The four graduate-level classes (nine credit hours) during their final academic year of undergraduate studies are:

Code	Title	Hours
BIOL 6030	Introduction to Graduate Studies	2
BIOL 6040	Introduction to Graduate Cell and Molecular Biology and Methods	3
BIOL 6960	Masters Thesis Research	1
BIOL 6200	Advanced Signal Transduction	3

All other classes are as stipulated in track A.

Track D (Combined BS to MS Capstone, Non-Research Thesis)

Undergraduate students accepted to the BS or BA to MS with Capstone (Non-Research Thesis) track are allowed to complete up to 9 credit hours during their final academic year of undergraduate studies. The graduate coursework (up to nine hours) may be applied to meet both undergraduate and graduate degree requirements. Students admitted into this pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate in graduate courses. After completing the undergraduate degree requirements, they will continue in the graduate program. To enter the program, an undergraduate student needs to have an overall BS or BA with a GPA of 3.00 or an overall GPA of 2.75 with a GPA of at least 3.00 in the last 30 credit hours.

It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit:

1) Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.
2) Graduate classes are taken at The University of Toledo only after the student is accepted into the program,

3) The four graduate-level classes (nine credit hours) during their final academic year of undergraduate studies are:

Code	Title	Hours
BIOL 6030	Introduction to Graduate Studies	2
BIOL 6040	Introduction to Graduate Cell and Molecular Biology and Methods	3
BIOL 6960	Masters Thesis Research	1
BIOL 6200	Advanced Signal Transduction	3
or BIOL 6090	Advanced Cell Biology	

All other classes are as stipulated in track B.

Combined bachelor's to master's- MS Biology - Cell and Molecular Biology (Track C Research or Track D Non-Research)

Undergraduate students accepted to the BS in Biology/MS Biology - Cell and Molecular Biology (Track C Research or Track D Non-Research)

option will be admitted to the MS Biology - Cell and Molecular Biology and allowed to complete up to three graduate level classes (nine credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in to the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) BIOL 6030 Introduction to Graduate Studies, BIOL 6040 Introduction to Graduate Cell and Molecular Biology and Methods, BIOL 6200 Advanced Signal Transduction or BIOL 6090 Advanced Cell Biology or BIOL 6960 Graduate Research may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

First Term		Hours
BIOL 6030	Introduction to Graduate Studies	2
BIOL 6040	Introduction to Graduate Cell and Molecular Biology and Methods	3
BIOL 6930	Seminar In Biology	1
BIOL 6960	Masters Thesis Research	3
BIOL 6000	Introduction To Scientific Thought And Expression	3
	Hours	**12**
Second Term		
BIOL 6090	Advanced Cell Biology	3
BIOL 6200	Advanced Signal Transduction	3
BIOL 6960	Masters Thesis Research	1
	Hours	**7**
Third Term		
BIOL 6960	Masters Thesis Research	1
	Hours	**1**
Fourth Term		
BIOL 6010	Advanced Molecular Biology	3
BIOL 6100	Research Methodology: Cell And Molecular Biology	3
BIOL 6930	Seminar In Biology	1
BIOL 6960	Masters Thesis Research	3
	Hours	**10**
	Total Hours	**30**

- PLO 1. Students will demonstrate an in-depth understanding of and the ability to communicate scientific information within an area of specialized study within the biological sciences.
- PLO2. Students will demonstrate an understanding of how to conduct experiments, collect and interpret data, and disseminate those data in written and verbal modalities.
- PLO 3. Thesis track: Students will demonstrate an ability to conduct experiments, collect and interpret data, and disseminate those data in written and verbal modalities.
- PLO 4. Non-thesis track: Students will demonstrate an ability to review and evaluate the published literature and effectively communicate their findings in verbal and written modalities.
- PLO 5. Students will demonstrate knowledge of their ethical responsibility when conducting research in terms of proper scientific conduct and the rights of human subjects.

PhD in Biology - Cell And Molecular Biology Concentration

Cell/Molecular Biology Concentration

The doctoral degree in biology (cell/molecular biology concentration) is awarded to a student who has demonstrated mastery in the field of biology and a distinct and superior ability to make substantial contributions to the field. It is not awarded merely as a result of courses taken, nor for years spent in studying or research. The quality of work and the resourcefulness of the student must be such that the faculty can expect a continuing effort toward the advancement of knowledge and significant achievement in research and related activities.

The doctoral degree in biology prepares students to enter research careers in academic and industrial settings, and non-research careers in a variety of areas including public policy, science communication, intellectual property law, and science education.

The doctoral degree provides a foundation in molecular, cellular, and developmental biology, research methodologies and practices, rigorous hypothesis-driven scientific investigation, and the dissemination of research results and ideas.

In general, work for the Ph.D. takes five years of study beyond the bachelor's degree. A substantial portion of this time is spent in independent research leading to a dissertation. Up to 30 hours toward a master's degree may apply as part of the student's doctoral program. Normally 90 credit hours of study beyond the bachelor's degree are required for the Ph.D.

Each student must complete an individualized program of study in the area of cell/molecular biology approved by the student's advisory committee and the department. This course of study must include:

Code	Title	Hours
BIOL 8000	Introduction To Scientific Thought And Expression	3
BIOL 8090	Advanced Cell Biology	3
BIOL 8030	Introduction to Graduate Studies	2
BIOL 8040	Introduction to Graduate Cell and Molecular Biology and Methods	3
BIOL 8010	Advanced Molecular Biology	3

BIOL 8100	Research Methodology: Cell And Molecular Biology	3
BIOL 8200	Advanced Signal Transduction	3
BIOL 8930	Seminar In Biology (take 3 times)	3
BIOL 8960	Doctoral Dissertation Research (At least 60 hours)	60
Select additional courses and research credits (at the 7000/8000 level) up to a total of 7 hours		
Total Hours		90

- PLO 1. Students will demonstrate an in-depth understanding of and the ability to communicate scientific information within an area of specialized study within the biological sciences.
- PLO 2. Students will demonstrate an understanding of how to conduct experiments, collect and interpret data, and disseminate those data in written and verbal modalities.
- PLO 3. Students will demonstrate the ability to conduct experiments, collect and interpret data, and disseminate those data in written and verbal modalities.
- PLO 4. Students will demonstrate knowledge of their ethical responsibility when conducting research in terms of proper scientific conduct and the rights of human subjects.

Department of Physics and Astronomy

Nikolas Podraza, Chair
Rupali Chandar, Associate Chair
Anne Medling, Graduate Advisor

Mission: The University of Toledo graduate programs in Physics and Astronomy aim to develop exceptional personal and professional scientific skills, and engage students in cutting edge research with a world-class faculty, all within a supportive and creative learning environment.

General Description: The graduate programs offer specialization in the following areas: Astronomy and Astrophysics, Photovoltaics and Condensed Matter Physics consisting of theory and experiment, Atomic and Molecular Physics, Medical Physics, Biophysics, Photonics. The coursework is tailored to a specific area of research concentration, with flexibility to acquire the skills necessary to complete an innovative, important, and original thesis research project. The PhD program consists of courses from the core curriculum during the first and second years. While students may begin research immediately (oftentimes in addition to coursework and teaching assistant duties), a student will typically join a research group starting the summer following the first year. Following the 2ndyear, the focus will be primarily on thesis research with a faculty advisor. The thesis defense is scheduled once a substantial body of innovative research has been completed. A M.S. in Physics is offered which may be coursework or research intensive. A professional M.S. degree in photovoltaics is offered for which an industrial internship is required.

Accreditation: The PhD in Medical Physics program is accredited by CAMPEP.

Number of Credit Hours: The PhD program requires 90 credit hours with a minimum of 30 research credits for a thesis.

Outcomes: The graduate programs in physics and astronomy prepares students for jobs in research and development settings. These include private industry, government laboratories, academia and other non-profit organizations. The graduate programs develop a strong and broad foundation in fundamental physics, while simultaneously teaching mathematical and problem-solving skills necessary to advance knowledge of our physical world. The program trains students in state of the art theory, computing and laboratory skills relevant to their area of expertise.

Degrees Offered

- MS in Physics (p. 238) (thesis and non- thesis options (coursework intensive)
- MS Physics - Photovoltaics Concentration (p. 239)
- PhD in Physics (p. 240)
- Materials Science, Graduate Certificate (p. 237)
- Photovoltaics, Graduate Certificate (p. 237)

PHYS 5210 Theoretical Mechanics
[3 credit hours]
Kinematics and dynamics of particles and rigid bodies. Lagrangian and Hamiltonian equations of motion.
Term Offered: Fall

PHYS 5230 Classical Electricity And Magnetism I
[3 credit hours]
Electrostatics: the equations of Laplace and Poisson-Maxwell's equations and their solutions.
Term Offered: Fall

PHYS 5240 Electricity And Magnetism II
[3 credit hours]
Maxwell's equations and their solutions; electromagnetic radiation.
Prerequisites: PHYS 5230 with a minimum grade of D-
Term Offered: Spring

PHYS 5310 Quantum Mechanics
[3 credit hours]
Formalism and applications of quantum mechanics: Hilbert space, time independent and time-dependent perturbation theories, atomic and molecular structure and spectra, and scattering theory.
Term Offered: Spring

PHYS 5810 Astrophysics I
[3 credit hours]
Spherical coordinate systems, astronomical time, celestial mechanics, the solar system and planetary physics, photometry, radiative transfer, stellar spectra and classification, binary stars and stellar masses.
Term Offered: Fall

PHYS 5820 Astrophysics II
[3 credit hours]
Stellar structure and evolution, close binaries, origin of the elements, the sun, variable stars, star clusters, the interstellar medium, the Milky Way Galaxy, stellar statistics, galaxy structure and evolution, cosmology.
Prerequisites: PHYS 5810 with a minimum grade of D-
Term Offered: Spring

PHYS 5900 Research Techniques In Physics And Astronomy
[1-6 credit hours]
Research work under the guidance of a member of the graduate faculty. Designed to prepare the student to propose and carry out the thesis research required for the M.S. degree.
Term Offered: Summer

PHYS 6010 Physics And Astronomy Colloquium
[0-2 credit hours]
Topical lectures by visiting and local professionals.
Term Offered: Spring, Fall

PHYS 6020 Physics And Astronomy Journal Seminar
[0-1 credit hours]
Literature review seminar.
Term Offered: Spring, Fall

PHYS 6040 Physics and Astronomy Professional Development Seminar
[1 credit hour]
This seminar is intended to help graduate students assess future career options and develop skills that will enhance their productivity and marketability for those careers. The class will involve strong faculty-student and peer student interaction with the goal of getting students to actively consider potential career paths and to start mapping out the steps necessary to achieve them. There will be periodic small homework assignments and grades will be assigned as pass/fail.
Term Offered: Fall

PHYS 6120 Statistical Analysis for Physicists
[3 credit hours]
Probability, random variables, special random variables, functions of random variables, random numbers, error propagation, Monte Carlo simulations, frequentist parameter estimation, frequentist hypothesis testing, Bayesian parameter estimation, Bayesian model selection, signal-to-noise estimation
Term Offered: Fall

PHYS 6140 Fundamentals Of Modern Physics
[3 credit hours]
An intensive course which reviews the fundamentals of atomic, statistical and condensed matter physics. Provides a common foundation for entering graduate students for succeeding courses in physics and astronomy.
Term Offered: Fall

PHYS 6180 Advanced Atomic And Nuclear Physics Laboratory
[2-3 credit hours]
Experiments in nuclear, atomic, and condensed matter physics, such as gamma-ray and X-ray spectroscopies, beta and alpha particle spectroscopics, NMR, ESR, Mossbauer effect, neutron shielding, detectors and electronics, and atomic emission spectroscopy. One four-hour lab and one hour lecture per week.
Prerequisites: PHYS 6140 with a minimum grade of D-
Term Offered: Spring

PHYS 6220 Classical Mechanics
[3 credit hours]
Advanced classical mechanics, including the variational principles, Lagrange and Hamilton mechanics, and linear and nonlinear systems.
Term Offered: Fall

PHYS 6250 Classical Electrodynamics I
[3 credit hours]
Solutions to Poisson's equation in Cartesian, spherical and cylindrical coordinates with Dirichlet, Neuman and mixed boundary conditions. Maxwell's equations and their solutions applied to waveguides and nonlinear materials.
Term Offered: Spring

PHYS 6260 Classical Electrodynamics II
[3 credit hours]
Solutions to the wave equation with time dependent source terms, energy loss from high energy charged particles in dense materials, special relativity, classical field theory, invariant Lagrangians and conserved quantities.
Prerequisites: PHYS 6250 with a minimum grade of D-
Term Offered: Fall

PHYS 6280 Photovoltaic Materials And Device Physics Laboratory
[3 credit hours]
Fabrication and characterization of solar cell materials and devices, addressing materials science and physics of substrate preparation, absorber and window deposition processes, metal contact formation, and measurement of physical properties. One four-hour lab and one-hour lecture per week.
Prerequisites: PHYS 6140 with a minimum grade of D- and PHYS 7140 with a minimum grade of D-
Term Offered: Fall

PHYS 6320 Quantum Mechanics I
[3 credit hours]
Quantum theory and its application to physical problems. Topics include dynamics in the Schrodinger and Heisenberg pictures, invariance principles and angular momentum theory, perturbation theory, the variational method.
Term Offered: Fall

PHYS 6330 Quantum Mechanics II
[3 credit hours]
The quantum theory of scattering, electromagnetic interactions, quantization of the electromagnetic field and introduction to the Dirac equation.
Term Offered: Spring

PHYS 6450 Statistical Mechanics
[3 credit hours]
A fundamental quantum-mechanical development of statistical thermodynamics. Non-interacting and weakly interacting many-particle systems in the classical and quantum regimes, with applications to various fields of physics.
Term Offered: Spring

PHYS 6540 Structure, Defects And Diffusion
[4 credit hours]
A generic materials science approach to the study of crystalline structure, defects (point, line and planar) in crystalline materials, and the mechanisms and kinetics of diffusion in the condensed state.
Term Offered: Fall

PHYS 6550 Thermodynamics And Phase Transformations In Condensed Systems
[4 credit hours]
A materials science approach to the thermodynamics of condensed state equilibria and phase transformation kinetics.
Prerequisites: PHYS 6450 with a minimum grade of D-
Term Offered: Spring

PHYS 6630 Semiconductors I
[3 credit hours]
Review of modern theory of solids. Semiconducting and metallic materials. Semiconductor devices including p-n junctions and solar cells.
Prerequisites: PHYS 4510 with a minimum grade of D- and EECS 4400 with a minimum grade of D-
Term Offered: Spring

PHYS 6640 Fundamentals of Solar Cells
[3 credit hours]
Worldwide status of Photovoltaics, Semiconductors. P-n junction diodes. Ideal solar cells. Efficiency losses. Single crystals and thin films technologies. PV systems.
Prerequisites: PHYS 4510 with a minimum grade of D- and EECS 4400 with a minimum grade of D-
Term Offered: Spring

PHYS 6660 Foundations of Glass Science
[3 credit hours]
This course introduces the scientific foundations of glass. Topics include glass formation, structure, phase transformations, vibrational and thermal properties, atomic and ionic transport, viscosity and glass transition, electronic and optical properties, surface and chemical durability, and mechanical properties. Emphasis is placed on linking atomic-scale structure and bonding to macroscopic behavior across different families of glasses. The course provides a conceptual foundation for students pursuing glass science, materials science, and related research or industries.
Term Offered: Fall

PHYS 6670 Glass Technologies
[3 credit hours]
A foundational course on glass technologies with emphasis on industrial practices. Topics include both conventional and non-conventional glass making, forming, and processing technologies across a broad range of glass families and product forms. Emphasis is also placed on how glass technologies are developed to align with composition and to engineer structure, thereby achieving tailored properties and functionalities in glass products. Historical and current glass industry players, manufacturing technologies, and products that have shaped the modern world are also highlighted throughout the course.
Term Offered: Spring

PHYS 6810 Stellar Astrophysics I
[3 credit hours]
Stellar atmospheres and their emergent spectra. Physics of radiation, matter and their interaction. Radiative transfer, hydrostatic and radiative equilibrium, convection, line formation and spectral signatures of atmospheric physics.
Term Offered: Fall

PHYS 6820 Stellar Astrophysics II
[3 credit hours]
Stellar structure and evolution. Equation of state, nuclear reactions and nucleosynthesis, stellar formation, evolution and death, enrichment of the interstellar medium, formation of planetary systems, solar physics and helioseismology.
Term Offered: Spring

PHYS 6830 Galactic Astronomy I
[3 credit hours]
Stellar spectra, colors, compositions and ages; star clusters; pulsating stars; calibration of distance indicators. Interstellar dust, interstellar extinction, interstellar gas, nebulae; structure of the interstellar medium.
Term Offered: Fall

PHYS 6840 Galactic Astronomy II
[3 credit hours]
Structure and dynamics of the Galaxy, shocks and explosions, stellar kinematics, galactic rotation, and dynamical and chemical evolution.
Term Offered: Spring

PHYS 6940 Industrial Internship
[1-6 credit hours]
Experiential learning in an academic advisor-approved business, industry, or non-profit. Six credits are required for the PSM degree.
Term Offered: Spring, Summer, Fall

PHYS 6960 M.s. Thesis Research
[1-15 credit hours]
Thesis research required for the M.S. degree.
Term Offered: Spring, Summer, Fall

PHYS 6980 Special Topics
[1-4 credit hours]
Course reserved for visiting lecturers and topics not covered otherwise.
Term Offered: Spring, Summer, Fall

PHYS 6990 Independent Study
[1-4 credit hours]

PHYS 7140 Fundamentals Of Modern Physics
[3 credit hours]
An intensive course which reviews the fundamentals of atomic, statistical and condensed matter physics. Provides a common foundation for entering graduate students for succeeding courses in physics and astronomy.
Term Offered: Fall

PHYS 7180 Advanced Atomic and Nuclear Physics Laboratory
[2-3 credit hours]
Experiments in nuclear, atomic, and condensed matter physics, such as gamma-ray and X-ray spectroscopies, betas and alpha parrticle spectroscopies, NMR, ESR, Mossbauer effect, neutron shielding, detectors and electronics, and atomic emission spectroscopy. One four-hour lab and one hour lecture per week.
Prerequisites: PHYS 6140 with a minimum grade of D- or PHYS 7140 with a minimum grade of D-
Term Offered: Spring

PHYS 7220 Classical Mechanics
[3 credit hours]
Advanced classical mechanics, including the variational principles, Lagrange and Hamilton mechanics, and linear and nonlinear systems.
Term Offered: Fall

PHYS 7250 Classical Electrodynamics I
[3 credit hours]
Solutions to Poisson's equation in Cartesian, spherical and cylindrical coordinates with Dirichlet, Neuman and mixed boundary conditions. Maxwell's equations and their solutions applied to waveguides and nonlinear materials.
Term Offered: Spring

PHYS 7260 Classical Electrodynamics II
[3 credit hours]
Solutions to the wave equation with time dependent source terms, energy loss from high energy charged particles in dense materials, special relativity, classical field theory, invariant Lagrangians and conserved quantities.
Prerequisites: PHYS 6250 with a minimum grade of D- or PHYS 7250 with a minimum grade of D-
Term Offered: Fall

PHYS 7280 Photovoltaic Materials And Device Physics Laboratory
[3 credit hours]
Detailed fabrication and characterization of solar cell materials and devices, addressing materials science and physics of substrate preparation, absorber and window deposition processes, metal contact formation, and measurement of physical properties. One four-hour lab and one-hour lecture per week.
Prerequisites: PHYS 6140 with a minimum grade of D- and PHYS 7140 with a minimum grade of D-
Term Offered: Fall

PHYS 7320 Quantum Mechanics I
[3 credit hours]
Quantum theory and its application to physical problems. Topics include dynamics in the Schrodinger and Heisenberg pictures, invariance principles and angular momentum theory, perturbation theory, the variational method.
Term Offered: Fall

PHYS 7330 Quantum Mechanics II
[3 credit hours]
The quantum theory of scattering, electromagnetic interactions, quantization of the electromagnetic field and introduction to the Dirac equation.
Term Offered: Spring

PHYS 7450 Statistical Mechanics
[3 credit hours]
A fundamental quantum-mechanical development of statistical thermodynamics. Non-interacting and weakly interacting many-particle systems in the classical and quantum regimes, with applications to various fields of physics.
Term Offered: Spring

PHYS 7810 Stellar Astrophysics I
[3 credit hours]
Stellar atmospheres and their emergent spectra. Physics of radiation, matter and their interaction. Radiative transfer, hydrostatic and radiative equilibrium, convection, line formation, and spectral signatures of atmospheric physics.
Term Offered: Fall

PHYS 7820 Stellar Astrophysics II
[3 credit hours]
Stellar structure and evolution. Equation of state, nuclear reactions and nucleosynthesis, stellar formation, evolution and death, enrichment of the interstellar medium, formation of planetary systems, solar physics and helioseismology.
Term Offered: Spring

PHYS 7830 Galactic Astronomy I
[3 credit hours]
Stellar spectra, colors, compositions, and ages; star clusters; pulsating stars; calibration of distance indicators. Interstellar dust, interstellar extinction, interstellar gas, nebulae; structure of the interstellar medium.
Term Offered: Fall

PHYS 7840 Galactic Astronomy II
[3 credit hours]
Structure and dynamics of the Galaxy, shocks and explosions, stellar kinematics, galactic rotation, and dynamical and chemical evolution.

PHYS 7910 Advanced Research In Physics And Astronomy
[1-15 credit hours]
Research work under the guidance of a member of the graduate faculty. Designed to prepare the student to propose and carry out the thesis research required for the Ph.D. degree.
Term Offered: Spring, Summer, Fall

PHYS 8010 Physics And Astronomy Colloquium
[0-2 credit hours]
Topical lectures by visiting and local professionals.
Term Offered: Spring, Fall

PHYS 8020 Physics And Astronomy Journal Seminar
[0-1 credit hours]
Literature review seminar.
Term Offered: Spring, Fall

PHYS 8040 Physics and Astronomy Professional Development Seminar
[1 credit hour]
This seminar is intended to help graduate students assess future career options and develop skills that will enhance their productivity and marketability for those careers. The class will involve strong faculty-student and peer student interaction with the goal of getting students to actively consider potential career paths and to start mapping out the steps necessary to achieve them. There will be periodic small homework assignments and grades will be assigned as pass/fail.
Term Offered: Fall

PHYS 8540 Structure, Defects And Diffusion
[4 credit hours]
A generic materials science approach to the study of crystalline structure, defects (point, line and planar) in crystalline materials, and the mechanisms and kinetics of diffusion in the condensed state.
Term Offered: Fall

PHYS 8550 Thermodynamics And Phase Transformations In Condensed Systems
[4 credit hours]
A materials science approach to the thermodynamics of condensed state equilibria and phase transformation kinetics.
Prerequisites: PHYS 6540 with a minimum grade of D- or PHYS 8540 with a minimum grade of D-
Term Offered: Spring

PHYS 8590 Current Issues In Condensed Matter And Material Science
[3 credit hours]
A survey of various areas in the physics of condensed matter and materials. Content will vary with instructor and from year to year.

PHYS 8630 Semiconductors I
[3 credit hours]
Review of modern theory of solids. Semiconducting and metallic materials. Semiconductor devices including p-n junctions and solar cells.
Prerequisites: PHYS 4510 with a minimum grade of D- and EECS 4400 with a minimum grade of D-
Term Offered: Spring

PHYS 8640 Fundamentals of Solar Cells
[3 credit hours]
Worldwide status of Photovoltaics, Semiconductors. P-n junction diodes. Ideal solar cells. Efficiency losses. Single crystals and thin films technologies. PV systems.
Prerequisites: PHYS 4510 with a minimum grade of D- and EECS 4400 with a minimum grade of D-
Term Offered: Spring

PHYS 8860 General Relativity
[3 credit hours]
Differential geometry, exterior calculus of tensors, the stress-energy tensor and Einstein field equation, stellar evolution and black holes, gravitational lensing, tests of the theory, and gravitational wave detection.
Prerequisites: PHYS 7260 with a minimum grade of D-
Term Offered: Spring, Fall

PHYS 8870 Cosmology
[3 credit hours]
Cosmological solutions for Einstein's field equation, the standard cosmological model, particle physics, nucleosynthesis and the cosmic background radiation. Inflation, dark matter and mass distribution, gravitational evolution, and formation of galaxies.
Prerequisites: PHYS 8860 with a minimum grade of D-
Term Offered: Fall

PHYS 8960 Ph. D. Thesis Research
[1-15 credit hours]
Thesis research required for the Ph.D. degree.
Term Offered: Spring, Summer, Fall

PHYS 8980 Special Topics
[1-4 credit hours]
Course reserved for visiting lecturers and topics not covered otherwise.
Term Offered: Spring, Summer, Fall

PHYS 8990 Independent Study
[1-4 credit hours]

Materials Science, Graduate Certificate

Scientific breakthroughs and technological development now often require an interdisciplinary understanding of relationships between materials, properties, and fabrication processes in sectors and products including, but not limited to, glass, solar, semiconductors, energy, steel, biomedical devices and others. The Graduate Certificate in Materials Science focuses on key aspects of materials including structure, defects, diffusion, equilibria, phase transformations, and growth including behavior at the nanoscale through two core courses in these topics. Choices of two additional courses in concepts and applications enable exploration of individual interests relevant to the field of your choice.

The Materials Science, Graduate Certificate requires a minimum of 14 credit hours.

Code	Title	Hours
Select one of the following		4
PHYS 6540	Structure, Defects And Diffusion	
CHEM 6810	Materials Science I	
Select one of the following		4
PHYS 6550	Thermodynamics And Phase Transformations In Condensed Systems	
CHEM 6820	Materials Science II	
Select two of the following		6-8
PHYS 6280	Photovoltaic Materials And Device Physics Laboratory	
PHYS 6450	Statistical Mechanics	
PHYS 6630	Semiconductors I	
PHYS 6640	Fundamentals of Solar Cells	
PHYS 6980	Special Topics	
PHYS 6990	Independent Study	
CHEM 6310	Separation Methods	
CHEM 6320	Electrochemistry	
CHEM 6800	Advanced Materials Chemistry	
CHEM 6830	Nanomaterials Science	
CHEM 6850	X-Ray Crystallography	
CHEM 6980	Special Topics In Chemistry	
Total Hours		**14-16**

- Demonstrate an understanding of foundational concepts in chemistry and physics as applied to materials science.
- Demonstrate an understanding of material structure, defects, diffusion, equilibria, phase transformations, and growth and implications for classes of materials, materials characterization, or applications.
- Communicate technical information clearly and accurately in written, oral, and visual formats.
- Locate and use information in the primary literature and research databases.
- Critically read, assess, and evaluate scientific publications, presentations, and data.
- Understand and observe proper safety, ethical, and professional practices.
- Apply scientific skills in an interdisciplinary scientific context.
- Demonstrate understanding of the relationships between process-property relationships spanning from the fundamental theoretical formalism to final materials or device behavior.

Photovoltaics, Graduate Certificate

The Graduate Certificate in Photovoltaics is designed for scientists, engineers, energy professionals, and technically minded individuals

looking to specialize or pivot into the rapidly expanding solar energy sector. This certificate equips you with in-demand skills in understanding the principles of semiconductor materials and solar cells, and with hands-on experience in photovoltaic materials and devices, through three core courses in these topics. The choice of one additional physics course enables exploration of deep science in the field of interest to develop an advanced understanding of quantum physics, electrodynamics, thermodynamics, and related topics. Whether you're a working professional seeking upskilling or a student aiming to stand out in a competitive job market, this program offers a focused, practical education rooted in real-world applications and industry needs. It will help professionals to stay ahead of evolving photovoltaic technologies, broaden their career opportunities, demonstrate a commitment to renewable energy innovation, and gain a competitive edge in the clean energy transition.

Required courses:

Code	Title	Hours
PHYS 6280	Photovoltaic Materials And Device Physics Laboratory	3
PHYS 6630	Semiconductors I	3
PHYS 6640	Fundamentals of Solar Cells	3
Take one elective course of:		3
PHYS 6250	Classical Electrodynamics I	
PHYS 6320	Quantum Mechanics I	
PHYS 6450	Statistical Mechanics	
PHYS 6980	Special Topics	
Total Hours		**12**

- Demonstrate an understanding of foundational concepts in chemistry, physics, and engineering as applied to photovoltaics.
- Demonstrate an understanding of the PV materials and devices, including\noptical, electrical, structural, and defect properties, phase transformations, and growth, materials characterization, device working principle, or applications.
- Communicate technical information clearly and accurately in written, oral, and visual formats.
- Locate and use information in the primary literature and research databases.
- Critically read, assess, and evaluate scientific publications, presentations, and data.
- Understand and observe proper safety, ethical, and professional practices.
- Apply scientific skills in an interdisciplinary scientific context.

MS in Physics

For a degree of MS a student must complete at least 30 hours of graduate credit with specific stipulations as mentioned in the catalog. The degree has two options: (i) with a thesis and (ii) without a thesis. The thesis option involves at least 6 credits of research conducted under supervision of a thesis advisor. A thesis written and defended by the student in front of a committee of faculty members is necessary for this option to be completed. In addition to the required coursework, in the non-thesis option, a student must prepare a project report based on literature research or independent research or a combination thereof, conducted under the supervision of the student's project advisor or co-advisors. The report should be prepared in accordance with the format specified by the advisory committee and the student should present an oral defense of the project results.

Requirements for the Master's Degree

M.S. in Physics Thesis Option

For the master of science or master of science and education, a student must complete 30 hours of graduate credit that includes the following:

1. PHYS 6140 and an additional 15 hours of graduate course credit in physics, with six of the 15 hours numbered above 6000. Credit in PHYS 5900, PHYS 6010/PHYS 8010, PHYS 6020/PHYS 8020 or PHYS 7910 will not count toward either degree.
2. The student must present a satisfactory thesis based on directed research, for no more than eight credit hours.
3. The remaining hours within the 30 total may be chosen from graduate courses approved by the student's committee. In some cases students working toward the Ph.D. may earn the M.S. degree without formal presentation of the M.S. thesis if they have passed the Ph.D. qualifying examination, satisfied the course requirements for the M.S., and completed a research project under the supervision of a research adviser. Students meeting these requirements may petition the department to grant the M.S. without formal presentation of a thesis.

M.S. in Physics Intensive Coursework Option (non-thesis)

For the coursework intensive M.S. in Physics the student must complete at least 30 hours of graduate credit including the following:

1. At least 24 hours of graduate course credit in physics, with at least 12 of the 24 hours numbered above 6000. No more than 6 hours of graduate research course credit may count towards the 24 hours. Credit in PHYS 5900, PHYS 6010/PHYS 8010, or PHYS 6020/PHYS 8020 or PHYS 7910 will not count toward the degree requirements.

2. In addition to the required coursework, a student must prepare a project report based either on literature research or independent research or a combination thereof, conducted under the supervision of the student's project advisor or co-advisors. The report should be prepared in accordance with the format specified by the advisory committee and the student should present an oral defense of the project results.

3. The remaining hours to complete the 30 total required hours may be chosen from any courses approved for graduate credit with the approval of the student's advisory committee.

Combined Bachelor's to master's Pipeline Program

Undergraduate students accepted to the Physics Pipeline Program will be admitted to the MS Physics with Non-Thesis Option and allowed to complete up to nine credits of graduate level classes while completing their final 1-2 years of undergraduate studies. Students admitted into the pipeline program must apply for

admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine credit hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine credit hours of graduate taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when all undergraduate degree requirements are satisfied.

ELIGIBILITY REQUIREMENTS

UT undergraduate students must 1) be majoring in the BS in Physics degree program, 2) have a minimum of 3.2 cumulative undergraduate grade point average that will include undergraduate credits earned at other institutions and transferred to UT, and 3) have approval of their advisor and department chair.

APPLICATION PROCESS

Students in BS Physics program can submit their application after completing at least 9 credit hours of physics (PHYS) or astronomy (ASTR) courses at PHYS/ASTR 3000 level or above. Application to this early pipeline program must contain 1) a letter of interest, 2) a completed graduate admission application, and 3) at least 2 letters of recommendation from faculty members.

Pipeline B.S. to M.S. COURSES

In order for students to use up to 9 credit hours toward both BS and MS degree requirements, students in the pipeline program need to register for the graduate version for 3 of the following courses: PHYS 5130, PHYS 5210, PHYS 5230, PHYS 5240, PHYS 5310, PHYS 5430, PHYS 5440, PHYS 5510, PHYS 6280, PHYS 6630 or upon approval of either Graduate Advisor or Department Chair, other PHYS courses at the 5000 level or greater, excluding PHYS 5900, PHYS 6010/PHYS 8010, PHYS 6020/8020, and PHYS 7910.

M.S. in Physics with Materials Science Option

A master of science degree in physics with a materials science option is available. For this degree, a student must complete 30 hours of graduate credit, including the following:

1. PHYS 6140, PHYS 6540, PHYS 6550 and an additional 12 hours of graduate course credit in physics with six of the 12 hours numbered above 6000. Credit in PHYS 5900, PHYS 6010/PHYS 8010, or PHYS 6020/PHYS 8020 or PHYS 7910 will not count toward the degree requirements.
2. The student must present a satisfactory thesis based on directed research, for no more than eight credit hours.
3. The remaining hours within the 30 total may be chosen from any graduate courses approved by the student's committee.

MS in Physics - Concentration in Photovoltaics

This National Professional Sciences Master's Association (NPSMA) recognized degree program is designed for students who want to work in the photovoltaics (PV) industry upon graduation. It prepares master's students with a strong foundation in the fundamentals of PV science and technology. It complements science education through management course work directly relevant to business aspects of manufacturing. It exposes students to a range of research activities on the UToledo campus in laboratories of world-expert faculty in PV. Placement of students as interns in PV manufacturing facilities for six months to enhance their practical training and employability is a critical part of the program. There is no thesis requirement for this degree.

The Photovoltaics concentration is designed for students with an undergraduate degree in Physics, Chemistry, an Engineering discipline (e.g. Electrical, Chemical, or Mechanical), or an otherwise related field.

Code	Title	Hours
PHYS 6280	Photovoltaic Materials And Device Physics Laboratory	3
PHYS 6630	Semiconductors I	3
PHYS 6640	Fundamentals of Solar Cells	3
PHYS 6940	Industrial Internship	6
PHYS 6960	M.s. Thesis Research	3-5
PHYS 6990	Independent Study	3
Select two of the following:		6-8
PHYS 6250	Classical Electrodynamics I	
PHYS 6320	Quantum Mechanics I	
PHYS 6520		
PHYS 6540	Structure, Defects And Diffusion	
PHYS 6550	Thermodynamics And Phase Transformations In Condensed Systems	
PHYS 6980	Special Topics	
Select two of the following:		6
BUAD 6400	Results-Based Management	
BUAD 6600	Supply Chain Management	
CHEE 6010	Green Engineering Principles	
CIVE 5690	Sustainability Engineering	
EFSB 6590	New Venture Creation	
EFSB 6690	Strategic Management of Innovation	
GNEN 6700	Management of Projects and Technological Innovation	
INFS 6560	Business Systems Analysis and Design	
OSCM 5520		
PHYS 6980	Special Topics	

No thesis is required; however, students are expected to make an oral presentation based on research and independent study.

- PLO 1: Students will analyze and solve (using the appropriate analytical techniques) any advanced graduate problem of relevance

to photovoltaics (condensed matter physics, semiconductors, materials science, materials characterization, and device physics).

- PLO 2: Students will analyze and critique the appropriateness of various manufacturing techniques used in the production of solar cells. Our students must also be able to determine the correct experimental methods to be used in analyzing the manufacturing techniques.
- PLO 3: Students will critique any publication from the area of solar cells.
- PLO 4: Students will demonstrate oral and written communication skills appropriate to the study of photovoltaics.
- PLO 5: Students will analyze which physical processes are relevant to a given system.
- PLO 6. Students will assess cause and effect in physical systems by formulating evidence-based logical arguments.
- PLO 7. Students will perform research procedures relevant to photovoltaic materials and device development and industrial implementation.
- PLO 8. Students will identify and evaluate relevant informational resources appropriate to their field of study.
- PLO 9. Students will demonstrate ethical scientific and academic conduct.
- PLO 10. Students will demonstrate collaboration skills in a scientific context, in particular, with the M.S. advisor, research group members, and at their internship.

PhD in Physics

The doctoral degree in physics is awarded to a student who has demonstrated mastery in the field of physics and a distinct and superior ability to make substantial contributions to the field. The quality of work and the resourcefulness of the student must be such that the faculty can expect a continuing effort toward the advancement of knowledge and significant achievement in research and related activities. Publication of research in peer-reviewed journals is expected. The doctoral degree in physics prepares students to enter research careers in academic, government and industrial settings. Non-research careers in a variety of areas including public policy, science communication, intellectual property law, science education, and entrepreneurship are also possible. The degree provides a foundation in one of the following areas of expertise: Astronomy and Astrophysics, Photovoltaics and Condensed Matter Physics consisting of theory and experiment, Atomic and Molecular Physics, Medical Physics, Biophysics, and Photonics. A strong training maybe expected in research methodologies and practices, rigorous hypothesis-driven scientific investigation, and the dissemination of research results and ideas through scholarly article publication, presentation at conferences, other universities and research settings. In general, work for the PhD takes five years of study beyond the bachelor's degree. A substantial portion of this time is spent in independent research leading to a dissertation. Normally 90 credit hours of study beyond the bachelor's degree are required for the PhD Students may opt to get a MS degree during their Ph.D. program.

Requirements for the Doctoral Program

For the doctor of philosophy degree, a student must complete a total of 90 hours of graduate credit including the following:

Code	Title	Hours
PHYS 7220	Classical Mechanics	3
PHYS 7250	Classical Electrodynamics I	3
PHYS 7320	Quantum Mechanics I	3
PHYS 7450	Statistical Mechanics	3
PHYS 8040	Physics and Astronomy Professional Development Seminar	1
Select at least 18 additional hours of credit in physics in courses numbered higher than 6100 approved by the student's committee		18
Dissertation research [1]		30-60
Total Hours		90

[1] 30 to 60 hours allowed for the dissertation research depending on the nature of the research and the needs of the student.

Credit in PHYS 5900, PHYS 6010/PHYS 8010, PHYS 6020/PHYS 8020, or PHYS 7910 will not count toward degree requirements.

The doctoral degree requirements include a Ph.D. qualifying examination, a comprehensive examination, and a final oral examination. Passing the qualifying examination is a prerequisite for status as a Ph.D. candidate in physics. After passing the qualifying examination, the doctoral student must select a field of specialization. A faculty committee is formed, chaired by the research adviser, to evaluate the student's progress and to establish an appropriate program of course work. This committee administers the oral comprehensive examination, after which only the dissertation research requirement remains. The graduate program ends with the student presenting the dissertation and defending it satisfactorily in an oral examination.

Ph.D. in Physics with Concentration in Astrophysics

The Ph.D. in physics with concentration in astrophysics satisfies all the requirements for the Ph.D. in physics while preparing students for a career in astronomy and astrophysics.

To fulfill the requirement of 18 hours of credit in physics courses numbered above 6100, the concentration requires:

Code	Title	Hours
PHYS 6810/7810	Stellar Astrophysics I	3
PHYS 6820/7820	Stellar Astrophysics II	3
PHYS 6830/7830	Galactic Astronomy I	3
PHYS 6840/7840	Galactic Astronomy II	3
Select two related elective courses:		6
PHYS 6710/7710		
PHYS 6720/7720		
PHYS 8860	General Relativity	
PHYS 8870	Cosmology	
Other appropriate courses		
Select one of the following:		3

PHYS 6980/8980	Special Topics (on an astrophysics-related topic)

A satisfactory dissertation in astronomy or astrophysics with a supervisor who is a member of the Ritter Astrophysical Research Center.

Total Hours **21**

Ph.D. in Physics with Concentration in Materials Science

The Ph.D. in physics with concentration in materials science satisfies all the requirements for the Ph.D. in physics while preparing students for a career in materials science.

In addition, the concentration requires:

- Two core courses in the fundamentals of materials science:

Code	Title	Hours
PHYS 8540	Structure, Defects And Diffusion	4
PHYS 8550	Thermodynamics And Phase Transformations In Condensed Systems	4
Total Hours		**8**

- Two additional elective courses in materials science and engineering chosen from a list of courses approved by the faculty in the areas of materials science and engineering; and
- A dissertation in a materials-related field with a supervisor who is a faculty member in the area of materials science and engineering.

Ph.D. in Physics with Concentration in Medical Physics

The Ph.D. in physics with concentration in medical physics satisfies all of the requirements for a Ph.D. in physics degree while preparing students for a career in medical physics. The medical physics-related courses, which total at least 27 credit hours, are provided by the College of Medicine and Life Sciences. The student's faculty advisory committee will consist of faculty members from the department of physics and astronomy and the medical physics fields. The committee may also include other members appropriate for this degree. A dissertation research project is chosen that will have relevance to both physics and medical physics. The Ph.D. requirement of 18 additional credit hours outside the core courses will be satisfied by the specified additional graduate courses in physics and in medical physics.

- PLO 1. Our students must be able to analyze and solve (using the appropriate mathematical techniques) any problem from the core areas of physics at the graduate level (Newtonian mechanics, electromagnetism, statistical mechanics, quantum theory, and relativity).
- PLO 2. Our students must be able to analyze and solve (using the appropriate mathematical techniques) any problem from their area of research (e.g., astrophysics, photovoltaics).
- PLO 3. Our students must be able to critique any publication from their research area.
- PLO 4. Our students will design and conduct new research via experimental, observational or theoretical techniques.
- PLO 5. Our students must be able to discuss and explain the results of their research to the scientific community via written and oral presentations.

College of Pharmacy & Pharmaceutical Sciences

Graduate Catalog 2026-2027

The University of Toledo College of Pharmacy and Pharmaceutical Sciences is a nationally ranked college known for its century-long tradition of educating students to become pharmacists and pharmaceutical scientists while advancing pharmaceutical knowledge. Guiding principles are personal integrity, respect for humanity and human diversity, and professionalism.

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Research Centers

- Center for Drug Design and Development

Resources

- AACP Graduate and Research Liaison Bulletins (https://www.aacp.org/)
- Centers for Disease Control (http://www.cdc.gov/)
- Graduate School (http://www.utoledo.edu/graduate/)
- National Center for Biotechnology Information (http://www.ncbi.nlm.nih.gov/)
- The National Laboratories (https://nationallabs.org/)
- NIH Listserve (http://grants.nih.gov/grants/guide/listserv.htm)
- Office of Research (http://www.utoledo.edu/research/)
- Ohio Supercomputer Center (http://www.osc.edu/)
- ScienceDaily.com (http://www.sciencedaily.com/)
- Science Next Wave (http://nextwave.sciencemag.org/)
- ScienceWise.info (http://sciencewise.info/) (http://sciencewise.info/)
- U.S. Patent Databases (http://www.uspto.gov/patft/)

Degrees/Certificates Offered

Doctor of Pharmacy, DPH (p. 262)

Doctor of Philosophy in Experimental Therapeutics (p. 254)

Doctor of Philosophy in Medicinal Chemistry (p. 247)

Master of Science in Cosmetic Science and Formulation Design (https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/pharmacy-practice/ms-cosmetic-science-and-formulation-design/)

Master of Science in Medicinal Chemistry (p. 245)

Master of Science in Forensic Toxicology (p. 252)

Master of Science in Pharmaceutical Sciences

- Health Outcomes and Value Analytics (https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/pharmacy-practice/msps-health-outcomes-and-value-analytics/)
- Industrial Pharmacy (p. 265)
- Pharmacology/Toxicology (p. 252)

Combined Degree Programs

Pharm.D./Doctor of Philosophy in Medicinal Chemistry Dual Degree (p. 242)

PharmD/Doctor of Philosophy in Experimental Therapeutics Dual Degree (p. 243)

Bachelor of Science in Pharmaceutical Sciences and Master of Science in Medicinal Chemistry (BSPS/MS) combined 5-year option (p. 246)

Bachelor of Science in Pharmaceutical Sciences and Master of Science in Pharmaceutical Sciences / Pharmacology Toxicology (BSPS/MS) combined 5-year option (p. 252)

Certificates

- Cosmetic Claims Substantiation, Graduate Certificate (p. 267)
- Cosmetic Formulation Design, Graduate Certificate (https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/pharmacy-practice/graduate-certificate-cosmetic-formulation-design/)
- Cosmetic Regulatory Affairs Graduate Certificate (p. 267)
- Clinical Outcomes and Research Foundations Graduate Certificate (p. 267)
- Pharmacy Informatics Graduate Certificate (p. 267)

College Policies (Graduate Handbook)

College Of Graduate Studies

- College of Graduate Studies (p. 407)
- College Policies and Procedures and Handbook (p. 407)
- Academic Regulations (p. 412)
- Graduate Academic Policies (https://www.utoledo.edu/policies/academic/graduate/)

Departments/Programs

- Combined Pharm.D. – Ph.D. (p. 242)
- Department of Medicinal and Biological Chemistry (p. 243)
- Department of Pharmacology (p. 248)
- Department of Pharmacy Practice (p. 255)

Combined Pharm.D. – Ph.D. Program Options

Students who are admitted to both programs separately may pursue both degrees concomitantly.

Combined Pharm.D. – Ph.D. in Medicinal Chemistry Program

Although the requirements for both programs will be met, there is some overlap and flexibility, allowing a student to complete graduate-level requirements for both degrees in six to six and a half years. In general terms, students will follow the sequence for the Pharm.D. curriculum during the first four semesters, taking one graduate-level medicinal chemistry course each semester. In the fifth semester, students will take the required Pharm.D. clerkships, with at least one clerkship rotation involving a research experience. The advisor can approve 6000-level Pharm.D. courses as Ph.D. electives. The Ph.D. requirement for MBC 6550 (Biochemistry) may be waived. Beginning with sixth semester (summer following the second year), students will complete the requirements for the Ph.D. in medicinal chemistry.

Combined Pharm.D. – Ph.D. in Experimental Therapeutics Program

Although the requirements for both programs will be met, there is some overlap and flexibility, allowing a student to complete graduate-level requirements for both degrees in six to six and a half years. In general terms, students will follow the sequence for the Pharm.D. curriculum during the first four semesters, taking one graduate-level experimental therapeutics course each semester. In the fifth semester, students will take the required Pharm.D. clerkships, with at least one clerkship rotation involving a research experience. The advisor can approve 6000-level and above Pharm.D. courses as Ph.D. electives. Beginning with sixth semester (summer following the second year in the program), students will start to complete the remaining requirements for the Ph.D. in Experimental Therapeutics.

Department of Medicinal and Biological Chemistry

The Department of Medicinal and Biological Chemistry includes primary and joint faculty with expertise across a broad range of disciplines. Faculty research interests include biochemistry, neuroscience, autoimmunity and immunology, cancer therapeutics and vaccines, inflammation and obesity, kidney and cardiovascular diseases, toxicology, organic synthesis, and targeted drug design and development. Faculty conduct research that advances the understanding of disease mechanisms and contributes to the discovery and development of new therapeutic approaches and other innovations.

The department provides access to advanced instrumentation and research facilities that support a wide range of experimental and computational approaches. These resources are available to students engaged in graduate research.

The department is associated with the Center for Drug Design and Development, a university-wide resource that supports interdisciplinary research and collaboration, including partnerships with the pharmaceutical industry.

CONTACT

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Degrees Offered

- MS in Medicinal Chemistry (p. 245)
- PhD in Medicinal Chemistry (p. 247)

Combined Degree Programs

- Pharm.D./Doctor of Philosophy in Medicinal Chemistry Dual Degree (p. 242)
- Bachelor of Science in Pharmaceutical Sciences, (p. 246)Drug Discovery and Design and Master of Science in Medicinal Chemistry (BSPS/MS) combined 5-year option (p. 246)

MBC 5100 Ethical Conduct Research
[1 credit hour]
Consideration of the scientific, ethical and legal obligations of the graduate student researcher.
Term Offered: Spring, Summer

MBC 5310 Medicinal Chemistry I: Drug Action And Design
[2 credit hours]
An introductory course presenting the basic chemical principles governing the behavior of drugs and the design of new therapeutics.
Term Offered: Fall

MBC 5380 Medicinal And Poisonous Plants
[3 credit hours]
Lecture/field course examining medicinal and harmful properties of herbals and plants using pharmacognosy, clinical trials and local plant examples.
Term Offered: Summer, Fall

MBC 5550 Physiological Chemistry I: Structure And Function Of Biological Macromolecules
[3 credit hours]
An examination of the levels of structure of proteins, nucleic acids, other biomolecules and biomolecular assemblies.
Term Offered: Fall

MBC 5552 Physiological Chemistry II Cellular Metabolism and Homeostasis
[2 credit hours]
An examination of the chemistry and regulation of metabolic processes in cells, interacting cells and tissues.
Prerequisites: MBC 3550 with a minimum grade of D- or MBC 5550 with a minimum grade of D-
Term Offered: Spring

MBC 5620 Biochemical Techniques
[2 credit hours]
A detailed study of biochemical laboratory techniques necessary for the development of novel therapeutics, including bioassays and data analysis.
Term Offered: Fall

MBC 5860 Microbiology for Pharmaceutical Professionals
[2 credit hours]
This is a lecture and laboratory course with emphasis on microorganisms that cause disease. Special attention will be paid to structures and mechanisms present in microorganisms that can be exploited to inhibit the growth and survival of these organisms in a human host.
Prerequisites: MBC 3550 with a minimum grade of D- or MBC 5550 with a minimum grade of D-
Term Offered: Spring

MBC 5900 Medicinal Chemistry Seminar
[1 credit hour]
Presentation and discussion of advanced research topics in medicinal chemistry, with an emphasis on evaluating and criticizing emerging data as a way of testing hypotheses.
Term Offered: Spring, Summer, Fall

MBC 6100 Advanced Immunology
[2 credit hours]
Readings in and critical analysis of the recent literature in immunology and basic immunologic responses, especially as considered in immunotherapy.
Term Offered: Spring, Fall

MBC 6190 Advanced Medicinal Chemistry
[4 credit hours]
Discussion of the qualitative and quantitative aspects of the design of new therapeutic agents. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids are examined.
Term Offered: Fall

MBC 6200 Biomedicinal Chemistry
[4 credit hours]
Examination of the primary literature on approaches to the design of new therapeutic agents. Recent novel directions in the design of drugs will be examined and compared.
Prerequisites: MBC 6190 with a minimum grade of D-
Term Offered: Spring

MBC 6300 Biomedicinal Chemistry Laboratory I
[1 credit hour]
Experimental research problems in biomedicinal chemistry.
Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 6550 with a minimum grade of D-)
Term Offered: Spring, Fall

MBC 6310 Biomedicinal Chemistry Laboratory II
[3 credit hours]
Additional experimental research problems in biomedicinal chemistry (see MBC 6300/8300).
Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 6550 with a minimum grade of D-)
Term Offered: Spring, Summer, Fall

MBC 6400 Cannabis Science: Plants and Products
[3 credit hours]
CS Plants & Products considers in-depth the growth of Cannabis sativa and its subspecies as well as the production and physical properties of both chemical and consumer products derived from them. Examining the factors, procedures, and techniques that make for optimal medicinal and recreational outcomes, the course is designed for learners with diverse backgrounds, interests, and intents
Term Offered: Spring, Summer, Fall

MBC 6450 Advanced Synthetic and Medicinal Chemistry
[2 credit hours]
Readings in and critical analysis of recent literature in synthetic and medicinal chemistry research.
Term Offered: Spring, Fall

MBC 6550 Biochemistry
[4 credit hours]
A consideration of the structure and function of biological macromolecules as well as the basic and regulated metabolism of cells.
Term Offered: Fall

MBC 6960 M.s. Thesis Research In Medicinal Chemistry
[1-15 credit hours]
Development and pursuit of research leading to an M.S. thesis in medicinal chemistry.
Term Offered: Spring, Summer, Fall

MBC 6980 Special Topics In Biomedicinal Chemistry
[1-5 credit hours]
Selected study of topics in medicinal chemistry. New chemical and biochemical strategies in drug design are examined in detail.
Term Offered: Spring, Summer, Fall

MBC 7100 Ethnical Conduct of Research
[1 credit hour]
Consideration of the scientific, ethical and legal obligations of the graduate student researcher.
Term Offered: Spring, Summer

MBC 7620 Biochemical Techniques
[2 credit hours]
A detailed study of biochemical laboratory techniques necessary for the development of novel therapeutics, including bioassays and data analysis.
Term Offered: Fall

MBC 7900 Medicinal Chemistry Seminar
[1 credit hour]
Presentation and discussion of advanced research topics in medicinal chemistry, with an emphasis on evaluating and criticizing emerging data as a way of testing hypotheses.
Term Offered: Spring, Summer, Fall

MBC 8100 Advanced Immunology
[2 credit hours]
Readings in and critical analysis of the recent literature in immunology and basic immunologic responses, especially as considered in immunotherapy.
Term Offered: Spring, Fall

MBC 8190 Advanced Medicinal Chemistry
[4 credit hours]
Discussion of the qualitative and quantitative aspects of the design of new therapeutic agents. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids are examined.
Term Offered: Fall

MBC 8200 Biomedicinal Chemistry
[4 credit hours]
Examination of the primary literature on approaches to the design of new therapeutic agents. Recent novel directions in the design of drugs will be examined and compared.
Prerequisites: MBC 8190 with a minimum grade of D-
Term Offered: Spring

MBC 8300 Biomedicinal Chemistry Laboratory I
[1 credit hour]
Experimental research problems in biomedicinal chemistry.
Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 8550 with a minimum grade of D-)
Term Offered: Spring, Fall

MBC 8310 Biomedicinal Chemistry Laboratory II
[3 credit hours]
Additional experimental research problems in biomedicinal chemistry (see MBC 6300/8300).
Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 8550 with a minimum grade of D-)
Term Offered: Spring, Summer, Fall

MBC 8450 Advanced Synthetic and Medicinal Chemistry
[2 credit hours]
Readings in and critical analysis of recent literature in synthetic and medicinal chemistry research.
Term Offered: Spring, Fall

MBC 8550 Biochemistry
[4 credit hours]
A consideration of the structure and function of biological macromolecules as well as the basic and regulated metabolism of cells.
Term Offered: Fall

MBC 8960 Ph.D. Dissertation Research In Medicinal Chemistry
[1-15 credit hours]
Development and pursuit of research leading to a Ph.D. dissertation in medicinal chemistry.
Term Offered: Spring, Summer, Fall

MBC 8980 Special Topics In Biomedicinal Chemistry
[1-5 credit hours]
Selected study of topics in medicinal chemistry. New chemical and biochemical strategies in drug design are examined in detail.
Term Offered: Spring, Summer, Fall

MS in Medicinal Chemistry

Satisfactory completion of a bachelor's degree in chemistry, biology, pharmacy, or a related discipline is required. Applicants are expected to have completed undergraduate coursework in differential and integral calculus, college physics, one year of general and inorganic chemistry with laboratory coursework, one year of organic chemistry with laboratory coursework, and analytical chemistry. Undergraduate coursework in physical chemistry is recommended.

Applicants must meet the minimum GPA and other admission requirements established by the College of Graduate Studies. The Graduate Record Examination (GRE) is not required for admission; however, international applicants are strongly encouraged to submit GRE scores.

Drug Discovery and Design (DDAD) Major & Master of Science (M.S.) in Medicinal Chemistry (MC) Option

Undergraduate students accepted to the B.S.P.S. in Drug Discovery and Design to Master of Science in Medicinal Chemistry (M.S. MC) Pipeline option may complete up to three graduate-level courses (nine credit hours) during their final two academic years of undergraduate study. Students admitted to the Pipeline program must apply for admission to the College of Graduate Studies for the semester in which they intend to matriculate. They will then continue into the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine credit hours) may be applied toward both undergraduate and graduate degree requirements.

It is the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, ensure that the limit of nine credit hours taken as an undergraduate is strictly enforced, and request that the College of Graduate Studies change the student's matriculation status from undergraduate to graduate once all undergraduate degree requirements have been met.

Master's students need to complete the following courses as partial fulfillment of their requirement for an M.S. degree:

Code	Title	Hours
MBC 5100	Ethical Conduct Research	1
MBC 5900	Medicinal Chemistry Seminar [1]	3-4
MBC 6190	Advanced Medicinal Chemistry	4
MBC 6960	M.s. Thesis Research In Medicinal Chemistry [2]	6-16
Electives [3]		5

1. One hour can be taken during each semester (fall or spring, not summer). A minimum of 3 credit hours are required, up to 4 count towards degree completion.
2. A minimum of 6 hours are required, up to 16 hours count toward degree completion.
3. Other 5000- to 6000-level courses should be taken as electives, as advised. A minimum of 5 hours of electives are required, but more than 5 hours can be taken and will be counted towards degree completion. Typically, students with more biological interests will take MBC 6550 and/or MBC 6200 as electives and students with more chemical interests will take CHEM 6400 and CHEM 6410.

Combined bachelor's to master's- BSPS in Drug Discovery and Design to Master's of Science in Medicinal Chemistry (MS MC)

Undergraduate students accepted to the BSPS in Drug Discovery and Design to Master's of Science in Medicinal Chemistry (MS MC) Pipeline option will be admitted to the Master's of Science in Medicinal Chemistry (MS MC) and allowed to complete up to three graduate level classes (nine credit hours) during their final two academic years of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in to the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) MBC 6190, MBC 6200, and MBC 5900 may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

The total number of credit hours at the graduate level (course numbers 5000 and 6000) including classroom courses, seminar and M.S. Thesis Research needs to be at least 30. This total can be achieved in different ways by varying the number of seminar, research and electives while maintaining the range limits for each category specified above.

In addition, the following items also must be completed:

1. Preparation of a written M.S. thesis based upon the results of an original research investigation performed by the student during the M.S. program at The University of Toledo.
2. Successful oral defense of the thesis before the thesis advisory committee (consisting of the thesis adviser and two other members) and presentation of the results of the thesis research in a seminar before the Department of Medicinal and Biological Chemistry.
3. Acceptance of this thesis by the M.S. thesis adviser and the thesis advisory committee.
4. Maintenance of a cumulative graduate GPA of 3.0 or higher.
5. One semester of experience as a teaching assistant. The program believes experience in teaching is critical to solidifying the student's understanding of the basics of the field and improving communication skills.

Program Requirements for the combined BSPS/MS in Medicinal Chemistry

The pre-professional division (year 1 and 2) requirements are the same as for the BSPS program as are the requirements for entry into the professional division. When students enter the professional division of the College of Pharmacy and Pharmaceutical Sciences they are in their P1 year (3rd year of study). The requirements for the P1 and P2 years are listed below:

Medicinal and Biological Chemistry Professional Division Curriculum

First Term		Hours
MBC 3310	Medicinal Chemistry I: Drug Action And Design	2
MBC 3330	Techniques in Pharmaceutical and Medicinal Chemistry	2
MBC 3340	Techniques in Pharmaceutical and Medicinal Chemistry Laboratory	1
PHCL 3700	Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology	3
MBC 3550	Physiological Chemistry I: Structure And Function Of Biological Macromolecules	3
Major Elective [2]		2
	Hours	**13**
Second Term		
At the beginning of the second term the student identifies a MBC faculty mentor for an in-house internship and applies for provisional acceptance to the graduate school.		
MBC 3100	Ethical Practice in Research	1
MBC 3320	Medicinal Chemistry II: Drug Design and Drug Action	3
MBC 3560	Physiological Chemistry II: Chemical Regulation Of Cells And Organisms	3
PHCL 3730	BSPS Pharmacology II: Endocrine and CNS Pharmacology	3
MBC 3880	Medicinal And Biological Chemistry Laboratory (Recommend MBC Laboratory course) [1]	3
MBC 3100	Ethical Practice in Research (Recommend Major Elective) [2]	1
MBC 4870	Biomedicinal Chemistry Laboratory (Recommend Major Elective) [2]	1-4
	Hours	**15-18**
Third Term		
MBC 4780	Internship in Medicinal Chemistry [3]	6-12
	Hours	**6-12**
Fourth Term		
MBC 4710	Targeted Drug Design [4]	3
MBC 4850	Advanced Immunology And Tissue Culture Laboratory (Recommend Major Elective) [2]	1-10
Recommended MBC4880 Laboratory or select a major elective		3
	Hours	**7-16**
	Total Hours	**41-59**

[1] The MBC major requires that 3 semester hours of laboratory instruction be taken at the 3000 level or higher in a course taught by the MBC Department. Completion of 3 semester hours of any of the

following courses will satisfy this requirement: MBC 3880, MBC 4850, MBC 4870, MBC 4880, MBC 4900, MBC 4950, or MBC 4960. MBC 3850 Microbiology & Immunology Lab, 1 semester hour credit does not satisfy this requirement ***unless*** it is taken with an additional 2 credit hours of any of the other approved laboratories listed above.

[2] To be chosen from the MBC electives list. (See College of Pharmacy and Pharmaceutical Sciences Catalogue.)

[3] Internship must be taken in the summer before the P2 year with an in house MBC faculty mentor who will then be the mentor for the M.S. degree.

*Once the B.S.P.S. degree is awarded the student can move from provisional to accepted in the graduate program. Requirements to be fulfilled for the MS MC degree are given directly above.

[4] MBC 4720, Advances in Drug Design, when offered, will also fulfill the requirement.

*At the beginning of the second semester the student identifies a MBC faculty mentor for an in-house internship and applies for provisional acceptance to the graduate school.

Graduation should be in December giving 3.5 years for the B.S.P.S. MBC degree completion. Once the B.S.P.S. degree is awarded the student can move from provisional to accepted in the graduate program. Requirements to be fulfilled for the MS MC degree are given directly above.

The student would begin the master's portion in the spring semester following the B.S.P.S. MBC graduation at the end of the Fall term, and could complete the M.S. degree by the end of the Spring semester of the following year. Therefore the two degrees, B.S.P.S. MBC and M.S. MC, could be accomplished in 5 calendar years.

- PLO 1. Interpret and critically evaluate the literature in the respective discipline and identify gaps in current knowledge.
- PLO 2. Design, implement, and analyze the results of an independent research project in the respective discipline.
- PLO 3. Communicate and defend research findings orally and in writing.
- PLO 4. Describe and comply with standards of ethical conduct of research.
- PLO 5. Collaborate effectively within a team of colleagues within the discipline.
- PLO 6. Describe new developments in the general field of pharmaceutical sciences and related fields.
- PLO 7. Negotiate with leaders in pharmaceutical sciences and related fields to secure employment.

PhD in Medicinal Chemistry

Satisfactory completion of a bachelor's degree in chemistry, biology, pharmacy or a related discipline is required. It is assumed that the undergraduate training will include differential and integral calculus, college physics, a one-year course in general and inorganic chemistry including a laboratory, a one-year course in organic chemistry including a laboratory, and training in analytical chemistry. An undergraduate course in physical chemistry is recommended.

The ability to excel in graduate studies and research must be evident based on grades from undergraduate studies, recommendations from college faculty, results from standardized aptitude and achievement examinations (Graduate Record Examination), and performance in research and independent study.

Students with M.S. degrees in medicinal chemistry or related fields may also be admitted directly to the Ph.D. program. Students without M.S. degrees may be admitted directly to the Ph.D. program, but must take 30 credits at the master's level prior to accruing doctoral level credits.

Ph.D. students need to complete the following courses as partial fulfillment of their requirement for a Ph.D. degree. Additional graduate courses (5000 to 8000 level) may be required, as advised during the development of each student's plan of study.

Code	Title	Hours
MBC 5100/7100	Ethical Conduct Research	1
MBC 5900/7900	Medicinal Chemistry Seminar ((6-8 hours, 1 each semester)) [1]	1
MBC 6190/8190	Advanced Medicinal Chemistry	4
MBC 6200/8200	Biomedicinal Chemistry	4
MBC 6300/8300	Biomedicinal Chemistry Laboratory I	1
MBC 6310/8310	Biomedicinal Chemistry Laboratory II	3
MBC 6550/8550	Biochemistry	4
MBC 8960	Ph.D. Dissertation Research In Medicinal Chemistry (minimum of 30 hours) [2]	1-15
Electives [3]		8

[1] One hour can be taken during each semester (fall or spring, not summer). A minimum of 6 hours, taken over 6 semesters, are required, up to 8 hours count towards degree completion.

[2] A minimum of 30 hours are required, but more than 30 hours can be taken and count towards degree completion.

[3] Other 5000- and above level courses should be taken as electives, as advised. A minimum of 8 hours are required, but more than 8 hours can be taken and will be counted towards degree completion. See list below.

The following is a list of recommended elective courses:

Code	Title	Hours
Chemistry Courses		
CHEM 6330	Spectroscopic Methods And Analysis Of Spectra	4
CHEM 6400/8400	Advanced Organic Chemistry	4
CHEM 6410/8410	Organic Synthesis	4
CHEM 6510/8510	Protein Chemistry	4
CHEM 6520/8520	Enzymology	4
CHEM 6530/8530		
Biology Courses		
BIOL 6010	Advanced Molecular Biology	3

BIOL 6020	Advanced Molecular Biology Laboratory	2
BIOL 6090/8090	Advanced Cell Biology	3
BIOL 6100/8100	Research Methodology: Cell And Molecular Biology	3
Medicinal and Biological Chemistry Courses		
MBC 5380	Medicinal And Poisonous Plants	3
MBC 6100/8100	Advanced Immunology	2
MBC 6450/8450	Advanced Synthetic and Medicinal Chemistry	2
Other 5000/7000 or 6000/8000 level courses as advised		

In addition, all students must satisfy the following:

1. Minimum of 60 semester hours of graduate credit beyond the master's level (course numbers 7000 and above), including a minimum of 15 hours of courses, laboratories and seminars (exclusive of dissertation research) and a minimum of 30 hours of Ph.D. dissertation research.
2. Satisfactory overall performance on a written qualifying examination covering graduate-level medicinal chemistry, biochemistry and either organic chemistry or advanced cell/molecular biology.
3. Selection of a doctoral research adviser, preparation of an acceptable written Ph.D. dissertation proposal in consultation with the adviser, and the satisfactory oral defense of the proposal before the dissertation advisory committee. The written qualifying examination and the defense of the dissertation proposal will constitute the examination requirements necessary for advancement to candidacy for the Ph.D. in medicinal chemistry. The chair of the doctoral dissertation advisory committee will be the student's doctoral research adviser. The dissertation advisory committee will consist of two additional Medicinal and Biological Chemistry Department faculty plus one member from outside the student's department or college.
4. Subsequent to admission to candidacy for the Ph.D. degree, the student is expected to spend a minimum of two semesters in full-time study at The University of Toledo.
5. Preparation of a Ph.D. dissertation based on the results of an original research investigation performed by the student during his/her Ph.D. program at The University of Toledo.
6. Presentation of the results of the dissertation research in a public seminar before the Department of Medicinal and Biological Chemistry and successful oral defense of the dissertation before the dissertation advisory committee.
7. Acceptance of the dissertation by the Ph.D. dissertation adviser and the dissertation advisory committee.
8. Maintenance of a cumulative graduate GPA of 3.0 or higher.
9. Three semesters of experience as a teaching assistant. The program believes experience in teaching is critical to solidifying the student's understanding of the basics of the field and improving communication skills.

- PLO 1. Interpret and critically evaluate literature in the respective discipline and identify gaps in current knowledge.
- PLO 2. Design, implement, and analyze the results of an independent research project in the respective discipline.
- PLO 3. Communicate and defend research findings orally and in writing.
- PLO 4. Describe and comply with standards of ethical conduct of research.
- PLO 5. Collaborate effectively within a team of colleagues within the discipline.
- PLO 6. Describe new developments in the general field of pharmaceutical sciences and related fields
- PLO 7. Negotiate with leaders in pharmaceutical sciences and related fields to secure employment.
- PLO 8. Demonstrate ability to independently design and plan a research program.
- PLO 9. Execute a research program in the area of specialization.

Department of Pharmacology and Experimental Therapeutics

Pharmacology is the science concerned with the origin, nature, chemistry, effects, and uses of drugs. It encompasses pharmacokinetics, pharmacodynamics, pharmacotherapeutics, and toxicology. Pharmacology addresses the study of drugs in all aspects, including their properties, mechanisms of action, therapeutic uses, discovery and development, and biological and physiological effects, including adverse reactions and side effects. The field also examines the body's effects on drugs, including their absorption, distribution, metabolism, and excretion.

ABOUT THE DEPARTMENT OF PHARMACOLOGY & EXPERIMENTAL THERAPEUTICS

The Department of Pharmacology and Experimental Therapeutics integrates basic and applied research in the pharmaceutical sciences into its academic programs and contributes to the education and training of students across the College.

The department contributes to the Doctor of Pharmacy (Pharm.D.) program and the Drug Discovery and Design major within the Bachelor of Science in Pharmaceutical Sciences (B.S.P.S.) program. The department also offers graduate programs, including a Master of Science in Pharmaceutical Sciences with a concentration in Pharmacology/Toxicology, a Master of Science in Forensic Toxicology, and a Doctor of Philosophy (Ph.D.) in Experimental Therapeutics.

Departmental coursework spans a broad range of disciplines, including pharmacology, toxicology, pharmacokinetics, toxicokinetics, forensic toxicology, and experimental therapeutics. Faculty research interests include neuropharmacology, molecular pharmacology, drug metabolism, polycystic kidney disease, the use of zebrafish models in drug discovery and testing, and toxicology.

CONTACT US

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Degrees Offered

- M.S. in Forensic Toxicology (p. 252)
- M.S. in Pharmacology and Toxicology (p. 252)
- PhD in Experimental Therapeutics (p. 254)

Combined Degree Programs

PharmD/Doctor of Philosophy in Experimental Therapeutics Dual Degree (p. 242)

PHCL 5100 Experimental Therapeutics I
[3 credit hours]
The course will cover the application of basic principles of pharmacology to the development of new therapies for human disease. A primary focus will be the translation of laboratory discoveries into clinical applications.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 5200 Experimental Therapeutics II
[3 credit hours]
The course will expand upon material covered in Experimental Therapeutics I and focus on the drug development process. Practical applications include the design of in vitro and in vivo screens for drug activity, improvement of pharmacokinetic properties and integration of medicinal chemistry with pharmacology in a drug development paradigm.
Prerequisites: PHCL 5100 with a minimum grade of B-
Term Offered: Spring

PHCL 5440 Current Topics in Interpretation of Pharmaceutical Data
[1 credit hour]
The basic statistical techniques learned in PHCL 5140 will be further explored using research articles and real data sets to conduct statistical analyses. The use of different software programs will be used to provide students with hands-on practice in conducting statistical analyses.
Prerequisites: PHCL 5140 (may be taken concurrently) with a minimum grade of B-
Term Offered: Summer

PHCL 5460 Current Topics in Pharmacokinetics Toxicokinetics
[1 credit hour]
An advanced discussion of the theory and practice of using kinetic principles to model the time course of drugs and toxic chemicals in the body and in the environment. The student should understand the relationship between chemical time courses and outcomes and application to risk assessment. Additionally, students will gain hands-on practice using kinetic analysis methods and software.
Prerequisites: PHCL 4760 with a minimum grade of B- or PHCL 5760 (may be taken concurrently) with a minimum grade of B-
Term Offered: Spring, Fall

PHCL 5500 From Experimental to Applied Therapeutics
[4 credit hours]
The course focuses on bridging the gap between experimental and clinical applications of drugs. It will discuss groups of structurally related drugs designed to treat certain conditions, their basic molecular pharmacological action and how that is applied clinically. The course will also include discussing toxicity of some drugs and xenobiotics manufactured for certain applications, their basic molecular actions and their clinical toxicity.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 5700 Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology
[3 credit hours]
An introduction to the principles of pharmacology and the pharmacology of the autonomic nervous system."
Term Offered: Fall

PHCL 5720 Pharmacology II: Endocrine And Cns Pharmacology
[3 credit hours]
The pharmacology of drugs acting upon the endocrine and reproductive systems will be discussed, followed by a treatment of drugs used in the management of sleep disorders, anxiety, affective illness, schizophrenia and seizure disorders.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 with a minimum grade of C
Term Offered: Spring

PHCL 5730 Principles and Systems Toxicology
[3 credit hours]
This course reviews the basic elements of toxicology. It includes those principles most frequently involved in a full understanding of toxicologic events, such as dose-response, lethal dose-50 (LD50) and margin of safety. It also identifies toxic chemicals and their systemic sites and mechanisms of action. Finally, this course provides information about the kinds of toxic injuries produces in specific organs or systems and the toxic agents that produce these effects. Information about the possible management of some cases of intoxication or poisonings by some agents will be briefly reviewed.
Term Offered: Fall

PHCL 5750 Toxicology II
[3 credit hours]
This course provides the students with an overview of environmental toxicology, which emphasizes both air and water pollution. It also reviews the applications of different areas of toxicology, such as food toxicology emphasizing the safety standards of food and methods of evaluation of food safety, analytic toxicology and its applications in forensic toxicology, and occupational toxicology, emphasizing the health effects of industrial chemicals on workers. General methodologies for toxicity testing are also discussed.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 with a minimum grade of C
Term Offered: Spring

PHCL 5760 Toxicokinetics
[3 credit hours]
This course introduces the student to basic concepts involved in the absorption, distribution, metabolism, and elimination of medications in the body. The dynamics of various pharmacokinetic processes will be expounded by means of various parameters and models. The student will apply mathematical formalisms to calculate various pharmacokinetic parameters to further formulate and design individualized dosage regimens.
Term Offered: Spring, Summer, Fall

PHCL 5770 Current Topics in Toxicology I
[1 credit hour]
The course focuses on the most recently published studies that cover advances in the field of toxicology, including risk assessment of toxic chemicals, toxicokinetics, chemically ¿induced mutations, cancer and developmental toxicity, toxic responses of various body systems to different chemicals and drugs, toxicity of pesticides and heavy metals.
Prerequisites: PHCL 4730 with a minimum grade of B- or PHCL 5730 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 5800 Principles and Methods of Forensic Toxicology
[3 credit hours]
Introduction to the goals and methods of forensic toxicology, including post-mortem forensic toxicology, human performance forensic toxicology, and forensic toxicology testing. Introduction to the general methods used to analyze different types of sample types and analytes in forensic toxicology.
Term Offered: Spring, Summer, Fall

PHCL 5810 Laboratory Quality Assurance and Quality Control
[3 credit hours]
This course teaches the principles of quality assurance and quality control as they apply to the laboratory sciences. These approaches include standards and controls, written procedures, and method validation used in biological, pharmacological, toxicological and forensic sciences.
Term Offered: Spring, Summer, Fall

PHCL 5990 Problems In Pharmacology
[1-6 credit hours]
Tutorial or directed individual research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 6160 Biopharmaceutics & Pharmacokinetics
[3 credit hours]
This course will provide the theoretical basis and clinical application of pharmacokinetics as relates to drug dosing, absorption, distribution, biotransformation, and excretion.
Term Offered: Spring

PHCL 6300 Research Experience in Experimental Therapeutics
[2-6 credit hours]
The course is intended for laboratory rotations to familiarize students with research topics in various clinical/basic science laboratories. A primary focus is to allow students to shadow, learn, experience and perform specific laboratory techniques.
Term Offered: Spring, Summer, Fall

PHCL 6320 NEUROLOGICAL AND PSYCHIATRIC PHARMACOLOGY
[1 credit hour]
A course analyzing the pharmacology of neurologically based attributes and disorders.
Corequisites: MBC 6320, PHPR 6140
Term Offered: Spring

PHCL 6390 Problems in Experimental Therapeutics
[1-6 credit hours]
The course will examine current topics and trends in the field of experimental therapeutics. The nature of the course will vary from student to student, depending on their background in the field, and the nature of their interest. For example, a new student may be assigned a literature search to identify papers that describe current approaches toward the treatment of human disease. A more advanced student might be given the task of researching and developing new laboratory techniques to initiate a research project. The overall goal will be to introduce students to current problems in experimental therapeutics, and help them identify an approach toward solving these problems.
Term Offered: Spring, Summer, Fall

PHCL 6400 Cannabis Science – Risks & Benefits
[3 credit hours]
Cannabis Science – Risks and Benefits – delves into the pharmacology, biochemistry, pharmacokinetics, and toxicology of cannabis products. The course will also cover the neuropsychopharmacology of cannabis and the effects of short term and long term uses of cannabis in the central nervous and peripheral systems.
Term Offered: Spring, Fall

PHCL 6600 Seminar In Pharmacology
[1 credit hour]
Pharmacology students will attend seminar presentations offered in the departments of , and must present at least one seminar.
Term Offered: Fall

PHCL 6650 Seminar in Experimental Therapeutics
[2 credit hours]
The course includes seminars presented by scientists from academia, industry and government who are invited by the department to speak about their research. Research subjects to be covered by the seminars are within the field of therapeutics and related areas, such as toxicology, molecular and genetic mechanisms in drug/chemical action, risk assessment, biomarkers and others.
Term Offered: Spring, Fall

PHCL 6700 Pharmacology III: Cns And Cardiovascular/Renal Pharmacology
[3 credit hours]
The pharmacology of central nervous system active agents . Agents acting on the cardiovascular and renal systems are discussed.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of C
Term Offered: Fall

PHCL 6710 Fundamentals of Biostatistics and Research Analysis
[3 credit hours]
This course discusses biostatistical analysis, evaluation of peer-reviewed literature, and interpreting research concepts, methods, data, and outcomes in preparation for the cosmetic science project.
Term Offered: Summer, Fall

PHCL 6720 Pharmacology IV; Chemotherapeutics
[3 credit hours]
The pharmacology of anti-infective chemotherapeutic agents is presented. Issues such as the mechanism of antimicrobial action, disposition, resistance and problems attending the use of antimicrobial drugs will be discussed.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 with a minimum grade of C
Term Offered: Spring

PHCL 6800 Drug Metabolism and Molecular Toxicology
[3 credit hours]
This course teaches the principles of molecular toxicology and considers how drug metabolism produces and limits toxicity. Mechanism of biotransformation of drugs and other xenobiotics, and the contributions of these mechanisms to drug toxicity are explored
Term Offered: Spring, Summer, Fall

PHCL 6810 Forensic Toxicology and the Law
[3 credit hours]
Consideration of the legal principles and procedures underlying the application of forensic toxicology.
Term Offered: Spring, Summer, Fall

PHCL 6820 Forensic Toxicology Capstone
[3 credit hours]
In this capstone course for the MS in forensic toxicology students will research a topic of interest under the direction of a faculty mentor.
Term Offered: Spring, Summer, Fall

PHCL 6900 M.s. Thesis Research In Pharmacology
[1-6 credit hours]
M.S. thesis research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 6920 M.s. Thesis Research In Pharmacology
[1-6 credit hours]
M.S. thesis research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 7100 Experimental Therapeutics I
[3 credit hours]
The course will cover the application of basic principles of pharmacology to the development of new therapies for human disease. A primary focus will be the translation of laboratory discoveries into clinical applications.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 7200 Experimental Therapeutics II
[3 credit hours]
The course will expand upon material covered in Experimental Therapeutics I and focus on the drug development process. Practical applications include the design of in vitro and in vivo screens for drug activity, improvement of pharmacokinetic properties and integration of medicinal chemistry with pharmacology in a drug development paradigm.
Prerequisites: PHCL 5100 with a minimum grade of B- or PHCL 7100 with a minimum grade of B-
Term Offered: Spring

PHCL 7440 Current Topics in Interpretation of Pharmaceutical Data
[1 credit hour]
The basic statistical techniques learned in PHCL 4140/5140 will be further explored using research articles and real data sets to conduct statistical analyses. The use of different software programs will be used to provide students with hands-on practice in conducting statistical analyses.
Prerequisites: PHCL 5140 (may be taken concurrently) with a minimum grade of B-
Term Offered: Summer

PHCL 7460 Current Topics in Pharmacokinetics Toxicokinetics
[1 credit hour]
An advanced discussion of the theory and practice of using kinetic principles to model the time course of drugs and toxic chemicals in the body and in the environment. The student should understand the relationship between chemical time courses and outcomes and application to risk assessment. Additionally, students will gain hands-on practice using kinetic analysis methods and software.
Prerequisites: PHCL 4760 with a minimum grade of B- or PHCL 5760 (may be taken concurrently) with a minimum grade of B-
Term Offered: Spring, Fall

PHCL 7500 From Experimental to Applied Therapeutics
[4 credit hours]
The course focuses on bridging the gap between experimental and clinical applications of drugs. It will discuss groups of structurally related drugs designed to treat certain conditions, their basic molecular pharmacological action and how that is applied clinically. The course will also include discussing toxicity of some drugs and xenobiotics manufactured for certain applications, their basic molecular actions and their clinical toxicity.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 7770 Current Topics in Toxicology I
[1 credit hour]
The course focuses on the most recently published studies that cover advances in the field of toxicology, including risk assessment of toxic chemicals, toxicokinetics, chemically ¿induced mutations, cancer and developmental toxicity, toxic responses of various body systems to different chemicals and drugs, toxicity of pesticides and heavy metals.
Prerequisites: PHCL 4730 with a minimum grade of B- or PHCL 5730 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 8300 Research Experience in Experimental
[2-6 credit hours]
The course is intended for laboratory rotations to familiarize students with research topics in various clinical/basic science laboratories. A primary focus is to allow students to shadow, learn, experience and perform specific laboratory techniques.
Term Offered: Spring, Summer, Fall

PHCL 8390 Problems in Experimental Therapeutics
[1-6 credit hours]
The course will examine current topics and trends in the field of experimental therapeutics. The nature of the course will vary from student to student, depending on their background in the field, and the nature of their interest. For example, a new student may be assigned a literature search to identify papers that describe current approaches toward the treatment of human disease. A more advanced student might be given the task of researching and developing new laboratory techniques to initiate a research project. The overall goal will be to introduce students to current problems in experimental therapeutics, and help them identify an approach toward solving these problems.
Term Offered: Spring, Summer, Fall

PHCL 8650 Seminar in Experimental Therapeutics
[2 credit hours]
The course includes seminars presented by scientists from academia, industry and government who are invited by the department to speak about their research. Research subjects to be covered by the seminars are within the field of therapeutics and related areas, such as toxicology, molecular and genetic mechanisms in drug/chemical action, risk assessment, biomarkers and others.
Term Offered: Spring, Fall

PHCL 8960 Dissertation Research in Experimental Therapeutics
[1-15 credit hours]
The course entails laboratory and/or clinical research focused on the development of experimental therapeutics directed toward human disease. Students engaged in PH.D. dissertation research will identify a significant research problem and develop a strategy for addressing an area of unmet need. Together with the major advisor and dissertation committee members, the student will develop a research plan that addresses major questions in the chosen field using an hypothesis driven approach.
Term Offered: Spring, Summer, Fall

M.S. in Forensic Toxicology

Code	Title	Hours
PHCL 5730	Principles and Systems Toxicology	3
PHCL 5760	Toxicokinetics	3
PHCL 5810	Laboratory Quality Assurance and Quality Control	3
PHCL 5800	Principles and Methods of Forensic Toxicology	3
PHCL 6710	Fundamentals of Biostatistics and Research Analysis	3
PHCL 6800	Drug Metabolism and Molecular Toxicology	3
PHCL 6810	Forensic Toxicology and the Law	3
PHCL 6820	Forensic Toxicology Capstone	3
PHM 5100	Research in Pharmaceutical Science: Ethics & Methods	3
PHM 5110	Clinical Trials and Regulatory Affairs	3

Combined bachelor's to master's - Drug Discovery and Design, BSPS to Forensic Toxicology, MSPS

Undergraduate students accepted to the Drug Discovery and Design, BSPS option will be admitted to the Forensic Toxicology, MSPS and allowed to complete up to three graduate level classes (nine credit hours) during their final two academic years of undergraduate studies. Students admitted to the pipeline program must apply for admission to the College of Graduate Studies for the semester in which they intend to matriculate. They will then continue into the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to the completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) PHM 5100**,** PHM 5110**,** and PHCL 6710 may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

- PLO 1. Describe and comply with standards of ethical conduct of research.
- PLO 2. Develop a novel research project while applying pharmaceutical science knowledge and skills to solve problems.
- PLO 3. Apply knowledge and skills of pharmaceutical sciences while working in a team format.
- PLO 4. Interpret and critically evaluate literature in pharmaceutical science disciplines while identifying gaps in current knowledge.
- PLO 5. Apply pharmaceutical science principles while designing, implementing, and analyzing the results of an independent research project in a discipline.
- PLO 6. Propose and defend novel research in both written and oral forms.

M.S. in Pharmacology and Toxicology

The Master of Science in pharmaceutical sciences degree is designed to prepare an individual for responsibilities in professional practice, the pharmaceutical industry and scientific research beyond those possible with a baccalaureate.

Although a single degree is conferred, specialization is possible in that the curriculum is organized into three distinct disciplines, referred to here as "options". Applicants must select the program of study (option) they wish to pursue. The options available to graduate students are:

- pharmacology/toxicology,
- health outcomes and and value analytics, and
- industrial pharmacy.

The requirements for the Master of Science in pharmaceutical sciences degree differ according to the option. The minimum course work for the industrial pharmacy major is 24 semester hours, for the pharmacology/toxicology major 28 semester hours and for the health outcomes and and value analytics, major 27 semester hours. In addition, each major requires a minimum of 6 semester hours of thesis research.

In general, a baccalaureate in the sciences is required for admission, although applicants possessing other bachelor's degrees will be considered if the latter represent adequate preparation. Certain options and graduate courses require undergraduate preparation as prerequisites, and this preparation should be completed as soon as possible upon admission. The total time required for completion of the graduate program leading to the Master of Science in pharmaceutical sciences degree will depend upon the preparation of the student entering the program. Normally two years of study and research are required.

The admission requirements of the College of Graduate Studies of the University apply. The basic requirement is a 2.7 (on a 4.0 scale) GPA on all undergraduate work leading to the bachelor's degree. Applicants having less than a 2.7 GPA on all undergraduate work will be considered for admission if other criteria for estimation of potential success in graduate studies are positive.

Each student must submit three copies of transcripts, one of which must be official and show all post-secondary academic work and degrees granted, three letters of recommendation from college faculty members acquainted with the applicant's character and ability. The Graduate Record Exam (GRE) is not required for admission, but is highly recommended for International students.

International students are required to take an English language test (https://www.utoledo.edu/graduate/prospectivestudents/admission/guidelines.html), which will be given in their own country by the Educational Testing Service.

Normally, acceptance will be decided by April 1 for admission during the following fall semester. The priority deadline for completed applications is January 15th. Complete applications received by this deadline will be considered for admission. Applications received after the January 15th deadline may also be considered, if positions are available in a program. International students are encouraged to submit applications one month prior to the stated deadline to allow for delays in international correspondence.

Code	Title	Hours
Undergraduate Courses Required (or their equivalents)		
CHEM 3710	Physical Chemistry For The Biosciences I	3
CHEM 3720	Physical Chemistry For The Biosciences II	3
MATH 1750	Calculus For The Life Sciences With Applications I	4
MATH 1760	Calculus For The Life Sciences With Applications II	3
MBC 3310	Medicinal Chemistry I: Drug Action And Design	2
MBC 3320	Medicinal Chemistry II: Drug Design and Drug Action	3
PHCL 2610	Introductory Physiology	3
Graduate Courses Required		
PHM 5100	Research in Pharmaceutical Science: Ethics & Methods	3
PHM 5110	Clinical Trials and Regulatory Affairs	3
PHCL 5700	Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology	3
PHCL 5720	Pharmacology II: Endocrine And Cns Pharmacology	3
PHCL 5730	Principles and Systems Toxicology [5]	3
PHCL 6600	Seminar In Pharmacology [1]	1
PHCL 6700	Pharmacology III: Cns And Cardiovascular/Renal Pharmacology	3
PHCL 6710	Fundamentals of Biostatistics and Research Analysis	3
PHCL 6900	M.s. Thesis Research In Pharmacology [2]	1-6
Elective Course Work		
Select up to 5 credits of the following: [3]		
PHCL 5750	Environmental, Food, and Analytical Toxicology	3
PHCL 5990	Problems In Pharmacology [4]	1-6
PHCL 6720	Pharmacology IV; Chemotherapeutics	3
PHCL 6160	Biopharmaceutics & Pharmacokinetics	3

1. 1 credit hour can only be taken for BSPS/MSPS combined degree.
2. 6 credit hours are the required minimum; more than 6 credit hours can be taken.
3. Other electives may be recommended by the department graduate committee.
4. May replace PHCL 5700, PHCL 5720, PHCL 5730, PHCL 6700, PHCL 6720, and PHCL 5760 if these were taken at UT at the undergraduate level as PHCL 3700, PHCL 3730, PHCL 4730, PHCL 4810, PHCL 4820 and PHCL 4760, respectively, and a grade of B- or above was received for the course.
5. Not taken if passed in undergraduate level (PHCL 4730) and passed with a B- or better

BSPS-MSPS in Pharmaceutical Sciences – PTox

The combination of BSPS and MSPS degrees in PTox gives students the ability and choice to elect to get two degrees in five years. Currently, BSPS students will take 3.5-4 years to graduate and MSPS students will take 2 years. This will take up to 1 year off of the combined BS-MSPS degree.

All BSPS degree requirements remain intact. The student electing this program will need to achieve two things. First, the student taking classes that are required courses in the BSPS curriculum are also taking most of what is required in the MSPS curriculum in PTox. Classes that are required in BSPS that may be waived for the Master's curriculum with an achieved grade of B- or better will be:

Code	Title	Hours
PHCL 5700	Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology	3
PHCL 5720	Pharmacology II: Endocrine And Cns Pharmacology	3
PHCL 5730	Principles and Systems Toxicology	3
PHCL 6700	Pharmacology III: Cns And Cardiovascular/Renal Pharmacology	3
Total Hours		**12**

This will leave the internship which must then be done in the summer between P1 and P2. To fulfill both the internship and degree credit requirements, this must be 9-12 credits during this summer. The student must do the internship and the Master's degree program thesis with the same PI. This allows ideas and training done in the internship phase to be carried forward in the Master's degree program.

Master's degree program students in this combined degree curriculum will be starting in the spring after graduation in December (9 credits). The Master's program will go through the summer (4-6 credits), following fall (9 credits) and spring (9 credits), and a possible 3 credit summer where the students would defend.

BSPS –MS Law (available with BSPS in Pharmacology/Toxicology, Medicinal Chemistry, and Cosmetic Science)

This is a 4+1 combined degree program between the BSPS and the MS in Law. Students accepted into this program will carry out the requirements for their BSPS degree, take their internship in the summer between Junior and Senior years, and be eligible to take up to 9 credit hours of graduate level courses in the MS in Law program. Application is made in the summer between Junior and Senior years, to be eligible to take graduate courses in the senior year. The rest of the masters is taken in the year following graduation with the BSPS and fulfills the requirements of the Master's in Law program (30 total credits, etc.).

- PLO 1. Describe and comply with standards of ethical conduct of research.
- PLO 2. Develop a novel research project while applying pharmaceutical science knowledge and skills to solve problems.
- PLO 3. Apply knowledge and skills of pharmaceutical sciences while working in a team format.
- PLO 4. Interpret and critically evaluate literature in pharmaceutical science disciplines while identifying gaps in current knowledge.
- PLO 5. Apply pharmaceutical science principles while designing, implementing, and analyzing the results of an independent research project in a discipline.
- PLO 6. Propose and defend novel research in both written and oral forms

PhD in Experimental Therapeutics

Experimental therapeutics integrates basic and applied sciences to advance the understanding of human disease and the development of new therapies. Research in this field examines disease processes from the molecular level to the whole organism to inform the development of rational approaches to pharmacological treatment. This work involves systematic investigation across increasing levels of biological complexity, from individual molecules and proteins to cellular and tissue-based models and whole organisms. The Ph.D. program in Experimental Therapeutics prepares students to conduct independent research and translate laboratory discoveries into advances in the prevention, diagnosis, and treatment of human disease.

Satisfactory completion of a bachelor's degree in chemistry, biology, pharmaceutical sciences, pharmacy, or a related discipline is required. Applicants must demonstrate the ability to excel in graduate study and research based on their undergraduate academic performance, recommendations from college faculty, and performance in research and independent study. The Graduate Record Examination (GRE) is not required for admission; however, international applicants are strongly encouraged to submit GRE scores.

Students with an M.S. degree in pharmacology or a related field (e.g., pharmaceutical sciences) may also be admitted to the program. These students are expected to have completed a minimum of 30 graduate-level credits as part of their master's degree before accruing doctoral-level credits.

Code	Title	Hours
PHCL 5700	Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology [1]	3
PHCL 5100/7100	Experimental Therapeutics I	3
PHCL 5200/7200	Experimental Therapeutics II	3
PHCL 5770/7770	Current Topics in Toxicology I [2]	1
PHCL 6650/8650	Seminar in Experimental Therapeutics (Minimum 6 hours required)	2
PHCL 5460/7460	Current Topics in Pharmacokinetics Toxicokinetics [3]	1
PHCL 5440/7440	Current Topics in Interpretation of Pharmaceutical Data [4]	1
PHCL 6300/8300	Research Experience in Experimental Therapeutics [5]	2-6
PHCL 8960	Dissertation Research in Experimental Therapeutics [6]	1-15
INDI 6020/8020	On Being a Scientist	1
MBC 6190/8190	Advanced Medicinal Chemistry	4
or		
PHCL 5500/7500	From Experimental to Applied Therapeutics	4

1 Not required if this same course, or PHCL 3700 or equivalent was taken previously. If taken by Masters' students admitted to the program with eligibility to take 7/8 level courses, the PHCL 5700 credit will not count toward those credits required for the Ph.D. degree.

2 Requires PHCL 4730 or PHCL 5730 as pre-requisite or PHCL 5730 as co-requisite. If PHCL 5730 taken by Masters' students admitted to the program with eligibility to take 7/8 level courses, the credit for this course will not count toward those required for the Ph.D. degree.

3 Requires PHCL 4160 or PHCL 6160 as pre-requisite or PHCL 6160 as co-requisite. If PHCL 6160 taken by Masters' students admitted to the program with eligibility to take 7/8 level courses, the credit for this course will not count toward those required for the Ph.D. degree.

4 Requires PHCL 6710 as pre- or co-requisite. If taken by Masters' students admitted to the program with eligibility to take 7/8 level courses, the credit for this course will not count toward those required for the Ph.D. degree.

5 To fulfill the required laboratory rotations, a minimum of 4 hours must be taken in two different sections of the course (2 hours in each).

6 A minimum of 30 hours is required.

Additional Requirements

In addition, all students must satisfy the following:

1. Minimum of 90 semester hours of graduate credit, including a minimum of 30 semesters hours at the Masters level, and a Minimum of 60 semester hours of graduate credit beyond the master's level. The required minimum 60 credits beyond the Masters level should include a minimum of 30 hours of Ph.D. dissertation research.
2. Students admitted with a minimum of 30 semester hours at a Masters level should sign up for 7/8 level classes, if their Masters degree was conferred by a USA university. Students admitted with a Bachelor's degree or a foreign graduate degree should sign up for 5/6 level classes for the first 30 credit, and for 7/8 level classes thereafter.
3. With the approval of the department graduate committee, certain courses taken in a foreign university may be considered as equivalent to some of the program courses or for full-filling pre-requisite requirements
4. A grade of B- or higher is expected to be maintained for the required courses. A grade of B- or higher is also required for all of the pre-requisite courses.
5. A cumulative graduate GPA of 3.0 or higher must be maintained.
6. Satisfactory overall performance is expected on a written qualifying examination, which is administered after completion of the required graduate courses for that exam. The qualifying examination covers the following graduate courses, including their pre- and/or co-requisites:
7. Selection of a doctoral research adviser, preparation of an acceptable written Ph.D. dissertation proposal in consultation with the adviser, and the satisfactory oral defense of the proposal before the dissertation advisory committee. The written qualifying examination and the defense of the dissertation proposal will constitute the examination requirements necessary for advancement to candidacy for the Ph.D. in Experimental Therapeutics. The chair of the doctoral dissertation advisory committee will be the student's doctoral research adviser. The dissertation advisory committee will consist of at least two additional faculty members plus one member from outside the student's department or college.
8. Subsequent to admission to candidacy for the Ph.D. degree, the student is expected to spend a minimum of two semesters in full-time study at The University of Toledo.
9. Preparation of a Ph.D. dissertation based on the results of an original research investigation performed by the student during his/her Ph.D. program at The University of Toledo.
10. Successful oral defense of the dissertation before the dissertation advisory committee and presentation of the results of the dissertation research in a seminar before the department of pharmacology.
11. Acceptance of the dissertation by the Ph.D. dissertation adviser and the dissertation advisory committee.

- PLO 1. Interpret and critically evaluate the literature in the respective discipline and identify gaps in current knowledge.
- PLO 2. Design, implement, and analyze the results of an independent research project in the respective discipline.
- PLO 3. Effectively communicate and defend research findings orally and in writing.
- PLO 4. Describe and comply with standards of ethical conduct of research, including the use of experimental subjects.
- PLO 5. Effectively work in a team of colleagues within the discipline.
- PLO 6. Teach and mentor other researcher.
- PLO 7. Write a competitive application for research funding.
- PLO 8. Produce publishable research.

Department of Pharmacy Practice

The department includes tenured and tenure-track faculty, lecturer faculty, and staff who contribute to undergraduate and graduate education, postgraduate training, research and scholarship, patient care, and professional service. The department also works with a broad network of pharmacists and other healthcare professionals who contribute to the educational mission by serving as preceptors for introductory and advanced pharmacy practice experiences and scientific internships.

Faculty expertise spans pharmacy practice, pharmaceutics and industrial pharmacy, cosmetic science and formulation design, and health outcomes and value analytics. Faculty engage in research, scholarship, patient care, and professional activities that support the missions of the College and University.

Department faculty provide patient care and engage in professional practice across a variety of healthcare and pharmacy practice settings.

Cosmetic Science and Formulation Design

Cosmetic science and formulation design is a multidisciplinary applied science that integrates scientific, technical, and business principles related to cosmetics and personal care products. Students study the development, formulation, production, and evaluation of cosmetic and personal care products, as well as regulatory requirements and methods used to assess product safety, performance, and quality.

Alison Wery, Assistant Lecturer
Director of the Online MS Cosmetic Science and Formulation Design Program
alison.wery@utoledo.edu (Alison.Wery@UToledo.edu)

Health Outcomes and Value Analytics

Health Outcomes and Value Analytics is an academic area within the department that includes faculty with expertise in social and behavioral sciences, pharmacoeconomics, health outcomes research, and healthcare analytics. Faculty in this area contribute to undergraduate and graduate education and support graduate training focused on health outcomes and value analytics.

Dr Varun Vaidya, Professor
Director of the Online MS Health Outcomes and Value Analytics Program
varun.vaidya@utoledo.edu

Pharmaceutics and Industrial Pharmacy

Pharmaceutics and Industrial Pharmacy is an academic area within the department that focuses on the development, formulation, manufacturing, and evaluation of pharmaceutical products. Students gain knowledge and skills in areas such as preformulation evaluation, dosage form design, stability testing, scale-up, and pharmaceutical production.

Dr. Jerry Nesamony, Professor
Director of the MSPS Industrial Pharmacy Program
jerry.nesamony@utoledo.edu

Degrees Offered

- Doctor of Pharmacy (PharmD) (DPH) (p. 262)
- Master of Science in Cosmetic Science and Formulation Design
- MSPS in Health Outcomes and Health Analytics
- MSPS in Industrial Pharmacy (p. 265)
- Clinical Outcomes and Research Foundations Graduate Certificate (p. 267)
- Cosmetic Claims Substantiation Graduate Certificate (p. 267)
- Cosmetic Formulation Design Graduate Certificate (https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/pharmacy-practice/graduate-certificate-cosmetic-formulation-design/)
- Cosmetic Regulatory Affairs Graduate Certificate (p. 267)
- Pharmacy Informatics Graduate Certificate (p. 267)

PHM 5000 Integrated Pharmaceutical and Clinical Sciences 1
[6 credit hours]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis and treatments. The course focuses on clinical laboratory tests and monitoring, hypertension, hyperlipidemia, diabetes and endocrine related disorders.
Prerequisites: MBC 5310 with a minimum grade of D- and PHCL 5700 with a minimum grade of D-
Corequisites: PHPR 5460
Term Offered: Spring

PHM 5100 Research in Pharmaceutical Science: Ethics & Methods
[3 credit hours]
Advanced consideration of scientific, ethical, and legal obligations expected in the conduct of research. Thereafter, an introduction to research methods and principles used in designing, planning, implementing, analyzing, and interpreting research projects in pharmaceutical sciences.
Term Offered: Spring, Summer

PHM 5110 Clinical Trials and Regulatory Affairs
[3 credit hours]
This course teaches the principles of clinical trials. This includes theoretical and practical applications of clinical trials as they apply to the drug approval process, and regulatory issues as they apply to human subjects research and the approval of drugs for use in humans.
Term Offered: Spring, Summer, Fall

PHM 6000 Integrated Pharmaceutical and Clinical Sciences 4
[7 credit hours]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of fluids, electrolytes and kidney disease, cardiology and gastrointestinal disorders.
Term Offered: Fall

PHM 6200 Integrated Pharmaceutical and Clinical Sciences 5
[5 credit hours]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of oncology and special populations related disorders.
Corequisites: PHPR 6470
Term Offered: Spring

PHM 6400 Physical and Mental Effects of Psychoactive Substances
[2 credit hours]
Pharmacology, pathophysiology, social impact of substance use, mis-use, and abuse and treatments available (pharmacological and non-pharmacological). Legal issues surrounding substance use, mis-use, and abuse will also be discussed.
Term Offered: Summer, Fall

PHM 6500 Integrated Pharmaceutical and Clinical Sciences 2
[8 credit hours]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of immunologic disorders, pharmacokinetic considerations and infectious diseases.
Prerequisites: MBC 5310 with a minimum grade of D- and PHCL 5700 with a minimum grade of D- and PHCL 6160 with a minimum grade of D- and PHM 5000 with a minimum grade of D-
Corequisites: PHPR 6350
Term Offered: Fall

PHM 6600 Integrated Pharmaceutical and Clinical Sciences 3
[8 credit hours]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of pulmonary hematologic, psychiatric, neurologic and pain and substance abuse disorders.
Prerequisites: MBC 5310 with a minimum grade of D- and PHCL 5700 with a minimum grade of D- and PHM 5000 with a minimum grade of D-
Corequisites: PHPR 6360

PHPR 5000 Residency and Postgraduate Training Preparation
[1 credit hour]
Instruction on the various aspects of obtaining a position within a pharmacy residency training program or other postgraduate training program.
Term Offered: Spring, Fall

PHPR 5010 Advanced Evidence Based Medicine
[2 credit hours]
This course expands upon the principles and practice of evidence based medicine (EBM) in guiding clinical decision making in pharmacy practice. This course emphasizes advanced concepts in drug literature evaluation and critique of landmark clinical trials.
Term Offered: Fall

PHPR 5020 Pharmaceutics and Dosage Form Design
[5 credit hours]
The lectures and labs in Pharmaceutics and Dosage Form Design have an overarching theme of drug product knowledge. Topics for the lectures and labs include drug product design, pharmaceutical calculations, and an emphasis on contemporary pharmacy compounding.
Term Offered: Fall

PHPR 5050 Interprofessional Approach to Patient Care
[1 credit hour]
This course is designed to prepare all health professions students to deliberately and constructively work together with the common goal of building a safer, better patient-centered and community/population-oriented U.S. health care system. Students will be assigned to small-group interprofessional teams and will interact and collaborate with students from other healthcare professions.
Term Offered: Fall

PHPR 5120 Essentials of U.S. Healthcare Delivery and Pharmacoeconomic Evaluation
[3 credit hours]
This course provides an in-depth understanding of the essential components of healthcare delivery in the United States, with a focus on pharmacoeconomic evaluation.
Term Offered: Spring, Summer, Fall

PHPR 5130 Managed Care Pharmacy
[3 credit hours]
The course will offer in-depth teaching and discussions on managed care pharmacy.
Term Offered: Fall

PHPR 5140 Introduction to Decision Analytic Modeling in Health Outcomes Research
[3 credit hours]
This course introduces students to the fundamental principles and applications of decision analytic modeling in health outcomes and pharmacoeconomic research. Students will learn how decision trees, Markov models, and related analytic frameworks are used to evaluate the clinical and economic impact of healthcare interventions. Emphasis is placed on conceptual understanding, model structure, and interpretation of results rather than software-based computation. The course prepares students to critically assess published models and to design conceptual models that inform healthcare decision-making and policy.
Term Offered: Spring

PHPR 5160 Real-World Data in Health Outcomes Research
[3 credit hours]
This course prepares students to evaluate health outcomes, comparative effectiveness, and health services research using real-world data (RWD) to generate real-world evidence (RWE). Students will gain knowledge of healthcare databases, regulatory frameworks, and methodological challenges associated with RWD. Over 7 weeks, students will explore the fundamentals of RWD and RWE, database types, Comparative Effectiveness Research (CER) study designs, analytical challenges, and global regulatory frameworks. Each week includes 2–3 modules followed by assessments such as quizzes, short assignments, case studies, or group discussions.
Term Offered: Spring

PHPR 5170 Foundations of Patient-Reported Outcomes (PRO) in Healthcare Research
[3 credit hours]
This course provides students with a conceptual understanding of patient-reported outcomes (PROs) and their role in evaluating healthcare interventions. The course focuses on the principles underlying the development, validation, and interpretation of PRO instruments without requiring prior statistical or programming expertise. Students will explore how PROs are used in clinical trials, regulatory submissions, and health outcomes research.
Term Offered: Fall

PHPR 5180 Machine Learning and AI in Health Outcomes
[3 credit hours]
This course introduces students to the application of machine learning (ML) and artificial intelligence (AI) techniques in the context of health outcomes research. Students will gain practical experience with ML algorithms and explore real-world healthcare data to develop predictive models and analyze outcomes.
Term Offered: Spring

PHPR 5190 Master of Science in Health Outcomes and Value Analytics (HOVA) Capstone
[3 credit hours]
This capstone course is the culminating experience for students in the MS in Health Outcomes and Value Analytics (HOVA). Under the direction of a faculty mentor, students will integrate and apply knowledge gained throughout the program to design and complete an independent research project addressing a relevant question in pharmacoeconomics, health technology assessment, or outcomes research.
Term Offered: Spring

PHPR 5250 Introduction to Self Care
[1 credit hour]
The course will provide an introduction to the over-the-counter marketplace and discussion of the pharmacist's patient care process. Special emphasis will be placed on how pharmacists should help patients safely and effectively treat common medical problems.
Prerequisites: PHPR 5450 with a minimum grade of D- or PHCL 5700 with a minimum grade of D-
Term Offered: Spring

PHPR 5260 Pharmacy and Healthcare Administration
[2 credit hours]
Description and analysis of the organization, financing and delivery of healthcare in the U.S.
Term Offered: Spring, Fall

PHPR 5300 DESIGN AND APPLICATIONS OF CANCER CHEMOTHERAPY
[1 credit hour]
In depth discussion of the principles of drug design and development within the framework of the pharmacotherapeutic management of cancer and cancer prevention.
Corequisites: MBC 5300
Term Offered: Fall

PHPR 5310 Introduction to Pharmacy Law
[1 credit hour]
The purpose of this course is to introduce students to laws that regulate the practice of pharmacy. Federal drug laws and specific state laws that regulate the filling and dispensing of prescriptions will be reviewed and applied.
Term Offered: Spring

PHPR 5320 Commonly Prescribed Meds and Med Term 1
[1 credit hour]
This course introduces students to commonly prescribed medications and medical terminology.
Term Offered: Fall

PHPR 5450 Pharmacy Skills Development-1
[2 credit hours]
This course is designed to introduce students to the Pharmacists' Patient Care Process as it is applied to the Community Pharmacy Setting in order to prepare them for their Community Pharmacy Introductory Pharmacy Practice Experiences.
Term Offered: Fall

PHPR 5460 Pharmacy Skills Development-2
[2 credit hours]
Building on competencies from prerequisite courses, this course is designed to enhance skills in the Pharmacists' Patient Care Process (PPCP) as they are applied to the Community Pharmacy Setting.
Prerequisites: PHPR 3450 with a minimum grade of D- or PHPR 5450 with a minimum grade of D-
Term Offered: Spring

PHPR 5520 Pharmaceutical Marketing and Management
[3 credit hours]
Introduction to administrative sciences (marketing/management, etc.) in the provision of pharmaceutical care. Topics include multicultural communication, operation of various pharmacy practice settings, barriers to health care access, facilitation of patient access to pharmaceutical care.
Term Offered: Spring

PHPR 5590 Readings in Access and Cultural Competence
[2 credit hours]
Examination of the literature related to access and cultural competence in the US health care system. Various types of readings will be used to analyze the relationships that exist between access, cultural competence and positive healthcare outcomes.
Prerequisites: PHPR 4520 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Summer

PHPR 5610 Pharmacoeconomics and Outcomes Research I
[2 credit hours]
This course emphasizes advanced concepts, methods, and practical procedures for pharmacoeconomic analysis and outcomes research. The student will learn through readings and experience assessment of patient health status, quality of life, satisfaction and cost-effectiveness for pharmacoeconomic and health outcomes research and interpretation of economic and outcomes data.
Term Offered: Spring

PHPR 5620 Pharmacoeconomics and Outcomes Research II
[3 credit hours]
This course emphasizes advanced concepts, methods and practical procedures for pharmacoeconomic analysis and outcomes research. The student will learn through readings and experience assessment of patient health status, quality of life, cost-effectiveness for pharmacoeconomic and health outcomes research and interpretation of economic and outcomes data.
Prerequisites: PHPR 5610 with a minimum grade of C
Term Offered: Fall

PHPR 5680 Parenteral Manufacturing
[2 credit hours]
The theory and technology of parenteral and ophthalmic formulation design, production, sterilization, packaging and stability.
Prerequisites: (PHPR 3010 with a minimum grade of D- and PHPR 3070 with a minimum grade of D-)
Term Offered: Fall

PHPR 5700 Equilibrium Phenomenon
[2 credit hours]
A theoretical and practical examination of the principles of chemical equilibrium and the techniques used in their calculation. Physical and chemical concepts focus on pharmaceutical systems as well as selected areas of chemistry.
Term Offered: Spring

PHPR 5710 Selected Topics In Pharmaceutical Technology
[2-3 credit hours]
Discussion, evaluation, experimentation and production of selected dosage forms. A forum for the discussion of new dosage form technology and advances.
Prerequisites: (PHPR 3010 with a minimum grade of D- and PHPR 3070 with a minimum grade of D-)
Term Offered: Spring, Summer, Fall

PHPR 5720 Pharmaceutical Rate Processes
[3 credit hours]
A theoretical and practical application of kinetic principles applied to pharmaceutic and cosmetic systems in liquid and solid state. A mathematical treatment and development of the equations which support each reaction mechanism.
Term Offered: Spring, Fall

PHPR 5770 Advanced Drug Delivery Systems – I
[3 credit hours]
The development of drug delivery systems relies on the broad understanding of many different physiological, chemical, and biological factors. This course is designed to introduce advanced drug delivery systems for oral, ocular, transdermal and buccal delivery. The course design is based on the premise that the student desires knowledge about the latest developments in formulation and drug delivery. Students may be required to design a project proposal for presentation.
Term Offered: Spring, Fall

PHPR 5800 Cosmetic Ingredients and Product Forms
[3 credit hours]
In-depth review of cosmetic ingredients, selection and formulation basics, and detailed discussion of product forms in the cosmetic industry.
Term Offered: Spring, Summer, Fall

PHPR 5810 FINANCE AND PERSONAL PLANNING FOR PHARMACISTS
[2 credit hours]
Practical topics on financial, professional, and personal situation to better prepare students to make knowledgeable decisions that affect future security and success. (Prerequisites: Third Professional Year PharmD or permission of instructor.)
Term Offered: Spring, Summer

PHPR 5820 Cosmetic Trends and Claims
[3 credit hours]
A detailed discussion of trends, certifications, and claims within the cosmetic industry for ingredients, finished products, and facilities.
Term Offered: Summer

PHPR 5830 Cosmetic Regulations, Ethics, and Practices
[3 credit hours]
In-depth review of laws and regulations governing the cosmetic industry, focusing on the United States. Legal and ethical considerations associated with ingredient selection and product formulation.
Term Offered: Spring

PHPR 5840 Formulating Skin and Sun Care Products
[3 credit hours]
Detailed discussion of the anatomy and physiology of the skin and its appendages. In-depth review of cosmetics and personal care products applied to the skin for cleansing, protection, and treatment. Main discussion points include product functions, ingredient selection, product design and formulation, and product testing.
Term Offered: Fall

PHPR 5850 Formulating Makeup, Hair Care, and Oral Care Products
[3 credit hours]
Detailed discussion of the anatomy and physiology of hair and the oral cavity. In-depth review of makeup products, hair care products, and oral care products. Main discussion points include product functions, ingredient selection, product design and formulation, and product testing.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Summer, Fall

PHPR 5860 Performance Evaluation Techniques
[3 credit hours]
In-depth review of analytical techniques and methodologies for the assessment of product performance on the hair, skin, and nails.
Term Offered: Fall

PHPR 5870 Compounding Boot Camp
[2 credit hours]
This course is a companion to the Professional Compounding Center of America Boot Camp held at the college every year. Students will complete the boot camp lab experience and work through cases and webinars and other problem solving exercises to master techniques for creating new dosage forms.
Prerequisites: PHPR 3080 with a minimum grade of D-
Term Offered: Summer, Fall

PHPR 5910 Drug-Induced Diseases
[1 credit hour]
An elective course that examines the epidemiology, public impact, contributing factors and causes for various Drug-Induced Diseases. This course will also examine Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacotherapy, to study the etiology, pathophysiology, clinical presentation, diagnosis, and treatment Drug-Induced Diseases.
Term Offered: Spring, Fall

PHPR 5920 Introductory Pharmacy Practice Experience I
[1 credit hour]
First professional year course designed to enhance professional growth through an introduction to clinical skill development and direct patient care activities within institutional and community pharmacy practice settings. Prerequisite: Admission into the Pharm.D. Program.
Term Offered: Spring, Summer, Fall

PHPR 5930 Introductory Pharmacy Practice Experience 2
[1 credit hour]
First professional year course designed to enhance professional growth through an introduction to clinical skill development and direct patient care activities within institutional and community pharmacy practice settings. Prerequisite: Admission into the Pharm.D Program.
Prerequisites: PHPR 3920 with a minimum grade of C or PHPR 5920 with a minimum grade of C
Term Offered: Spring

PHPR 5940 Managed Care Pharmacy Elective
[1 credit hour]
The course will offer in-depth teaching and discussions on managed care pharmacy.
Term Offered: Fall

PHPR 5960 Advocacy in the Pharmacy Profession
[1 credit hour]
The purpose of the course is to teach participants about the role and process of legislative advocacy in the pharmacy profession. Students will learn basic principles of legislative advocacy and contemporary issues in the profession of pharmacy. The course will have a hybrid delivery format with most sessions being delivered in an asynchronous, virtual manner. Students will be required to attend Advocacy Awareness Day in Columbus, date TBD. Travel details will be at the expense of the student (transportation and meals).
Term Offered: Fall

PHPR 5990 Problems In Pharmacy Practice
[1-6 credit hours]
Tutorial or directed, individual research problems in administrative pharmacy, or other related fields.
Term Offered: Spring, Summer, Fall

PHPR 6000 Drug Information Seminar
[2 credit hours]
An advanced seminar course which applies evidence based medicine through literature searching, drug literature evaluation skills, and formal writing and presentation skills to complete a written literature summary and patient population based therapeutic recommendation, as well as a verbal presentations such as case presentations, disease state and pharmacotherapy reviews and other topic discussions.
Term Offered: Spring, Fall

PHPR 6010 Leadership and the Military Healthcare Professional
[2 credit hours]
This two-part online course will cover various advanced leadership discussions and topics, including continuous process improvements, management, followership, difficult conversations/feedback, as well as the development of teams and individuals, and the personal leadership philosophy. Students will be able to apply these skills using real-world applications by performing a continuous process improvement (CPI) project, delivering feedback, and interacting weekly with their classmates in various discussions. Additionally, students will explore the military healthcare system and the role of the healthcare professional in a variety of topics, including readiness, emergency management, deployments, leading/managing personnel, designing programs, and responding to biological/chemical/radioactive/nuclear events (CBRNE). These topics will be discussed in a manner that all students can understand regardless of their professional program or background.
Term Offered: Spring

PHPR 6150 Introduction to Pharmacy Informatics
[2 credit hours]
This course provides students with a comprehensive introduction to pharmacy informatics and its impact on clinical practice. Students will examine how pharmacists use health information technology (HIT) to optimize medication use, enhance patient safety, and support clinical decision-making. Designed with a focus on real-world application, this course emphasizes the pharmacist's role in implementing and optimizing informatics tools.
Term Offered: Spring

PHPR 6200 Patient Centered Care
[2 credit hours]
This course focuses on learning various aspects of Patient Centered Care including: Medication Therapy Management (MTM) services, Motivational Interviewing, Patient Assessment, and Cultural Competence.

PHPR 6220 Pharmacoeconomics and Outcomes Research
[1 credit hour]
This course allows students to gain and expand their knowledge base in areas such as application of pharmacoeconomic and effectiveness measures to the practice of health care.
Term Offered: Fall

PHPR 6250 Advanced Self Care
[3 credit hours]
The course will discuss issues surrounding the self-medication decision-making process. Special emphasis will be placed on how pharmacists should help patients safely and effectively treat common medical problems. The course will provide information about how pharmacists should educate and counsel patients about diagnostic tests that the public can purchase without a prescription.
Term Offered: Spring

PHPR 6260 PHCAD-3
[1 credit hour]
The course will offer in depth teaching and discussions on human resource management, inventory control, and organizational financial management in the respective practice settings.
Prerequisites: PHPR 4520 with a minimum grade of D-
Term Offered: Fall

PHPR 6270 Business Aspects of Pharmacy
[2 credit hours]
This course will provide students with a foundation in the business aspects of the practice of pharmacy and their important role in the provision of pharmaceutical care.

PHPR 6280 PHCAD-4
[2 credit hours]
This course focuses on developing, implementing, and evaluating Medication Therapy Management (MTM) and Disease State Management (DSM) programs.
Prerequisites: PHPR 6260 with a minimum grade of D-
Term Offered: Spring

PHPR 6310 Jurisprudence and Ethics
[1 credit hour]
Discussion of federal, state and local laws affecting the profession and practice of pharmacy. Ethical principles involved in patient care will be reviewed and applied.
Term Offered: Spring

PHPR 6330 Health Systems
[1.5 credit hours]
This course will provide an overview of the organization, financing and delivery of healthcare in the U.S.
Term Offered: Spring

PHPR 6340 RESEARCH DESIGN AND DRUG LITERATURE EVALUATION 2
[2 credit hours]
Concepts of research design, statistical analysis, drug literature evaluation and evidence based medicine are expanded from PHPR 4330 to depict their practical relevance to pharmacy practice.
Prerequisites: PHPR 4330 with a minimum grade of D-
Corequisites: PHPR 6070
Term Offered: Fall

PHPR 6350 Pharmacy Skills Development - 3
[2 credit hours]
Building on competencies from prerequisite courses, this course is designed to enhance skills in the Pharmacists' Patient Care Process (PPCP) as they are applied to the Community and Ambulatory Care Pharmacy settings.
Prerequisites: PHPR 5460 with a minimum grade of D-
Corequisites: PHPR 6200
Term Offered: Fall

PHPR 6360 Pharmacy Skills Development - 4
[2 credit hours]
Building on competencies from prerequisite courses, this course is designed to enhance skills in the Pharmacists' Patient Care Process (PPCP) as they are applied to the Institutional Pharmacy setting.
Prerequisites: PHPR 6350 with a minimum grade of D- and PHPR 6540 with a minimum grade of D-
Term Offered: Spring

PHPR 6390 Commonly Prescribed Meds and Med Term II
[1 credit hour]
This course introduces students to commonly prescribed medications and medical terminology.
Prerequisites: PHPR 5320 with a minimum grade of D-
Corequisites: PHPR 6350
Term Offered: Fall

PHPR 6400 Topics in Internal Medicine
[2 credit hours]
This course is designed to focus on complex and/or controversial pharmacotherapy topics and the evaluation of primary literature and guidelines to promote effective abilities in evaluating, selecting, and recommending pharmacotherapeutic regimens, and educating patients and health care professionals utilizing the principles of evidence based decision making.
Term Offered: Spring, Summer

PHPR 6410 Leadership: Principles and Practice
[2 credit hours]
This course will facilitate student self-discovery first and foremost. Through reflection activities, and discussion students will learn about themselves, the idea of leadership, and how they relate to others. This is not a passive process. Students are expected to actively participate in the course to get the most out of it. The course is meant to help students take a critical look at their relationships with others by answering the following questions; 1) how am I a problem for others? 2) how can I be more helpful to others? 3) how can I help things go right?
Term Offered: Spring, Summer, Fall

PHPR 6460 Pharmacy Skills Development - 5
[2 credit hours]
This advanced course will enhance confidence in application of knowledge and skills to prepare students for competent participation in the Pharmacists Patient Care Process and transitions of care in Advanced Pharmacy Practice Experiences.

PHPR 6470 Pharmacy Skills Development - 6
[2 credit hours]
This course is designed to further develop fundamental skills in the Pharmacists Patient Care Process and to enhance confidence in clinical skills necessary for roles in transitions of care.
Term Offered: Spring

PHPR 6480 Exploring Novel Careers in Pharmacy
[1 credit hour]
This course will introduce students to novel careers in the pharmacy profession. This course will also increase student awareness of careers that can be pursued with a PharmD degree. Students will hear from guest speakers in current novel career positions and have the opportunity to interact with the speakers during a Q&A session.
Term Offered: Spring, Fall

PHPR 6520 Analysis Of The Pharmaceutical Environment
[2 credit hours]
A theoretical and practical examination of the pharmaceutical environment and drug distribution system using administrative pharmacy sciences as a tool for analysis.
Prerequisites: PHPR 4520 with a minimum grade of D-
Term Offered: Spring, Fall

PHPR 6530 Research Methods In Pharmacy Practice
[2 credit hours]
An introduction to research methods and principles used in designing, planning, implementing, analyzing and interpreting research projects in pharmacy practice.
Term Offered: Spring, Fall

PHPR 6540 Evidence Based Medicine 1
[3 credit hours]
This course introduces the principles and practice of evidence based medicine (EBM) in guiding clinical decision making in pharmacy practice.
Term Offered: Fall

PHPR 6560 Evidence Based Medicine 2
[2 credit hours]
This course expands upon the principles and practice of evidence based medicine (EBM) in guiding clinical decision making in pharmacy practice. Students will develop their formal oral presentation skills.
Prerequisites: PHPR 6540 with a minimum grade of D-
Corequisites: PHPR 6360
Term Offered: Spring

PHPR 6600 Seminar In Administrative Pharmacy
[1 credit hour]
A critical analysis of current problems in pharmacy practice with individual case presentations.
Prerequisites: MBC 5310 with a minimum grade of D- and PHCL 5700 with a minimum grade of D- and PHM 5000 with a minimum grade of D-
Corequisites: PHPR 6360
Term Offered: Spring, Fall

PHPR 6700 Special Topics in Diabetes Care
[2 credit hours]
This course focuses on advanced and special population topics in the area of diabetes care and management through discussions, lecture-based teaching and group activities.
Term Offered: Fall

PHPR 6710 Skin Delivery of Cosmetic Actives
[3 credit hours]
Advanced study of skin delivery concepts and methods with a special focus on cosmetic actives.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Spring

PHPR 6720 Global Cosmetic Regulations
[3 credit hours]
Detailed discussion of global cosmetic, personal care, and OTC-drug cosmetic regulations focusing on claim substantiation, manufacturing, packaging, advertising, and testing.
Prerequisites: PHPR 5800 with a minimum grade of C and PHPR 5830 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PHPR 6730 Sustainable Product Development
[3 credit hours]
An overview of the socio-economic demand for sustainable products and how it is shaping the behavior and practices of both consumers and manufacturers alike in cosmetic/personal care product development.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PHPR 6740 Skin Microbiome
[3 credit hours]
An in-depth review of the skin microbiome, product claims and labeling, and the future of skin health.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PHPR 6750 Cosmetic Science Formulation Lab
[3 credit hours]
A laboratory course that focuses on cosmetic and personal care product formulation and testing basics.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Spring, Summer

PHPR 6770 Cosmetic Science Project
[3 credit hours]
An independent research project requiring students to synthesize their knowledge gained in previous coursework and create potential solutions for a real-life concept or problem.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PHPR 6850 Product Development Laboratory
[2 credit hours]
A study of various stages of development of pharmaceutical products. The student will develop formulations, using stability data and production technology for three products.
Prerequisites: PHPR 5690 with a minimum grade of D-
Term Offered: Spring

PHPR 6860 Advanced Drug Delivery Lab
[2 credit hours]
This lab course is designed to provide students hands-on experience and improve their practical knowledge in areas of industrial pharmacy and advanced pharmaceutics. This course would introduce students to the wide range of cutting-edge techniques in the pharmaceutical industry.
Term Offered: Spring, Fall

PHPR 6920 Introductory Pharmacy Practice Experience 5
[1 credit hour]
Third professional year course designed to enhance professional growth through application of skills and knowledge gained in IPPE-3 and IPPE-4 to various areas of pharmacy practice to provide the best possible patient care.
Term Offered: Fall

PHPR 6930 Introductory Pharmacy Practice Experience 3
[1 credit hour]
The purpose of this course is to increase students' awareness and involvement in areas related to the contemporary practice of pharmacy. Students will participate in projects that nurture their professional growth.
Prerequisites: PHPR 3930 with a minimum grade of C or PHPR 5930 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PHPR 6950 Seminar In Industrial Pharmacy
[1 credit hour]
A seminar course composed of graduate student presentations on their research and special topics as well as outside speakers from both the community and pharmaceutical industry.
Term Offered: Spring, Summer, Fall

PHPR 6960 M.S. Thesis Research In Pharmacy
[1-6 credit hours]
Advanced and in-depth study of an issue pertinent to contemporary pharmacy practice. Part of degree requirement for M.S. in Pharmaceutical Sciences.
Term Offered: Spring, Summer, Fall

PHPR 6970 Introductory Pharmacy Practice Experience 4
[1 credit hour]
The purpose of this course is to increase students' awareness and involvement in areas related to the contemporary practice of pharmacy. Students will participate in projects that nurture their professional growth.
Prerequisites: PHPR 4920 with a minimum grade of C or PHPR 6930 with a minimum grade of D-
Term Offered: Spring, Summer

PHPR 6980 Special Topics
[1-5 credit hours]
Selected study of topics in Pharmacy Practice. New pharmacy and healthcare strategies are examined in detail.
Term Offered: Spring, Summer, Fall

PHPR 8940 Clinical Clerkship
[4 credit hours]
The APPE sequence is a fulltime onsite clinical experience designed to allow students to apply knowledge and skills gained in the didactic and IPPE curriculum. The APPE sequence consists of 9 fulltime (40 hour per week) rotations.
Term Offered: Spring, Summer, Fall

PHPR 8980 Special Topics
[1-5 credit hours]
Selected study of topics in Pharmacy Practice. New Pharmacy and healthcare strategies are examined in detail.
Term Offered: Spring, Summer, Fall

Doctor of Pharmacy, DPH

Code	Title	Hours
First Professional (P1) Year--Fall Term		
MBC 5310	Medicinal Chemistry I: Drug Action And Design	2
MBC 5550	Physiological Chemistry I: Structure And Function Of Biological Macromolecules	3
PHCL 5700	Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology	3
PHPR 5020	Pharmaceutics and Dosage Form Design	5
PHPR 5050	Interprofessional Approach to Patient Care	1
PHPR 5320	Commonly Prescribed Meds and Med Term 1	1
PHPR 5450	Pharmacy Skills Development-1	2
PHPR 5920	Introductory Pharmacy Practice Experience I	1
P1 Year--Spring Term		
MBC 5552	Physiological Chemistry II Cellular Metabolism and Homeostasis	2
MBC 5860	Microbiology for Pharmaceutical Professionals	2
PHCL 6160	Biopharmaceutics & Pharmacokinetics	3
PHM 5000	Integrated Pharmaceutical and Clinical Sciences 1	6

PHPR 5250	Introduction to Self Care	1
PHPR 5310	Introduction to Pharmacy Law	1
PHPR 5460	Pharmacy Skills Development-2	2
PHPR 5930	Introductory Pharmacy Practice Experience 2	1
Second Professional (P2) Year--Fall Term		
PHM 6500	Integrated Pharmaceutical and Clinical Sciences 2	8
PHPR 6200	Patient Centered Care	2
PHPR 6350	Pharmacy Skills Development - 3	2
PHPR 6390	Commonly Prescribed Meds and Med Term II	1
PHPR 6540	Evidence Based Medicine 1	3
PHPR 6930	Introductory Pharmacy Practice Experience 3	1
P2 Year--Spring Term		
PHM 6600	Integrated Pharmaceutical and Clinical Sciences 3	8
PHPR 6330	Health Systems	1.5
PHPR 6360	Pharmacy Skills Development - 4	2
PHPR 6560	Evidence Based Medicine 2	2
PHPR 6970	Introductory Pharmacy Practice Experience 4	1
Third Professional (P3) Year--Fall Term		
PHM 6000	Integrated Pharmaceutical and Clinical Sciences 4	7
PHPR 6000	Drug Information Seminar (Fall or Spring)	2
PHPR 6220	Pharmacoeconomics and Outcomes Research	1
PHPR 6460	Pharmacy Skills Development - 5	2
PHPR 6920	Introductory Pharmacy Practice Experience 5	1
Professional Electives		4
P3 Year--Spring Term		
PHM 6200	Integrated Pharmaceutical and Clinical Sciences 5	5
PHPR 6000	Drug Information Seminar (Fall or Spring)	2
PHPR 6250	Advanced Self Care	3
PHPR 6270	Business Aspects of Pharmacy	2
PHPR 6310	Jurisprudence and Ethics	1
PHPR 6470	Pharmacy Skills Development - 6	2
Professional Electives		3
Fourth Professional (P4) Year		
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4

1. Students entering the professional division/program who have completed an undergraduate degree and all program pre-requisite courses, should complete all P1 and P2 courses at the 5000/6000 level as indicated in the plan of study.

DOCTOR OF PHARMACY/PHARMD (FOR P1 STUDENTS with a previous bachelor's degree ENTERING IN FALL 2022 AND AFTER)

Professional

Fifth Term		Hours
MBC 5310	Medicinal Chemistry I: Drug Action And Design	2
MBC 5550	Physiological Chemistry I: Structure And Function Of Biological Macromolecules	3
PHCL 5700	Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology	3
PHPR 5020	Pharmaceutics and Dosage Form Design	5
PHPR 5450	Pharmacy Skills Development-1	2
PHPR 5320	Commonly Prescribed Meds and Med Term 1	1
PHPR 5050	Interprofessional Approach to Patient Care	1
PHPR 5920	Introductory Pharmacy Practice Experience I	1
	Hours	**18**
Sixth Term		
MBC 5552	Physiological Chemistry II Cellular Metabolism and Homeostasis	2
MBC 5860	Microbiology for Pharmaceutical Professionals	2
PHPR 5250	Introduction to Self Care	1
PHPR 5310	Introduction to Pharmacy Law	1
PHPR 5460	Pharmacy Skills Development-2	2
PHCL 6160	Biopharmaceutics & Pharmacokinetics	3
PHPR 5930	Introductory Pharmacy Practice Experience 2	1
PHM 5000	Integrated Pharmaceutical and Clinical Sciences 1	6
	Hours	**18**
Seventh Term		
PHPR 6200	Patient Centered Care	2
PHPR 6350	Pharmacy Skills Development - 3	2
PHPR 6540	Evidence Based Medicine 1	3
PHPR 6390	Commonly Prescribed Meds and Med Term II	1
PHPR 6930	Introductory Pharmacy Practice Experience 3	1
PHM 6500	Integrated Pharmaceutical and Clinical Sciences 2	8
	Hours	**17**
Eighth Term		
PHPR 6330	Health Systems	1.5
PHPR 6360	Pharmacy Skills Development - 4	2

PHPR 6560	Evidence Based Medicine 2	2
PHPR 6970	Introductory Pharmacy Practice Experience 4	1
PHM 6600	Integrated Pharmaceutical and Clinical Sciences 3	8
	Hours	**14.5**
Ninth Term		
Institutional IPPEs		
	Hours	**0**
Tenth Term		
PHPR 6000	Drug Information Seminar (Fall or Spring) [2]	2
PHPR 6220	Pharmacoeconomics and Outcomes Research	1
PHPR 6460	Pharmacy Skills Development - 5	2
PHPR 6920	Introductory Pharmacy Practice Experience 5	1
PHM 6000	Integrated Pharmaceutical and Clinical Sciences 4	7
Professional Elective [1]		4
	Hours	**17**
Eleventh Term		
PHPR 6000	Drug Information Seminar (Fall or Spring)	-
PHPR 6250	Advanced Self Care	3
PHPR 6270	Business Aspects of Pharmacy	2
PHPR 6310	Jurisprudence and Ethics	1
PHPR 6470	Pharmacy Skills Development - 6	2
PHM 6200	Integrated Pharmaceutical and Clinical Sciences 5	5
Professional Elective [1]		3
	Hours	**16**
Twelfth Term		
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
	Hours	**20**
Thirteenth Term		
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship	4
	Hours	**16**
	Total Hours	**136.5**

[1] A total of 7 credit hours of Graduate Professional Electives is required.
[2] This course may be taken in Fall or Spring, making the program a total of 69 hours.

In order to graduate with a Pharm.D. degree, students must meet the current academic performance standards. Only students who successfully complete the Pharm.D. degree will qualify for licensure in the practice of pharmacy. A total of 136.5 semester hours is required for graduation with the Pharm.D. degree. The Pharm. D. program is accredited by ACPE and will be revisited for reaccreditation in Fall of 2019.

Pharm.D. Graduate Professional Electives

The following is a list of recommended graduate professional electives. A total of 7 credit hours of graduate professional electives is required. Other electives may be chosen with the written approval of the CPPS Curriculum Committee. A graduate course which significantly overlaps in content with a course used to fulfill the undergraduate professional elective requirement will not count towards fulfilling the graduate professional elective requirement. Credit for courses taken outside The University of Toledo can be counted towards professional elective credit requirements if a grade of C or better is earned, but grades will not be factored into CPPS or University of Toledo GPA calculations.

Code	Title	Hours
MBC		
MBC 5100/7100	Ethical Conduct Research	1
MBC 5380	Medicinal And Poisonous Plants	3
MBC 5620/7620	Biochemical Techniques	2
MBC 6100/8100	Advanced Immunology	2
MBC 6190/8190	Advanced Medicinal Chemistry	4
MBC 6200/8200	Biomedicinal Chemistry	4
MBC 6400	Cannabis Science: Plants and Products	3
MBC 6980	Special Topics In Biomedicinal Chemistry	1-5
PHCL		
PHCL 5730	Principles and Systems Toxicology	3
PHCL 5750	Environmental, Food, and Analytical Toxicology	3
PHCL 5990	Problems In Pharmacology	1-6
PHCL 6400	Cannabis Science – Risks & Benefits	3
PHCL 6600	Seminar In Pharmacology	1
PHPR		
PHPR 5000	Residency and Postgraduate Training Preparation	1
PHPR 5010	Advanced Evidence Based Medicine	2
PHPR 5590	Readings in Access and Cultural Competence	2
PHPR 5710	Selected Topics In Pharmaceutical Technology	2-3
PHPR 5810	FINANCE AND PERSONAL PLANNING FOR PHARMACISTS	2
PHPR 5910	Drug-Induced Diseases	1
PHPR 5940	Managed Care Pharmacy Elective	1
PHPR 5960	Advocacy in the Pharmacy Profession	1
PHPR 5990	Problems In Pharmacy Practice	1-6
PHPR 6010	Leadership and the Military Healthcare Professional	2
PHPR 6400	Topics in Internal Medicine	2
PHPR 6410	Leadership: Principles and Practice	2
PHPR 6480	Exploring Novel Careers in Pharmacy	1
PHPR 6530	Research Methods In Pharmacy Practice	2

PHPR 6600	Seminar In Administrative Pharmacy	1
PHPR 6700	Special Topics in Diabetes Care	2
PHPR 6950	Seminar In Industrial Pharmacy	1
PHPR 6980	Special Topics	1-5
PHM		
PHM 6400	Physical and Mental Effects of Psychoactive Substances	2
Additional Recommendations		
BUAD 6100	Accounting For Decision Making	3
BUAD 6200	Corporate Finance	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6400	Results-Based Management	3
BUAD 6500	International Business	3
BUAD 6600	Supply Chain Management	3
BUAD 6800	Information Technology And E-Business	3
BUAD 6900	Strategic Management Capstone	3
CHEM 6510	Protein Chemistry	4
COUN 6240	Diagnosis And Mental Health	4
COUN 8460	Substance Abuse Counseling	4
PUBH 6080	Social Determinants of Health	3
PUBH 6330	Public Health and Aging	3

- PLO 1.1 Learner - Seek, analyze, integrate, and apply foundational knowledge of medications and pharmacy practice (biomedical; pharmaceutical; social, behavioral, administrative; and clinical sciences; drug classes; and digital health).
- PLO 2.1 Problem-solver - Use problem solving and critical thinking skills, along with an innovative mindset, to address challenges and to promote positive change.
- PLO 2.2 Communicator - Actively engage, listen, and communicate verbally, nonverbally, and in writing when interacting with or educating an individual, group, or organization.
- PLO 2.3 Ally - Mitigate health disparities by considering, recognizing, and navigating cultural and structural factors (e.g., social determinants of health, diversity, equity, inclusion, and accessibility) to improve access and health outcomes.
- PLO 2.4 Provider - Provide whole person care to individuals as the medication specialist using the Pharmacists' Patient Care Process.
- PLO 2.5 Advocate - Promote the best interests of patients and/or the pharmacy profession within healthcare settings and at the community, state, or national level.
- PLO 2.6 Steward - Optimize patient healthcare outcomes using human, financial, technological, and physical resources to improve the safety, efficacy, and environmental impact of medication use systems.
- PLO 2.7 Collaborator - Actively engage and contribute as a healthcare team member by demonstrating core interprofessional competencies.
- PLO 2.8 Promoter - Assess factors that influence the health and wellness of a population and develop strategies to address those factors.
- PLO 2.9 Leader - Demonstrate the ability to influence and support the achievement of shared goals on a team, regardless of one's role.
- PLO 3.1 Self-aware - Examine, reflect on, and address personal and professional attributes (e.g., knowledge, metacognition, skills, abilities, beliefs, biases, motivation, help-seeking strategies, and emotional intelligence that could enhance or limit growth, development, professional identity.
- PLO 3.2 Professional - Exhibit attitudes and behaviors that embody a commitment to building and maintaining trust with patients, colleagues, other health care professionals, and society.

MSPS in Industrial Pharmacy

The Master of Science in pharmaceutical sciences degree is designed to prepare an individual for responsibilities in professional practice, the pharmaceutical industry and scientific research beyond those possible with a baccalaureate.

Although a single degree is conferred, specialization is possible in that the curriculum is organized into three distinct disciplines, referred to here as "options". Applicants must select the program of study (option) they wish to pursue. The options available to graduate students are:

- pharmacology/toxicology,
- health outcomes and and value analytics, and
- industrial pharmacy.

The requirements for the Master of Science in pharmaceutical sciences degree differ according to the option. The minimum course work for the industrial pharmacy major is 24 semester hours, for the pharmacology/toxicology major 28 semester hours and for the health outcomes and and value analytics, major 27 semester hours. In addition, each major requires a minimum of 6 semester hours of thesis research.

In general, a baccalaureate in the sciences is required for admission, although applicants possessing other bachelor's degrees will be considered if the latter represent adequate preparation. Certain options and graduate courses require undergraduate preparation as prerequisites, and this preparation should be completed as soon as possible upon admission. The total time required for completion of the graduate program leading to the Master of Science in pharmaceutical sciences degree will depend upon the preparation of the student entering the program. Normally two years of study and research are required.

The admission requirements of the College of Graduate Studies of the University apply. The basic requirement is a 2.7 (on a 4.0 scale) GPA on all undergraduate work leading to the bachelor's degree. Applicants having less than a 2.7 GPA on all undergraduate work will be considered for admission if other criteria for estimation of potential success in graduate studies are positive.

Each student must submit three copies of transcripts, one of which must be official and show all post-secondary academic work and degrees granted, three letters of recommendation from college faculty members acquainted with the applicant's character and ability. The Graduate Record Exam (GRE) is not required for admission, but is highly recommended for International students.

International students are required to take an English language test (https://www.utoledo.edu/graduate/prospectivestudents/admission/

guidelines.html), which will be given in their own country by the Educational Testing Service.

Normally, acceptance will be decided by April 1 for admission during the following fall semester. The priority deadline for completed applications is January 15th. Complete applications received by this deadline will be considered for admission. Applications received after the January 15th deadline may also be considered, if positions are available in a program. International students are encouraged to submit applications one month prior to the stated deadline to allow for delays in international correspondence.

A minimum of 24 credit hours of course work and a minimum of 6 credit hours of thesis work for a total of 30 required minimum credit hours for the degree.

Code	Title	Hours
Graduate Required Courses [1]		
PHCL 5760	Toxicokinetics	3
PHPR 5770	Advanced Drug Delivery Systems – I	3
PHPR 6950	Seminar In Industrial Pharmacy	1
PHPR 6960	M.S. Thesis Research In Pharmacy	1-6
PUBH 6000	Quantitative and Qualitative Data Analysis in Public Health	3
PHPR 6860	Advanced Drug Delivery Lab	2
PHPR 6960	M.S. Thesis Research In Pharmacy	1-6
MBC 5100	Ethical Conduct Research	1
CHEM 6300	Advanced Analytical Chemistry	4
PHPR 5720	Pharmaceutical Rate Processes	3
Electives (optional) [2]		
MBC 5620	Biochemical Techniques	2
PHPR 5710	Selected Topics In Pharmaceutical Technology	2-3
PHPR 5990	Problems In Pharmacy Practice	1-6
PHPR 6530	Research Methods In Pharmacy Practice	2
PHPR 5700	Equilibrium Phenomenon	2
PHPR 5780		2
CHEM 6310	Separation Methods	3
CHEM 6810	Materials Science I	4

1 Seminar course must be taken 2 times therefore 2 credit hours total to meet requirements. 6 thesis credit hours are the required minimum; more than 6 credit hours can be taken.

2 Two credit hours of electives must be satisfied by taking courses within the PHPR Department.

Successful oral defense of the thesis before the thesis advisory committee (consisting of the thesis adviser and two other members) and presentation of the results of the thesis research in a seminar before the Division of Industrial Pharmacy.

Acceptance of thesis by the M.S. thesis advisor and the thesis advisory committee.

Applicants for the health outcomes and socioeconomic sciences and industrial pharmacy options who possess a B.S. in pharmacy, Pharm.D. or bachelor of science in pharmaceutical sciences degree from an ACPE-accredited institution will be given preference for admission into those options. International applicants must have earned pharmacy degrees from their home institutions.

- PLO 1. Interpret and critically evaluate literature in the respective discipline and identify gaps in current knowledge.
- PLO 2. Design, implement, and analyze the results of an independent research project in the respective discipline.
- PLO 3. Effectively communicate and defend research findings orally and in writing.
- PLO 4. Describe and comply with standards of ethical conduct of research.
- PLO 5. Effectively work in a team of colleagues within the discipline.

Clinical Outcomes and Research Foundations Graduate Certificate

Code	Title	Hours
PHPR 6220	Pharmacoeconomics and Outcomes Research	1
PHM 5100	Research in Pharmaceutical Science: Ethics & Methods	3
PHM 5110	Clinical Trials and Regulatory Affairs	3
PHCL 6710	Fundamentals of Biostatistics and Research Analysis	3
Total Hours		**10**

- Describe and comply with standards of ethical conduct of research. (MS HOVA PLO 1)
- Develop a novel research project while applying pharmaceutical science knowledge and skills to solve problems. (MS HOVA PLO 2)
- Interpret and critically evaluate literature in pharmaceutical science disciplines while identifying gaps in current knowledge. (MS HOVA PLO 4)
- Apply pharmaceutical science principles while designing, implementing, and analyzing the results of an independent research project in a discipline. (MS HOVA PLO 5)

Cosmetic Claims Substantiation Graduate Certificate

Code	Title	Hours
PHPR 5800	Cosmetic Ingredients and Product Forms	3
PHPR 5820	Cosmetic Trends and Claims	3
PHPR 5830	Cosmetic Regulations, Ethics, and Practices	3
PHPR 5860	Performance Evaluation Techniques	3
Total Hours		12

- Evaluate ingredient selection, consumer perception, and marketing trends that shape evidence based cosmetic claims.
- Interpret U.S. regulatory requirements to develop compliant products, documentation, labeling, and claims.
- Design performance testing strategies using experimental methods, instrumentation, and consumer testing to support claims

Cosmetic Regulatory Affairs Graduate Certificate

Code	Title	Hours
PHPR 5800	Cosmetic Ingredients and Product Forms	3
PHPR 5820	Cosmetic Trends and Claims	3
PHPR 5830	Cosmetic Regulations, Ethics, and Practices	3
PHPR 6720	Global Cosmetic Regulations	3
Total Hours		**12**

- 1. Demonstrate knowledge of ingredient function, physicochemical and biological properties, and proper ingredient selection to support product claims.
- 2. Interpret current and relevant regulations and guidelines, ethical standards, and peer-reviewed scientific literature to assess the quality, efficacy, and safety of cosmetics and personal care products.
- 3. Design cosmetic and personal care products that are regulatory compliant globally and meet consumers' needs.

Pharmacy Informatics Graduate Certificate

Code	Title	Hours
PHPR 6150	Introduction to Pharmacy Informatics	2
PHPR 6920	Introductory Pharmacy Practice Experience 5	1
PHPR 8940	Clinical Clerkship	4
Elective		3
Total Hours		**10**

- PLO 1.1 Learner - Seek, analyze, integrate, and apply foundational knowledge of medications and pharmacy practice (biomedical; pharmaceutical; social, behavioral, administrative; and clinical sciences; drug classes; and digital health).
- PLO 2.1 Problem-solver - Use problem solving and critical thinking skills, along with an innovative mindset, to address challenges and to promote positive change.
- PLO 2.6 Steward - Optimize patient healthcare outcomes using human, financial, technological, and physical resources to improve the safety, efficacy, and environmental impact of medication use systems.

John B. and Lillian E. Neff College of Business and Innovation

Graduate Catalog 2026-2027

The John B. and Lillian E. Neff College of Business and Innovation was established in 1930 and is currently the second-largest professional college on the campus of The University of Toledo. It is also one of only 5 percent of business colleges around the world to receive accreditation from The Association to Advance Collegiate Schools of Business (AACSB International). The college is also one of roughly 2 percent of institutions to hold an additional, specialized AACSB Accreditation for its accounting program. Our mission is to integrate business education, meaningful research, and diverse partnerships to foster tomorrow's leaders, transform businesses, and support the regional and global community.

Our very qualified faculty and staff are here to provide the very best well-rounded college experience for our students, both in and out of the classroom. The faculty bring relevance to the classroom and continuously advance the state-of-the-art knowledge about various topics/issues by translating their cutting-edge research contributions into classroom applications. The business industry demands skilled professionals ready to accept the challenges of an evolving world. With the highest graduation rates at The University of Toledo, we're committed to giving you the tools and networking opportunities to thrive. Let John B. and Lillian E. Neff College of Business and Innovation be your partner in achieving your educational and career goals.

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Graduate Degrees/Certificates Offered

The John B. and Lillian E. Neff College of Business and Innovation is accredited by the Association to Advance Collegiate Schools of Business (AACSB International) for undergraduate and graduate work. The graduate division of the college affords students an excellent opportunity to earn a degree on a full-time or part-time basis. The Neff College of Business and Innovation offers the following degree programs at the graduate level:

- Master of Business Administration (M.B.A.) (https://catalog.utoledo.edu/graduate/business-innovation/departments-schools/college-programs/mba/)
- Master of Business Administration in Executive Management (E.M.B.A.) (p. 297)
- A dual Juris Doctor/Master of Business Administration (J.D./ M.B.A.) (p. 293)
- A dual Doctor of Medicine/Master of Business Administration (M.D./ M.B.A) (p. 295)
- A dual Master of Public Health/Master of Business Administration (M.P.H/M.B.A) (p. 294)
- A dual Pharmacy/Master of Business Administration (Pharm.D./ M.B.A.) (p. 294)
- A dual Bachelor of Science in Engineering/Master of Business Administration (B.S./M.B.A) (p. 293)
- Master of Science in Accountancy (M.S.A) (p. 275)
- Master of Applied Business Analytics (M.A.B.A.) - STEMM

Specializations within the Master of Business Administration Program

- Administration (p. 296) - Available 100% online
- Finance (p. 281) - Available 100% online - STEM
- Public Health Management (p. 298) - Available 100% online
- Human Resource Management (p. 289) - Available 100% online
- Information Systems (p. 283) - STEM
- Leadership (p. 289) - Available 100% online
- Marketing: Sales & Sales Management, International Marketing, or Marketing Management (p. 291)- available 100% online
- Operations and Supply Chain Management (p. 283) - STEM

Specialization Within The Master Of Science in Accountancy

- General Track (https://catalog.utoledo.edu/graduate/business-innovation/departments-schools/department-accounting/msa-accounting/#requirementstext)

Graduate Certificates

- Business Foundations (https://catalog.utoledo.edu/graduate/business-innovation/graduate-degrees-certificates-offered/graduate-certificate-business-foundations/) - available 100% online
- Leadership (p. 290) - available 100% online
- Marketing (p. 292) - available 100% online
- Corporate Finance (p. 279) - available 100% online
- Investments (p. 280) - available 100% online
- Financial Accounting (p. 277) - available 100% online
- Operations and Supply Chain Management (p. 287)
- Business Analytics (p. 286) - Available 100% online
- Information Systems ERP/SAP (p. 286)
- Cannabis Management (https://catalog.utoledo.edu/graduate/business-innovation/graduate-degrees-certificates-offered/graduate-certificate-cannabis-management/) - available 100% online

Students enrolled in a Neff College of Business and Innovation graduate certificate program may use up to 9 credit hours of coursework toward

a Neff College of Business and Innovation ***graduate degree***. Students enrolled in a Neff College of Business and Innovation graduate degree program may use up to 9 credit hours of coursework toward a Neff College of Business and Innovation ***graduate certificate***.

GPA and Grade Requirements

Students in all graduate degree and certificate programs at the University of Toledo must complete all requirements for their program of study with at least a 3.0 (4.0 scale) cumulative GPA at the graduate level. All courses that count towards a graduate degree or certificate must be passed with a grade of C or better. There are no grade re-calculations at the graduate level; as such, repeated courses will have both grades included in the cumulative GPA calculation.

College Policies (Graduate Handbook)

- A (p. 407)cademic Policies and Advising Services (p. 269)
- A (p. 270)dmissions Policies (p. 270)
- Degree Requirements (p. 274)
- College of Graduate Studies (p. 407)

Academic Policies and Advising Services

General Requirements

Refer to the general College of Graduate Studies (p. 407) section of this catalog for general academic policies that apply to all graduate students in areas such as advising, minimum enrollment, dishonesty, grievance, and probation and dismissal.

Academic Advising

Advising for the M.A.B.A, M.S.A, M.B.A., and Neff College of Business and Innovation graduate certificate programs are available in the Office of Graduate Programs located in Stranahan Hall Suite 1016. Students are encouraged to meet with an Academic Advisor regularly. Academic Advisors are here to assist with student concerns related to academics, policies and procedures, academic planning, and graduation. Academic Advisors, at times, may also provide referrals for services. While Academic Advisors are here to assist with students as needed, each student is ultimately responsible for correct and timely completion of degree requirements.

The College of Graduate Studies utilizes the pdf plan of study form to define the student's course of study, and focus for degree. It is the student's responsibility to notify their Academic Advisor of any changes to an approved plan of study and to track progress toward degree.

The Degree Audit Reporting System (DARS) is an automated record that contains all the student's graduation requirements and assist with tracking student's progress toward meeting those requirements. Degree audits are used to confirm degree program requirements for graduation. Degree audits are available to students online through the myUT portal Student Self-Service. Students are encouraged to keep their plan of study and to discuss their degree audits (DARS) with their Academic Advisors. Utilizing both tools will ensure consistency with meeting all degree requirements and making progress toward degree.

Students interested in changing their major or program are encouraged to meet with their Academic Advisor to discuss how the change will impact program requirements, timely completion, and career aspirations.

Financial Assistance

Over the years, a myriad of generous donors have directed their philanthropic efforts toward the John B. and Lillian E. Neff College of Business and Innovation. Many of the donations have been designated exclusively for scholarships for business students. As a result, the Neff College of Business and Innovation proudly awards approximately $200,000 in scholarships each spring semester to currently enrolled students for the coming academic year.

Criteria for the business scholarships vary greatly. For example, some scholarships are based on the student's major area of study while others are based on GPA, financial need, and/or rank. By completing one on-line application, students are automatically considered for all scholarships for which they meet the criteria. Annually, the online scholarship is available between November 8th through February 1st from a link that is available on the Neff College of Business and Innovation scholarships webpage during that timeframe. Scholarship applications are due each year on February 1st. While this application is targeted towards undergraduate students, there are many scholarships that are available to graduate students.

Students are also welcome to complete a scholarship search through the Office of Student Financial Aid designating the Neff College of Business and Innovation and Graduate level in the search criteria.

Transfer Students

Students who have taken graduate course work at another AACSB-accredited university or from another college at The University of Toledo may, upon recommendation of the appropriate Department Chair and Associate Dean for Graduate Research, be permitted to transfer up to twelve semester hours, not to exceed one-third of the hours required for the graduate degree, of business-related course work toward master level degrees. A grade of B or higher must be achieved in order to transfer any graduate courses, and the transferred credit must not have been applied in whole or in part toward any other degree or certificate from another university. Students must hold regular admission status and be actively pursuing a graduate degree before requesting transfer credit. Transfer credits must have been earned within the period of six years immediately preceding the time the degree is awarded. If the previously approved transfer credit is beyond the time limitation for the degree, it can no longer be used to fulfill degree requirements.

Student Academic Conduct and Academic Grievance

Issues related to charges of student academic misconduct or disputes as to final course grades and or program dismissal, and the procedures for resolving such issues are set forth by the specific language of the Neff College of Business and Innovation Code of Student Academic Conduct and the procedures for resolution of such issues in the Neff College of Business and Innovation Student Academic Grievance Procedure. Procedural guidelines are located on the college's web site.

Neff College of Business and Innovation Code of Student Academic Conduct: http://www.utoledo.edu/business/COBI/COBIDocs/CodeOfAcademicConduct.pdf

Neff College of Business and Innovation Student Academic Grievance Procedure: http://www.utoledo.edu/business/COBI/COBIDocs/GrievanceProcedure.pdf

Student Grievance Form: http://www.utoledo.edu/business/COBI/COBIDocs/StudentGrievanceForm.pdf

UT-Graduate Academic policies (http://www.utoledo.edu/policies/academic/graduate/)

Academic Probation and Dismissal

Graduate students whose cumulative GPA falls below 3.0 during any semester will be automatically placed on academic probation. Full-time students on academic program will have at most two semesters to meet the cumulative GPA standard. A student failing to meet the standard will be subject to dismissal. A part-time student on academic probation will be required to meet the GPA standard after 12 additional credit hours of graduate coursework. Students are required to meet with their Advisor to develop a plan of action to improve their GPA.

A grade of C (2.0) is the minimum passing grade for graduate courses. Grades of below C will continue to be counted in calculating the cumulative grade point average. Students are not permitted to exceed two courses, for a maximum of 12 credit hours, of course retakes. Both the original and the repeated grades will appear on the transcript and will be calculated into the cumulative GPA. Grade deletion is not an option at the graduate level.

Students who are subjected to Academic Dismissal must sit out for a minimum of two calendar years prior to seeking program readmission. A student may exercise the graduate academic fresh start option by submission of a petition to the Vice Provost for Graduate Affairs and Dean of the Graduate College once the student is readmitted and successfully completes 12 credit hours (not to exceed three semesters) with a grade of B (3.0) or higher in each courses. Academic Fresh start will remove the graduate cumulative grade point average for all grades earned under the student's prior enrollment at the University of Toledo. All University of Toledo grades will remain on the student's official, permanent academic record.

Readmission

The readmission process is required for graduate students who have not registered for one calendar year or more and wish to complete the program to which they were previously admitted or those who wish to return from an approved leave of absence. Students need to work with their Advisor to prepare the materials required to complete the readmission application. All required readmission materials must be completed and approved through the Neff College of Business and Innovation before the application will be reviewed by the Graduate College. Admissibility and catalog eligibility will be determined during this process. Upon review and approval, the matriculation will be reopened and notification sent to both the student and Advisor by the Graduate College. A fee of $50 is assessed for the re-admission process. Once approved, an email will be sent to the student's UToledo email account to initiate payment with a link to our secure Touchnet payment site to complete the process.

Students who have exceeded the original time limit for degree (6 years) at the time of completing the readmission process will have to seek either: Continuation of Matriculation for Degree (one year extension) or Request for Time Extension & Course Recertification (beyond one year). Students will work with their Academic Advisor to complete the additional request.

Graduation

When students are nearing the completion of their program, they must file an application to graduate online through myUT portal by the posted deadline dates. The College of Graduate Studies will verify that all requirements have been satisfied before notification will be sent to the Registrar's Office of degree completion. Students are encouraged to work closely with their Academic Advisor to ensure all degree requirements have been met. Students are also encouraged to review the Master or Doctoral Student's Degree Completion Requirements on the College of Graduate Studies website.

University commencement is held twice per year: Spring and Fall. Summer graduates are invited to participate in either the Fall or Spring commencement however, Summer graduates will be included in the Fall commencement program.

Admissions Policies

Admission to Master of Business Administration (M.B.A.) Program

Admission to the M.B.A. program is available to those students who can demonstrate high promise of success in a graduate business degree program. The college has adopted qualitative admissions standards in which applicants are considered on the basis of their merits, with weight given to prior *academic achievement*, undergraduate *GPA*, and professional work *experience*. Candidates can use the following guidelines to determine eligibility for admission:

Automatic admissions is highly likely for candidates that have

- *a graduate* (or higher) degree* ***or***
- *an undergraduate degree with at least a 3.0 GPA* **or***
- *between a 2.7 and 2.99 undergraduate GPA* ***with*** *at least 3 years of professional work experience*

For candidates who do not meet any one of the forementioned criteria, applications will be reviewed on the merits of a recommendation letter, purpose statement, and optional GMAT score.

The following documents are **required** for admission to the program:

- Completed online application
- Official transcripts from each post-secondary institution attended.
- Resume

The following material is **optional** and will be used to evaluate candidates who do not meet any one of the forementioned criteria:

- One letter of recommendation from an individual who knows you in a professional capacity.

- The statement of purpose which is a one-page essay stating why you believe you belong in the M.B.A. program and what the M.B.A. program can do you for you professionally.
- Official GMAT scores sent directly from the Graduate Management Admissions Council (GMAC) to the College of Graduate Studies. GMAT scores must be no more than five years old. In lieu of the GMAT, other graduate level test scores can be considered (e.g., GRE, LSAT, MCAT, PCAT)

Students interested in the pipeline program must submit the following:

- BBA/Master of Business and Administration Letter of Intent (https://www.utoledo.edu/business/COBI/COBIDocs/MBA_MSA%20Pipeline%20Letter%20of%20Intent%20-%20Final%2010%2012%2021.pdf). This letter requires authorization from your undergraduate advisor that you are eligible to enroll in graduate courses and that you will continue to make progress toward your undergraduate degree,
- a completed MBA graduate admission application,
- at least 2 letter(s) of recommendation from faculty members.
- After successful completion of the application process, students will be considered for admission to the graduate program.

In the case of students whose native language is not English, a score of 80 or above on the TOEFL IBT, PTE equal to 58 or above, Duolingo equal to 110 or above, or a 6.5 or above on the International English Language Testing System (IELTS) is mandatory.

*Graduate or Undergraduate degrees must be earned from a nationally or regionally accredited institution. GPA calculated on a 4.0 scale.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall semester	August 1
Spring semester	November 15
Summer semester	April 15

International students:

Fall semester	May 1
Spring semester	October 1
Summer semester	March 1

Final admissions decisions will be withheld until the application for admission is complete. No materials submitted to the University will be returned to the applicant.

Admission to Executive Master of Business Administration (E.M.B.A.) Program

The E.M.B.A. program is designed for executives and professionals with a minimum of three to five years of management or professional experience. The E.M.B.A. Admissions Committee seeks candidates with proven leadership potential. The following documents are required for admission to the program:

1. Official transcripts from each post-secondary institution attended.
2. A current resume to allow the Admissions Committee the opportunity to assess the individual's work experience.

All applicants to the E.M.B.A. program are also required to interview with the Admissions Committee. The interview will take place once the application for admission has been completed. Applications for admission are considered on a rolling basis for fall entry only. Final admissions decisions will be withheld until the application for admission is complete. No materials submitted to the University will be returned to the applicant.

Admission to Joint J.D./M.B.A. Program

Students applying for the J.D./M.B.A. program must have earned a bachelor's degree. A student must apply and be admitted to the College of Law and College of Business and Innovation separately to be admitted to the J.D/M.B.A. dual degree program.

Admission to one program does not guarantee admission to the other program. Refer to the College of Law (p. 155) and M.B.A. sections of this catalog for specific admission standards for each program. Applications for admission to the J.D. program are accepted for fall entry only.

Admission to Joint M.D./M.B.A. Program

Students applying for the M.D./M.B.A. program must have earned a bachelor's degree. A student must apply and be admitted to the College of Medicine and Life Sciences and the College of Business and Innovation separately to be admitted to the M.D./M.B.A dual degree program.

Admission to one program does not guarantee admission to the other program. Refer to the College of Medicine (p. 156) and M.B.A. sections of this catalog for specific admission standards for each program. Applications for admission to the M.D. program are accepted for fall entry only.

Admission to Joint MPH/M.B.A. Program

Students applying for the Master of Public Health/M.B.A. dual degree program must have earned a bachelor's degree. A student must apply and be admitted to the College of Health and Human Services and the College of Business and Innovation separately to be admitted to the MPH/M.B.A dual degree program.

Admission to one program does not guarantee admission to the other program. Refer to the College of Health and Human Services (https://catalog.utoledo.edu/graduate/health-human-services/graduate-degrees-certificates-offered/) and M.B.A. sections of this catalog for specific admission standards for each program.

Admission to Joint PharmD./M.B.A. Program

Students applying for the PharmD./M.B.A. program must have earned a bachelor's degree. A student must apply and be admitted to the College of Pharmacy and Pharmaceutical Sciences and the College of Business and Innovation separately to be admitted to the PharmD./M.B.A dual degree program.

Admission to one program does not guarantee admission to the other program. Refer to the College of Pharmacy and Pharmaceutical Science

(p. 242) and M.B.A. sections of this catalog for specific admission standards for each program.

Admission to Joint B.S./M.B.A. Degree Program

The College of Business and Innovation in conjunction with the College of Engineering offers a program whereby qualified students can earn simultaneously both a B.S. in engineering and an M.B.A. This program provides a unique opportunity to combine business and engineering skills to prepare graduates for global competitiveness. It supports the mission of the College of Business and Innovation to prepare corporate leaders for the future. The program should be particularly attractive to students interested in starting their own companies or those who want to develop an appreciation for how engineering and business complement each other.

This program will allow engineering students in their final two semesters of study to begin taking M.B.A. courses while completing their B.S. This arrangement should reduce the time it takes a student to receive both degrees by a year. The business undergraduate prerequisites can be satisfied as part of the undergraduate curriculum.

Students who wish to pursue the program should make this known to the senior associate dean for undergraduate studies in the College of Engineering by the end of their sophomore year. Interested students should apply for admission to the program to the College of Graduate Studies before the fall of their senior year. To be admitted to the program, students must have senior standing, and have at least a 3.0 cumulative GPA. Undergraduate equivalents to the MBA Common Body of Knowledge must also be completed. Upon admission to the program by the College of Graduate Studies, the College of Business and Innovation and the College of Engineering, students will be take graduate courses while simultaneously completing the requirements for the B.S. in engineering.

Students' special status must be tracked by the Office of Student Retention and Academic Success to assure AACSB compliance and to assure the B.S. degree is granted prior to graduating with the M.B.A.

admission to the Neff COBI pipeline programs

Undergraduate students accepted in the BBA-MBA or BBA-MSA, or BBA-MABA option will be admitted to the graduate program and allowed to complete up to three **graduate *level* classes** (nine credit hours) during their final academic year of ***undergraduate studies***. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be able to apply ***to the completion of both undergraduate and graduate degree requirements***. Students would want to work with their undergraduate advisor to determine if they have room in their undergraduate degree to have these graduate courses meet undergraduate graduation requirements. Students can register for graduate classes taken at The University of Toledo only after the student is accepted into the pipeline program. Students interested in the joint pipeline program must submit 1) a letter of interest, 2) a completed graduate admission application, and 3) at least 2 letter(s) of recommendation from faculty members (BBA-MBA and BBA-MABA only).

- Undergraduate students of any business major can apply to the MBA and MABA programs, but only accounting majors are permitted to apply to the MSA program.
- Students must have approval from their undergraduate advisor, graduate advisor, and a minimum GPA of 3.0 (including transfer grades) to apply.
- Students may apply to take up to three (nine credit hours) 6000-level graduate classes in their senior year and only pay undergraduate tuition.
- Students should apply in their junior year so that they can be admitted in time to add graduate courses to their schedule for Fall registration.
- Students will not be permitted to delay their BBA graduation to participate in the pipeline programs.
- Students are not required to take all three classes; students may take just one or two courses.

MBA Class options: BUAD 6100, BUAD 6300, BUAD 6400, BUAD 6500, BUAD 6800.

MSA Class options: BUAD 6200, BUAD 6300, BUAD 6400, BUAD 6500, BUAD 6800, ACCT 6130, ACCT 6190, ACCT 6250, ACCT 6600.

MABA Class options: up to two of the following: INFS 6150, OSCM 6250, OSCM 6350; one of the following based on functional area: BUAD 6100, BUAD 6200, BUAD 6300, BUAD 6600, BUAD 6800.

Admission to Master of Science in Accountancy (M.S.A.) Program

Admission to the M.S.A. program is available to those students who can demonstrate high promise of success in a graduate degree program. The department of accounting has adopted qualitative admissions standards in which applicants are considered on the basis of their merits, with weight given to prior academic achievement, undergraduate GPA, and professional work experience.

The following material is **required** of all candidates for admission to the program:

- Completed online application.
- Official transcripts from each post-secondary institution attended.
- Resume including contact information for two references (name, title, place of employment, phone number and e-mail address).

Automatic admissions is highly likely for candidates that have

- *a graduate* (or higher) degree* ***or***
- *an undergraduate degree with at least a 3.0 GPA** ***or***
- *between a 2.7 and 2.99 undergraduate GPA* ***with*** *at least 3 years of professional work experience*

For candidates who do not meet any one of the forementioned criteria, the following materials are recommended:

- Two letters of recommendation from an individual who knows you in a professional capacity.

- The statement of purpose which is a one-page essay stating why you believe you belong in the M.S.A. program and what the M.S.A. program can do you for you professionally.
- Official GMAT scores (optional) sent directly from the Graduate Management Admissions Council (GMAC) to the College of Graduate Studies. GMAT scores must be no more than five years old. In lieu of the GMAT, other graduate level test scores can be considered (e.g., GRE, LSAT, MCAT, PCAT)

*Graduate or Undergraduate degrees must be earned from a university whose business school is accredited by AACSB. GPA calculated on a 4.0 scale.

In the case of students whose native language is not English, a score of 80 or above on the TOEFL IBT, PTE equal to 58 or above, Duolingo equal to 110 or above, or a 6.5 or above on the International English Language Testing System (IELTS) is mandatory.

Students interested in the pipeline joint BBA/MSA program must submit the following:

- BBA/Master of Science in Accountancy Letter of Intent (https://www.utoledo.edu/business/COBI/COBIDocs/MBA_MSA%20Pipeline%20Letter%20of%20Intent%20-%20Final%2010%2012%2021.pdf). This letter requires authorization from your undergraduate advisor that your eligible to enroll in graduate courses and that you will continue to make progress toward your undergraduate degree,
- a completed graduate admission application.

After successful completion of the application process, students will be considered for admission to the graduate program.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall semester	August 1
Spring semester	November 15
Summer semester	April 15

International students:

Fall semester	May 1
Spring semester	October 1
Summer semester	March 1

Final admissions decisions will be withheld until the application for admission is complete. No materials submitted to the University will be returned to the applicant. The M.S.A. program admits students to the program on a rolling admissions basis.

admission to master of applied business analytics

The admission decision will be based on a composite profile of the applicant including test scores, academic background, grades, work experience, letters of reference, and also the statement of purpose. The typical admitted student in the M.A.B.A. program has at least a 2.7 undergraduate GPA and 4800 on the GMAT or equivalent score in the GRE. Additional requirements include proficiency in spreadsheets and a programming language, a calculus course with C or better both of which may be met by taking courses if necessary after a provisional admission. The following documents are required for admission to the program:

1. Official transcripts from each post-secondary institution attended.

2. Official GMAT scores sent directly from the Graduate Management Admissions Council (GMAC) or GRE score sent directly by educational testing service to the College of Graduate Studies. The minimum GMAT score is 480 (equivalent score in the GRE), must be no more than five years old.

3. The GMAT may be waived for applicants who have earned:

    a. An undergraduate degree or MBA from UToledo (minimum 3.0 GPA) within the last ten years or

    b. A Master in Economics, Statistics, Mathematics or Engineering (minimum 3.00 GPA) within the last ten years,

4. Most recent resume or curriculum vitae including contact information for two references (name, title, place of employment, phone number and e-mail address).

5. A 400 word essay on statement of purpose.

Students interested in the pipeline program must submit the following:

- BBA/Master of Applied Business Analytics Letter of Intent (https://www.utoledo.edu/business/COBI/COBIDocs/MBA_MSA%20Pipeline%20Letter%20of%20Intent%20-%20Final%2010%2012%2021.pdf). This letter requires authorization from your undergraduate advisor that you are eligible to enroll in graduate courses and that you will continue to make progress toward your undergraduate degree,
- a completed MABA graduate admission application,
- at least 2 letter(s) of recommendation from faculty members.
- After successful completion of the application process, students will be considered for admission to the graduate program.

In the case of students whose native language is not English, a score of 80 or above on the TOEFL IBT, PTE equal to 58 or above, Duolingo equal to 110 or above, or a 6.5 or above on the International English Language Testing System (IELTS) is mandatory.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall semester	August 1
Spring semester	November 15
Summer semester	April 15

International students:

Fall semester	May 1
Spring semester	October 1
Summer semester	March 1

Final admissions decisions will be withheld until the application for admission is complete. No materials submitted to the University will be returned to the applicant. The M.A.B.A. admits students to the program on a rolling admissions basis.

Degree Requirements

GPA and Grade Requirements

Students in all graduate degree programs at the University of Toledo must complete all requirements for their program of study with at least a 3.0 (4.0 scale) cumulative GPA at the graduate level. All courses that count towards a graduate degree must be passed with a grade of C or better. There are no grade re-calculations at the graduate level; as such, repeated courses will have both grades included in the cumulative GPA calculation.

Master of Business Administration (M.B.A.) - Available 100% online

The M.B.A. degree is granted to students who satisfactorily complete a minimum of 33 semester hours at the 6000-level in the Neff College of Business and Innovation. The length of the program will vary depending upon the nature of the undergraduate degree. The program consists of a common body of knowledge (9 hours), business core (24 hours) and elective (9 hours) courses determined by the student's major.

If a student can demonstrate that they have completed equivalent course work at the undergraduate level prior to admission to the M.B.A. program and has earned a grade of C (2.0) or better in the course(s), the corresponding 5000-level course may be waived. Once admitted to the M.B.A. program, students may not take an undergraduate course and apply that course towards credit for 5000-level requirements.

Students who complete three or more undergraduate level courses in a functional area at an AACSB-accredited business school are eligible and encouraged to replace the corresponding 6000-level business core course(s) with an M.B.A. 6000 level elective of their choice. These course substitutions may not meet major elective requirements. Students may select up to two majors and no more than one course will be allowed to count towards two majors in the M.B.A. program.

Master of Science in Accountancy (M.S.A.)

The Master of Science in Accountancy degree is granted to students who satisfactorily complete a minimum of 30 semester hours at the 6000-level in the Neff College of Business and Innovation. The M.S.A. program is designed to prepare students for a professional career in accounting and to fulfill the requirements to sit for the Uniform CPA Exam in the state of Ohio. Candidates without a background in accounting can be admitted to the program but will be required to take additional courses.

master of applied business analytics - Available 100% online

The Master of Applied Business Analytics (M.A.B.A.) degree is granted to students who satisfactorily complete a minimum of 30 semester hours at the 6000-level in the Neff College of Business and Innovation meeting the program requirements. In addition, most non-business students and even some business students may need up to 12 credit hours of 5000-level pre-requisites.

Departments

- Department of Accounting (p. 274)
- Department of Information Systems and Supply Chain Management (p. 281)
- Department of Management (p. 288)
- Department of Marketing (p. 290)
- John B. and Lillian E. Neff Department of Finance (p. 278)
- Dual Degrees and Joint Plan of Study (p. 293)
- Professional Programs (p. 296)

Department of Accounting

Academic Advising is provided by Rachel Schaeffer, M.B.A.
Rachel.Schaeffer@utoledo.edu

mission

The John B. and Lillian E. Neff College of Business and Innovation provides innovative and relevant learning experiences and engages in high-quality research and teaching to prepare students to become life-long, ethical business and academic leaders who are prepared for global challenges.

The objective of the Master of Science in Accountancy (MSA) degree program is to provide an opportunity for students to achieve greater breadth and depth in the study of Accountancy than is possible in the baccalaureate program. The MSA program gives student the advanced accounting topics, data analytics, and business electives to be a successful accountant and business leader. Skills such as critical and analytical thinking, leadership, teamwork, effective communication, and the ability to deal with big data and data analytics are important skills for short- and long-term career success in a dynamic environment.

Accreditations

The Accounting Department and the John B. and Lillian E. Neff College of Business and Innovation are accredited by the AACSB and the HLC.

Degrees Offered

The Master of Science in Accountancy degree is granted to students who satisfactorily complete a minimum of 30 semester hours at the 6000-level in the College of Business and Innovation. Candidates without a background in accounting can be admitted to the program but will be required to take additional courses.

The MSA program is designed to fulfill the requirements for CPA licensure in the state of Ohio and many other states. Nationally, candidates who

qualify to sit for the CPA exam with an MSA degree have the highest pass rates.

The MSA program gives students the advanced skills to be a successful accountant and business leader. Skills such as critical and analytical thinking, leadership, teamwork, effective communication, and the ability to deal with big data and data analytics are important skills for short and long-term career success in a dynamic environment.

Master of Science in Accountancy (MSA) (p. 275)

Graduate Certificate in Financial Accounting (p. 277) - available 100% online

Code	Title	Hours
ACCT 5000	Financial And Managerial Accounting	3
ACCT 5100	Data Analytics in Accounting	3
ACCT 5110	Intermediate Financial 1	3
ACCT 5120	External Financial Reporting II	3
ACCT 5310	Accounting Information Systems and Controls	3
ACCT 5320	Cost Accounting	3
ACCT 5420	Auditing	3
ACCT 5940	Internship	1-3
ACCT 6130	Advanced Financial Accounting	3
ACCT 6190	Contemporary Accounting Problems	3
ACCT 6250	Corporate Taxation	3
ACCT 6310	Managerial Accounting and Decision Making	3
ACCT 6330	AIS Process, Technology, and Analytics	3
ACCT 6410	Governmental And Not-For-profit Accounting	3
ACCT 6430	Business Valuation And Analysis	3
ACCT 6440	Advanced Auditing	3
ACCT 6450	Fraud and Forensic Accounting	3
ACCT 6510	Auditing Concepts and Applications	3
ACCT 6520	Regulation Capstone Taxation and Business Law Studies	3
ACCT 6530	Comprehensive Financial Accounting and Reporting	3
ACCT 6540	An Accounting Perspective of the Business Environment	3
ACCT 6960	Independent Study In Accounting	1-3
ACCT 6600	Data Analytics for Accountants	3

MSA Accounting

The objective of the Master of Science in Accountancy (MSA) degree program is to provide an opportunity for students to achieve greater breadth and depth in the study of Accountancy than is possible in the baccalaureate program. The MSA program gives student the advanced skills to be a successful accountant and business leader. Skills such as critical and analytical thinking, leadership, teamwork, effective communication, and the ability to deal with big data and data analytics are important skills for short and long-term career success in a dynamic environment. The MSA program is also designed to fulfill the requirements to sit for the Uniform CPA Exam in the state of Ohio and other states. Nationwide, the CPA candidates who qualify to sit for the CPA exam with an MSA degree have the highest pass rates.

Admission to the M.S.A. program is available to those students who can demonstrate high promise of success in a graduate degree program. The department of accounting has adopted qualitative admissions standards in which applicants are considered on the basis of their merits, with weight given to prior academic achievement, undergraduate GPA, and professional work experience.

The following material is required of all candidates for admission to the program:

- Completed online application.
- Official transcripts from each post-secondary institution attended.
- Resume including contact information for two references (name, title, place of employment, phone number and e-mail address).

Automatic admissions is highly likely for candidates that have

- *a graduate* (or higher) degree* ***or***
- *an undergraduate degree with at least a 3.0 GPA** ***or***
- *between a 2.7 and 2.99 undergraduate GPA* ***with*** *at least 3 years of professional work experience*

For candidates who do not meet any one of the forementioned criteria, the following materials are recommended:

- Two letters of recommendation from an individual who knows you in a professional capacity.
- The statement of purpose which is a one-page essay stating why you believe you belong in the M.S.A. program and what the M.S.A. program can do you for you professionally.
- Official GMAT scores (optional) sent directly from the Graduate Management Admissions Council (GMAC) to the College of Graduate Studies. GMAT scores must be no more than five years old. In lieu of the GMAT, other graduate level test scores can be considered (e.g., GRE, LSAT, MCAT, PCAT)

University of Toledo students interested in the BBA/MSA pipeline program must also submit the
following:

- BBA/Master of Science in Accountancy Letter of Intent (https://www.utoledo.edu/business/COBI/COBIDocs/MBA_MSA%20Pipeline%20Letter%20of%20Intent%20-%20Final%2010%2012%2021.pdf). This letter requires authorization from your undergraduate advisor that your eligible to enroll in graduate courses and that you will continue to make progress toward your undergraduate degree, and
- a completed MSA graduate admission application.

After successful completion of the application process, students will be considered for admission to the graduate program.

In the case of students whose native language is not English, a score of 80 or above on the TOEFL IBT, PTE equal to 58 or above, Duolingo equal to 110 or above, or a 6.5 or above on the International English Language Testing System (IELTS) is mandatory.

*Graduate or Undergraduate degrees must be earned from a university whose business school is accredited by AACSB. GPA calculated on a 4.0 scale.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall Semester	August 1
Spring Semester	November 15
Summer Semester	April 15

International students:

Fall Semester	May 1
Spring Semester	October 1
Summer Semester	March 1

Final admissions decisions will be withheld until the application for admission is complete. No materials submitted to the University will be returned to the applicant. The M.S.A. program admits students to the program on a rolling admissions basis.

The Master of Science in Accountancy degree is granted to students who satisfactorily complete a minimum of 30 semester hours at the 6000-level in the College of Business and Innovation.

Code	Title	Hours
Accounting Core Courses (12 hours) - Take the following 4 courses:		12
ACCT 6130	Advanced Financial Accounting [1]	3
ACCT 6190	Contemporary Accounting Problems	3
ACCT 6250	Corporate Taxation	3
ACCT 6600	Data Analytics for Accountants	3
Accounting Electives (12 hours) - Choose 4 courses from the following: [2]		12
ACCT 6260	Taxation of Pass-Through Entities	
ACCT 6270	Tax and Business Strategy	
ACCT 6310	Managerial Accounting and Decision Making	
ACCT 6330	AIS Process, Technology, and Analytics	
ACCT 6410	Governmental And Not-For-profit Accounting	
ACCT 6430	Business Valuation And Analysis	
ACCT 6440	Advanced Auditing	
ACCT 6450	Fraud and Forensic Accounting	
ACCT 6520	Regulation Capstone Taxation and Business Law Studies	
ACCT 6530	Comprehensive Financial Accounting and Reporting	
ACCT 6540	An Accounting Perspective of the Business Environment	
ACCT 6510	Auditing Concepts and Applications	
ACCT 6960	Independent Study In Accounting	
Business Electives (6 hours) - Choose 2 courses from the following		6
Two graduate business courses.		
BUAD 6200	Corporate Finance	
BUAD 6300	Strategic Marketing And Analysis	
BUAD 6400	Results-Based Management	
BUAD 6500	International Business	
BUAD 6600	Supply Chain Management	
BUAD 6800	Information Technology And E-Business	
OSCM 6250	Essentials of Business Analytics	
Total Hours		**42**

1 ACCT 4130 at the undergraduate level

2 MSA 4 Core courses (12 hours) above required for all MSA students. MSA Elective courses: 18 hours (6 courses) - at least 12 credit hours (4 courses) of Accounting Electives.

Other UT graduate courses are allowed as electives with pre-approval from the MSA academic advisor. If a student takes one of the courses above at the undergraduate level (specifically ACCT 4130, ACCT 4250 and ACCT 4410), these courses may not be taken at the graduate level. This does not reduce the number of credit hours or courses required to earn the MSA degree. The student will select a different option with the Accounting Department Chair and MSA Program Advisor. Other courses from the College of Business and Innovation (or, in the case of a JD/MSA student, a course from the College of Law) may also be approved for the three areas above, with good cause shown, by the Accounting Department Chair and/or MSA Program Advisor.

MSA Common Body of Knowledge

Based on the candidate's prior course work, any or all of the MSA Common Body of Knowledge may be waived (each course is three semester hours):

If a student can demonstrate that he/she has completed equivalent course work at the undergraduate level prior to admission to the M.**S**.A. program and has earned a grade of C (2.0) or better in the course(s), the corresponding **course below** may be waived. The undergraduate and graduate equivalents are below.

Code	Title	Hours
ACCT 3100/5100	Data Analytics in Accounting	3
ACCT 3110/5110	Intermediate Financial 1	3
ACCT 3120/5120	Intermediate Financial 2	3
ACCT 3210/5210	Individual Taxation	3
ACCT 3310/5310	Accounting Information Systems And Controls	3
ACCT 3320/5320	Cost Accounting	3
ACCT 4420/5420	Auditing	3
Total Hours		**21**

Students must have an average GPA of 3.0 or higher in the common body of knowledge courses in order to proceed into 6000 level accounting classes.

Early admission/bridge program - BBA - MSA

Undergraduate students accepted in the BBA-MSA option will be admitted to the Master of Science in Accountancy program and allowed to complete up to three **graduate *level* classes** (nine credit hours) during

their final academic year of ***undergraduate studies***. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in the MSA program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied ***to completion of both undergraduate and MSA degree requirements***. The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the pipeline program, 2) only BUAD 6200, BUAD 6300, BUAD 6400, BUAD 6500, BUAD 6800, ACCT 6130, ACCT 6190, ACCT 6250, OSCM 6250 may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students must have at the time of application 1) a minimum of 3.0 cumulative undergraduate grade point average that will include undergraduate credits earned at other institutions and transferred to UT, 2) undergraduate advisor's approval, and 3) graduate advisor's approval.

- PLO 1: Propose a well-formulated solution, including its contingencies and future implications to a professional or enterprise.
- PLO 2: Apply advanced concepts to prepare the general purpose financial statements.
- PLO 3: Evaluate business risks, related to data collection, storage and use.
- PLO 4: Demonstrate ability to collect, clean, analyze and interpret data for decision-making.
- PLO 5: Identify ethical implications of accounting decisions on firm and capital markets.
- PLO 6: Locate areas of risk within an enterprise and suggest appropriate responses.
- PLO 7: Identify and evaluate current accounting issues.

Graduate Certificate in Financial Accounting - available 100% online

A Graduate Certificate in Business is a program of study designed to help students understand a specific area of business and applications within the field. Ideal for both graduate students who seek to explore a specific area of concentration in business as well as working professionals seeking business education credentials to potentially advance in a current career or to build a foundation for a new career. Admissions to a graduate certificate does not guarantee admissions to a Neff College of Business and Innovation master's program. In order for courses to count toward a Neff College of Business and Innovation certificate or master's degree, a grade of "C" or better is required.

ADD A GRADUATE CERTIFICATE

If you are currently enrolled in a degree seeking program and wish to earn a certificate while pursuing this degree, please email Rachel Schaeffer (rachel.schaeffer@utoledo.edu).

If you are not currently enrolled in a degree seeking program but wish to earn a certificate, please complete the Graduate Online application. Start application for Graduate Certificate in Financial Accounting (https://www.utoledo.edu/graduate/apply/).

Applicants Will Submit the Following:

- Transcripts showing evidence of a Bachelor's degree with at least a 2.7 cumulative G.P.A.
- Resume
- Application and Fee (if required)

for International Students:

- International Students currently pursuing a graduate degree (masters, Ph.D., MD, JD) at The University of Toledo are eligible to apply for graduate certificates in business.
- International students not currently enrolled in a graduate degree-seeking program with The University of Toledo are not eligible to apply for a graduate certificate program.

No GMAT or GRE will be required for admission to a Neff COBI graduate certificate, however if the student later applies to a graduate program at The University of Toledo, a GMAT/GRE score may be required. Refer to admission requirements for the program of interest.

Notes: Admissions to a Neff COBI graduate certificate program does not guarantee admissions to a Neff COBI master's program. For courses to count toward a Neff COBI certificate or master's degree, a grade of "C" or better is required.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall semester	August 1st
Spring semester	November 15th

International students:

Fall semester	May 1st
Spring semester	October 1st

Take the following three courses:

Code	Title	Hours
ACCT 5100	Data Analytics in Accounting	3
ACCT 5110	Intermediate Financial 1	3
ACCT 5120	Intermediate Financial 2	3

Prerequisite for ACCT 5100 is ACCT 5000 for Level GR with minimum grade of C or equivalent UG/GR course from accredited University or equivalent experience (department chair signoff required). The prerequisite to ACCT 5110 is ACCT 5100 for level GR with a minimum grade of C or equivalent UG/GR course from accredited university. The prerequisite to ACCT 5120 is ACCT 5110 for level GR with a minimum grade of C or equivalent UG/GR course from accredited university.

- PLO 1: Acquired accounting concepts, terminology, and principles related to financial statements.
- PLO 2: Will be able to describe the effect of transaction on the financial statement.
- PLO 3: Will be able to analyze financial statements.
- PLO 4: Apply data analytics concepts to financial accounting issues.

John B. and Lillian E. Neff Department of Finance

Kainan Wang, Chair
Kainan.Wang@utoledo.edu (kainan.wang@utoledo.edu)

Academic Advising provided by Rachel Schaeffer
Rachel.Schaeffer@Utoledo.edu (rachel.schaeffer@utoledo.edu)

Mission

The John B. and Lillian E. Neff College of Business and Innovation provides innovative and relevant learning experiences and engages in high-quality research and teaching to prepare students to become life-long, ethical business and academic leaders who are prepared for global challenges.

The John B. and Lillian E. Neff Department of Finance accomplishes this by:

- Preparing our students to create innovative solutions to relevant business problems
- Helping our students to understand and make ethical choices
- Connecting our students with organizations to help begin and advance their careers
- Engaging in a faculty-driven process to identify and support publishing in high-impact research outlets
- Mentoring faculty, collaboration with colleagues inside and outside of COBI, and providing a formal peer feedback process to improve teaching and research
- Engaging and involving the regional and international business community in opportunities for student experiential learning, career exploration and development, consulting, and research projects
- Engaging business and alumni advisory boards and focus groups to develop and improve curricula and programs

The Master of Business Administration (M.B.A.) program with the major in Finance at the University of Toledo (UToledo) is designed to take students with the B.B.A. degree to the next level in order to meet the increasing requirements of the business environment. The program provides background and prepares students to careers in investment, banking, and corporate finance. The program is designed to be flexible, sharpen your skills, and boost your career to the next level.

Accreditations

The Master of Business Administration (M.B.A.) is accredited by the Association to Advance Collegiate Schools of Business (AASCB).

Degrees Offered

The minimum number of credit hours required to graduate with an M.B.A. in Finance is 33 credit hours. The M.B.A. in Finance includes 11 courses: Eight courses are from the M.B.A. business core and three courses in finance electives. Students without the Common Body of Knowledge courses from undergraduate preparation will be required to take up to three additional courses at the graduate level.

MBA Finance (p. 281) - Available 100% online -STEM

Graduate Certificate in Corporate Finance (p. 279) - Available 100% online

Graduate Certificate in Investments - Available 100% online

Code	Title	Hours
FINA 5310	Managerial Finance and Economics (Prerequisite to FINA 6000-level electives) (Common Body of Knowledge) Prerequisite ACCT 5000	3
BUAD 6200	Corporate Finance	3
FINA 6130	Advanced Corporate Finance	3
FINA 6140	Investments And Security Analysis	3
FINA 6150	Financial Institutions And Markets	3
FINA 6340	Derivative Securities	3
FINA 6370	MBA International Financial Management	3
FINA 6890	Financial Modeling	3
FINA 6480	Student Managed Portfolio	3
FINA 6750	Research In Finance (Instructor approval)	1-3

FINA 5310 Managerial Finance and Economics
[3 credit hours]
This course combines key elements of economics and financial management for students with limited prior experience in these areas. The economics segment covers both microeconomics, focusing on individual and firm-level decision-making, and macroeconomics, addressing broader economic policies and issues like unemployment and inflation. In the financial management portion, students will learn essential skills for financial analysis, investment decisions, understanding the time value of money, and exploring stock and bond valuation. The course emphasizes the interplay between economic principles and financial strategies, preparing students for effective decision-making in business contexts.
Prerequisites: ACCT 5000 (may be taken concurrently) with a minimum grade of C or BUAD 2040 (may be taken concurrently) with a minimum grade of C and BUAD 2050 (may be taken concurrently) with a minimum grade of C or ACTG 1040 (may be taken concurrently) with a minimum grade of C and ACTG 1050 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6130 Advanced Corporate Finance
[3 credit hours]
The course emphasizes the application of financial decision making tools, techniques and theory. Specific topics include advanced capital budgeting, cost of capital, enterprise valuation, mergers and acquisitions, real options and corporate governance.
Prerequisites: BUAD 6200 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6140 Investments And Security Analysis
[3 credit hours]
This course covers portfolio analysis and asset pricing models such as CAPM, APT, and index models. It also examines bond and stock valuation. In addition, it discusses investment characteristics of individual securities and markets in which these securities are traded, as well as performance evaluation of portfolios.
Prerequisites: FINA 5310 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6150 Financial Institutions And Markets
[3 credit hours]
This course covers operations of financial institutions and financial markets. Topics include interest rate theory, the monetary policy of the Federal Reserve, financial instruments characteristics, banking management, and internationalization.
Prerequisites: FINA 5310 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6340 Derivative Securities
[3 credit hours]
It examines the valuation of and institutional characteristics of derivative securities such as options, futures, forward contracts, and swaps among others. The course covers the Black-Scholes and binomial option-pricing models. It also introduces the risk management aspect of derivative securities.
Prerequisites: FINA 5310 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6370 MBA International Financial Management
[3 credit hours]
Techniques and theory of financial management in an international environment. The role of international markets in risk reduction and profit maximization are emphasized.
Prerequisites: FINA 5310 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6480 Student Managed Portfolio
[3 credit hours]
Course provides selected students active portfolio management training utilizing an endowed portfolio. Student Portfolio Managers apply equity selection analysis and portfolio risk analytics, with fiduciary responsibilites.
Prerequisites: FINA 5310 with a minimum grade of C or FINA 3480 with a minimum grade of C
Term Offered: Spring, Fall

FINA 6750 Research In Finance
[1-3 credit hours]
This course fullfils the need for students who would like to do research on specific area of finance supervised by a faculty member.
Prerequisites: BUAD 6200 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6890 Financial Modeling
[3 credit hours]
This course is a technical introduction to Excel with a particular emphasis on building financial models and learning practical Excel. We will cover time value of money, capital budgeting, and firm valuation. We will build detailed pro forma financial statements for estimating firm value and capital constraints. We will manipulate and analyze datasets using PowerPivot and PowerBI, and learn how to import data from non-excel data sources. We will briefly cover the Visual Basic language in order to program custom macros. Finally, students will build a personal financial workbook that includes a monthly and annual budget and retirement plan.
Prerequisites: FINA 5310 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Summer, Fall

Graduate Certificate in Corporate Finance - Available 100% online

A Graduate Certificate in Business is a program of study designed to help students understand a specific area of business and applications within the field. Ideal for both graduate students who seek to explore a specific area of concentration in business as well as working professionals seeking business education credentials to potentially advance in a current career or to build a foundation for a new career. Admissions to a graduate certificate does not guarantee admissions to a Neff College of Business and Innovation master's program. In order for courses to count toward a Neff College of Business and Innovation certificate or master's degree, a grade of "C" or better is required.

ADD A GRADUATE CERTIFICATE

If you are currently enrolled in a degree seeking program and wish to earn a certificate while pursuing this degree, please email Rachel Schaeffer (rachel.schaeffer@utoledo.edu).

If you are not currently enrolled in a degree seeking program but wish to earn a certificate, please complete the Graduate Online application. Start Graduate Certificate in Corporate Finance application. (https://www.utoledo.edu/graduate/apply/)

Applicants Will Submit the Following:

- Transcripts showing evidence of a Bachelor's degree with at least a 2.7 cumulative G.P.A.
- Resume
- Application and Fee (if required)

for International Students:

- International Students currently pursuing a graduate degree (masters, Ph.D., MD, JD) at The University of Toledo are eligible to apply for graduate certificates in business.
- International students not currently enrolled in a graduate degree-seeking program with The University of Toledo are not eligible to apply for a graduate certificate program.

No GMAT or GRE will be required for admission to a Neff COBI graduate certificate, however, if the student later applies to a graduate program at

The University of Toledo, a GMAT/GRE score may be required. Refer to admission requirements for the program of interest.

Notes: Admissions to a Neff COBI graduate certificate program does not guarantee admissions to a Neff COBI master's program. For courses to count toward a Neff COBI certificate or master's degree, a grade of "C" or better is required.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall semester	August 1st
Spring semester	November 15th

International students:

Fall semester	May 1st
Spring semester	October 1st

Take both of the following:

Code	Title	Hours
BUAD 6200	Corporate Finance	3
FINA 6130	Advanced Corporate Finance	3

AND Choose one of the following:

Code	Title	Hours
FINA 6150	Financial Institutions And Markets	3
FINA 6370	MBA International Financial Management	3

Prerequisite for BUAD 6200 is FINA 5310 for Level GR with minimum grade of C or [BUAD 3040 (Principles of Finance) for Level UG with minimum grade of C. The prerequisite to FINA 5310 is ACCT 5000 for level GR with a minimum grade of C or BUAD 2040 and BUAD 2050 for Level UG with minimum grade of C] or [ACTG 1040 for Level UG with minimum grade of C and ACTG 1050 for Level UG with minimum grade of C] or equivalent UG/GR course from accredited University. FINA 5310 with a grade of C or higher is a prerequisite to all Finance 6000-level electives. BUAD 6200 with a grade of C or higher is a prerequisite to FINA 6130.

- PLO 1. Present a cohesive approach to financial decision making based on the principle of shareholder maximization
- PLO 2. Examine the concepts and methodology of long and short-term investment and financing decisions, and their effect on the firm
- PLO 3. Evaluate business projects based on the cost of capital and make decisions using capital budgeting concepts
- PLO 4. Integrate real and current business examples to illustrate a variety of financial practices and theory

Graduate Certificate in Investments - Available 100% online

A Graduate Certificate in Business is a program of study designed to help students understand a specific area of business and applications within the field. Ideal for both graduate students who seek to explore a specific area of concentration in business as well as working professionals seeking business education credentials to potentially advance in a current career or to build a foundation for a new career. Admissions to a graduate certificate does not guarantee admissions to a Neff College of Business and Innovation master's program. In order for courses to count toward a Neff College of Business and Innovation certificate or master's degree, a grade of "C" or better is required.

ADD A GRADUATE CERTIFICATE

If you are currently enrolled in a degree seeking program and wish to earn a certificate while pursuing this degree, please email Rachel Schaeffer (rachel.schaeffer@utoledo.edu).

If you are not currently enrolled in a degree seeking program but wish to earn a certificate, please complete the Graduate Online application. Start application for Graduate Certificate in Investments. (https://www.utoledo.edu/graduate/apply/)

Applicants Will Submit the Following:

- Transcripts showing evidence of a Bachelor's degree with at least a 2.7 cumulative G.P.A.
- Resume
- Application and Fee (if required)

for International Students:

- International Students currently pursuing a graduate degree (masters, Ph.D., MD, JD) at The University of Toledo are eligible to apply for graduate certificates in business.
- International students not currently enrolled in a graduate degree-seeking program with The University of Toledo are not eligible to apply for a graduate certificate program.

No GMAT or GRE will be required for admission to a Neff COBI graduate certificate, however if the student later applies to a graduate program at The University of Toledo, a GMAT/GRE score may be required. Refer to admission requirements for the program of interest.

Notes: Admissions to a Neff COBI graduate certificate program does not guarantee admissions to a Neff COBI master's program. For courses to count toward a Neff COBI certificate or master's degree, a grade of "C" or better is required.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall semester	August 1st
Spring semester	November 15th

International students:

Fall semester	May 1st
Spring semester	October 1st

Take the following:

Code	Title	Hours
BUAD 6200	Corporate Finance	3
AND Choose two of the following:		6

FINA 6140	Investments And Security Analysis
FINA 6150	Financial Institutions And Markets
FINA 6340	Derivative Securities
FINA 6480	Student Managed Portfolio (may count towards two of the three needed courses)
FINA 6890	Financial Modeling and AI Applications
Total Hours	**9**

Prerequisite for BUAD 6200 is FINA 5310 for Level GR with minimum grade of C or [BUAD 3040 (Principles of Finance) for Level UG with minimum grade of C. The prerequisite to FINA 5310 is ACCT 5000 with a minimum grade of C or BUAD 2040 and BUAD 2050 for Level UG with minimum grade of C] or [ACTG 1040 for Level UG with minimum grade of C and ACTG 1050 for Level UG with minimum grade of C] or equivalent UG/GR course from accredited University. The FINA 5310 with a grade of C or higher is a prerequisite to all Finance 6000 level electives. BUAD 6200 with a grade of C or higher is a prerequisite to FINA 6130.

- PLO 1. Explore the principles of risk and return, risk-averse decision making, and the valuation of assets.
- PLO 2. Evaluate equity securities through fundamental, industry, and financial statement analysis.
- PLO 3. Analyze and explain the risk and valuation of fixed-income securities.
- PLO 4. Manage the interest rate and credit risks faced by financial institutions.
- PLO 5. Learn how derivative securities can be used for hedging and risk management.

MBA Finance - available 100% online - STEM

Overview of Program

As a finance M.B.A. student at the University of Toledo, you will embark on a high-quality educational experience that is based on a strong theoretical foundation and relevant practice cases. You may create your own path to graduation and, more importantly, find opportunities, mentors, and guidance to enrich your learning experience. This is a STEM program.

Specifically, you will learn how to:

- Understand, plan, and make decisions about a wide range of financial management issues. In particular, students will learn how to make corporate decisions about investment, financing, and payouts. Make advanced capital budgeting decisions, manage the cost of capital, provide enterprise valuation, evaluate mergers and acquisitions deals, and estimate the value of real options.
- Examine bond and stock valuations and make investment decisions. Students will also learn investment characteristics of individual securities and markets as well as performance evaluation of portfolios. The curriculum features the student-managed portfolio (SMP) class. The students will get an opportunity to participate in the active portfolio management training in the state of art Lillian E. and John B. Neff trading facility. In this class, students will apply the equity valuation concepts and portfolio risk analysis to manage the endowed fund, which is currently valued at over 4 million dollars.
- Make financial decisions in the context of financial markets and institutions. Students will learn interest rate theory, the monetary policy of the Federal Reserve, financial instruments characteristics, and banking management.

Finance

The Finance major provides students with a background in all major areas of finance including corporate finance, investments and portfolio management, and financial institutions and markets. Students majoring in Finance must choose three of the following courses.

Code	Title	Hours
MAB Core Requirements		
BUAD 6100	Accounting For Decision Making	3
BUAD 6200	Corporate Finance	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6400	Results-Based Management	3
BUAD 6500	International Business	3
BUAD 6600	Supply Chain Management	3
BUAD 6800	Information Technology And E-Business	3
BUAD 6900	Strategic Management Capstone	3
Must complete the MBA core course requirements in addition to the Finance Requirements		
Select three of the following:		9
FINA 6130	Advanced Corporate Finance	
FINA 6140	Investments And Security Analysis	
FINA 6150	Financial Institutions And Markets	
FINA 6340	Derivative Securities	
FINA 6370	MBA International Financial Management	
FINA 6480	Student Managed Portfolio (may count towards two of the three needed courses)	
FINA 6890	Financial Modeling and AI Applications	
Total Hours		**33**

Department Of Information Systems & Supply Chain Management

Chair: Dr. Paul Hong
Paul.Hong@utoledo.edu, 419.530.2054

Academic Advising for MBA and MABA provided by Rachel Schaeffer, M.B.A.
Rachel.Schaeffer@UToledo.edu, 419.530.5686

Mission

The John B. and Lillian E. Neff College of Business and Innovation provides innovative and relevant learning experiences and engages in high-quality research and teaching to prepare students to become life-long, ethical business and academic leaders who are prepared for global challenges.

Accreditations

The Master of Business Administration (M.B.A.), Master of Applied Business Analytics, and the Ph.D. in Manufacturing and Technology Management are accredited by Association to Advance Collegiate Schools of Business (AASCB).

Information, Operations and Technology Management Department offers programs in Operations and Supply Chain Management, Information Systems, Applied Business Analytics, and Manufacturing and Technology Management. Faculty members hold terminal degrees in information systems, operations and supply chain management, management science, statistics and industrial engineering. The department also is home to many lecturers, some with terminal degrees. It is also home to Distinguished University lecturer, Distinguished University professor and many faculty members with significant research contributions.

The department hosts two student chapters of national associations (UT-APICS (society serving Operations and supply chain majors) and AITP (Association for information Technology professionals)). The associations are very active hosting monthly or weekly meetings with professional presentations, factory visits, and other programs.

The department has fielded teams for case competitions (General Motors-Wayne State supply chain case competition in October and Ball State University Information Systems case competition in April) every year since their inceptions and has won awards in every Ball State competition and one GM-Wayne State competition.

Degrees Offered

MBA in Operations and supply chain management-STEM (p. 283)

Information, Operations and Technology Management Department offers the MBA in Operations and Supply Chain Management. As all MBA programs, it has a large core with three courses specializing in the Operations and Supply Chain Management. The three specialization courses along with the required core course and a pre-requisite course in analysis of manufacturing and service systems gives a good overview and an in-depth coverage on production planning and quality management. This program is ranked by Eduniversal as one of the best 100 programs in the country. Supply chain management research output of the department faculty was ranked well for supply chain research (SCM Journal List).

MBA in Information Systems - STEM (p. 283)

Information, Operations and Technology Management Department offers MBA in Information Systems. As all MBA programs, it has a large core with four required elective courses to earn a specialization in Information systems. The recently introduced fundamentals of Information systems course acts as bridge for students who have a different undergraduate specialization. Students with undergraduate specialization in information systems or computer science are waived out of this course. The program gives opportunity to learn ERP with special emphasis on configuration using SAP. Recent addition of courses in big data, data mining and business analytics makes this an attractive major.

MABA (Applied Business Analytics) - (p. 284) Available 100% online - STEM (p. 284)

The goal of this Master of Applied Business Analytics (MABA) program is to address the growing demand for analytical capabilities in solving business problems that are demanded by a variety of employers within the United States. Research results from public and private sectors show that there are substantially fewer experts in the field of business analytics than there are opportunities for them.

This program prepares students not only to be able to analyze and interpret data, but also to translate this into effective decision-making for complex business problems. The program is a unique combination of one functional area of business and a breadth of courses in business analytics capped by an internship at your place of work or in another organization. Another option is to cap the program with a 6-credit hour Master's thesis in the Neff College of Business and Innovation.

The Master of Applied Business Analytics degree is granted to students who satisfactorily complete a minimum of 30 semester hours at the 6000-level in the College of Business and Innovation meeting the program requirements. In addition, most non-business students and even some business students may need up to 9 credit hours of 5000-level pre-requisites.

Graduate Certificate in Business Analytics (p. 286) - (p. 284)Available 100% online

Graduate Certificate in Information Systems ERP/SAP (p. 286)

Graduate Certificate in Operations and Supply Chain Management (p. 287)

Code	Title	Hours
BUAD 6600	Supply Chain Management (MBA Core Course)	3
BUAD 6800	Information Technology And E-Business (MBA Core Course)	3
OSCM 5510	Data, Decisions and Operations (Common Body of Knowledge)	3
OSCM 6250	Essentials of Business Analytics	3
OSCM 6270	Simulation and Waiting Lines	3
OSCM 6350	Prescriptive Analytics	3
OSCM 6550	Business Analytics and Cases	3
OSCM 6680	Quality Management and Six Sigma	3
OSCM 6690	Supply Chain Resources Management	3
OSCM 6780	ERP Systems Process Management	3
OSCM 6950	Capstone Project	3
OSCM 6960	Masters Thesis	1-6
OSCM 6980	Special Topics in Operations and Supply Chain Management	3
OSCM 8690	Supply Chain Resources Management	3
INFS 6050	Information Systems Fundamentals	3
INFS 6150	Business Intelligence Management	3
INFS 6450	Data Mining	3
INFS 6560	Business Systems Analysis and Design	3
INFS 6610	Information Integration and Data Management	3

INFS 6710	Management of Information Systems Security	3
INFS 6780	ERP Systems Process Management	3
INFS 6790	ERP Systems Configuration and Integration	3
INFS 6810	Network Communications	3
INFS 6930	Contemporary Topics Seminar	3
INFS 8710	Management of Information Systems Security	3
MFGM 8960	Dissertation	1-8

MBA Operations and Supply Chain Management - STEM

overview

Information, Operations and Technology Management Department offers the MBA in Operations and Supply Chain Management. As all MBA programs, it has a business core with three courses specializing in the Operations and Supply Chain Management. The three specialization courses along with the required core course and a pre-requisite course in analysis of manufacturing and service systems gives a good overview and an in-depth coverage on production planning and quality management. This program is ranked by Eduniversal as one of the best 100 programs in the country. Supply chain management research output of the department faculty was ranked well for supply chain research (SCM Journal List). This is a STEM program.

Program Requirements

Operations and Supply Chain Management

The Operations and Supply Chain Management major provides the student with the decision-making and problem-solving skills required for managing people and resources more effectively, whether in manufacturing firms, service industries, nonprofit organizations or government operations. Students acquire the knowledge and skills to manage people, resources, and research operations from product design, process evaluation, TQM, facility layout, and planning and schedule perspective.

Code	Title	Hours
MBA Core Requirements		
BUAD 6100	Accounting For Decision Making	3
BUAD 6200	Corporate Finance	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6400	Results-Based Management	3
BUAD 6500	International Business	3
BUAD 6600	Supply Chain Management	3
BUAD 6800	Information Technology And E-Business	3
BUAD 6900	Strategic Management Capstone	3
Must complete the MBA core course requirements in addition to the following. Take the course listed below:		
OSCM 6680	Quality Management and Six Sigma	3
In addition, choose two of the courses listed below:		6
OSCM 6250	Essentials of Business Analytics	
OSCM 6270	Simulation and Waiting Lines	
OSCM 6350	Prescriptive Analytics	
OSCM 6550	Business Analytics and Cases	
OSCM 6690	Supply Chain Resources Management	
OSCM 6780	ERP Systems Process Management	
OSCM 6980	Special Topics in Operations and Supply Chain Management	
Total Hours		**33**

- PLO 1: The Operations and Supply Chain Management major provides the student with the decision-making and problem-solving skills required for managing people and resources more effectively, whether in manufacturing firms, service industries, nonprofit organizations or government operations.
- PLO 2: Students acquire the knowledge and skills to manage people, resources, and research operations from product design, process evaluation, TQM, facility layout, and planning and schedule perspective.

MBA Information Systems - STEM

overview

The Information Systems major provides the student with a managerial overview of computers and information systems. Emphasis is placed on the role and function of the computer as a managerial tool to store, process, analyze and present information. This is a STEM program.

Information Systems

The Information Systems major provides the student with a managerial overview of computers and information systems. Emphasis is placed on the role and function of the computer as a managerial tool to store, process, analyze and present information. Students majoring in Information Systems must complete the MBA core course requirements in addition to any three courses from the list below:

Electives

Code	Title	Hours
MBA Core Requirements		
BUAD 6100	Accounting For Decision Making	3
BUAD 6200	Corporate Finance	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6400	Results-Based Management	3
BUAD 6500	International Business	3
BUAD 6600	Supply Chain Management	3
BUAD 6800	Information Technology And E-Business	3
BUAD 6900	Strategic Management Capstone	3
Must complete the MBA core course requirements in addition to any three courses from the list below:		9
INFS 6050	Information Systems Fundamentals	
INFS 6150	Business Intelligence Management	
INFS 6450	Data Mining	
INFS 6560	Business Systems Analysis and Design (prerequisite BUAD 6800)	
INFS 6610	Information Integration and Data Management	
INFS 6710	Management of Information Systems Security	

INFS 6790	ERP Systems Configuration and Integration	
INFS 6810	Network Communications	
INFS 6930	Contemporary Topics Seminar (Repeatable with separate topics)	
Total Hours		**33**

- PLO 1: The Information Systems major provides the student with a managerial overview of computers and information systems. Emphasis is placed on the role and function of the computer as a managerial tool to store, process, analyze and present information

Master of Applied Business Analytics - available 100% online - STEM

The goal of this Master of Applied Business Analytics (MABA) program is to address the growing demand for analytical capabilities in solving business problems that are demanded by a variety of employers within the United States. Research results from public and private sectors show that there are substantially fewer experts in the field of business analytics than there are opportunities for them.

This program prepares students not only to be able to analyze and interpret data, but also to translate this into effective decision-making for complex business problems. The program is a unique combination of one functional area of business and a breadth of courses in business analytics capped by an internship at your place of work or in another organization.

The Master of Applied Business Analytics degree is granted to students who satisfactorily complete a minimum of 30 semester hours at the 6000 level in the College of Business and Innovation meeting the program requirements. In addition, most non-business students and even some business students may need up to 9 credit hours of 5000-level pre-requisites. This is a STEM program.

The admission decision will be based on a composite profile of the applicant including test scores, academic background, grades, work experience, letters of reference, and also the statement of purpose. The typical admitted student in the MABA program has at least a 2.7 undergraduate GPA and 480 on the GMAT or equivalent score in the GRE. Additional requirements include proficiency in spreadsheets and a programming language and a calculus course with C or better, both of which may be met by taking courses if necessary after a provisional admission. The following documents are required for admission to the program:

1. Official transcripts from each post-secondary institution attended.

2. Official GMAT scores sent directly from the Graduate Management Admissions Council (GMAC) or GRE score sent directly by the educational testing service to the College of Graduate Studies. The minimum GMAT score is 480 (equivalent score in the GRE) and must be no more than five years old.

3. The GMAT may be waived for applicants who have earned:

   a. An undergraduate degree or MBA from UToledo (minimum 3.0 GPA) within the last ten years

   or

   b. A Master in Economics, Statistics, Mathematics or Engineering (minimum 3.00 GPA) within the last ten years

4. Most recent resume or curriculum vitae including contact information for two references (name, title, place of employment, phone number and e-mail address).

5. A 400-word essay on statement of purpose.

Students interested in the pipeline program must submit the following:

1. BBA/Master of Applied Business Analytics Letter of Intent (https://www.utoledo.edu/business/COBI/COBIDocs/MBA-MSA-pipeline-letter-of-intent-fillable.pdf). This letter requires authorization from your undergraduate advisor that you are eligible to enroll in graduate courses and that you will continue to make progress toward your undergraduate degree,
2. a completed MABA graduate admission application,
3. at least 2 letter(s) of recommendation from faculty members.
4. After successful completion of the application process, students will be considered for admission to the graduate program.

In the case of students whose native language is not English, a score of 80 or above on the TOEFL IBT, PTE equal to 58 or above, Duolingo equal to 110 or above, or a 6.5 or above on the International English Language Testing System (IELTS) is mandatory.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall Semesters	August 1st
Spring Semesters	November 15th
Summer Semesters	April 15th

International students:

Fall Semesters	May 1st
Spring Semesters	October 1st
Summer Semesters	March 1st

Final admissions decisions will be withheld until the application for admission is complete. No materials submitted to the University will be returned to the applicant. The M.A.B.A. admits students to the program on a rolling admissions basis.

The Master of Applied Business Analytics degree is granted to students who satisfactorily complete a minimum of 30 semester hours at the 6000- level in the College of Business and Innovation meeting the program requirements. In addition, most non-business students and even some business students may need up to 12 credit hours of 5000 level pre-requisites.

Required CORE courses

Code	Title	Hours
INFS 6150	Business Intelligence Management	3
INFS 6450	Data Mining	3
OSCM 6250	Essentials of Business Analytics	3
OSCM 6350	Prescriptive Analytics	3
OSCM 6550	Business Analytics and Cases	03
Choose one of the following three options		
OSCM 6950	Capstone Project	3
BUAD 6920	Specialization Internship Opportunity	3
OSCM 6960	Masters Thesis	1-6

electives

Choose four courses (12 credit hours) from the same functional area of business (ACCT, FINA, INFS, MKTG, OSCM). An alternative is to select the administration functional area, which is designed for students who prefer to take a variety of electives in different functional areas.

Administration Functional area:

The MABA Administration functional area is designed for students who want the added flexibility of taking courses in a variety of functional areas. The Administration functional area is completed by taking four 6000-level courses from the current MABA elective course list from these functional areas of business (ACCT, FINA, INFS, MKTG and OSCM).

Code	Title	Hours
ACCT functional area		
BUAD 6100	Accounting For Decision Making	3
ACCT 6130	Advanced Financial Accounting	3
ACCT 6190	Contemporary Accounting Problems	3
ACCT 6250	Corporate Taxation	3
ACCT 6330	AIS Process, Technology, and Analytics	3
ACCT 6430	Business Valuation And Analysis	3
ACCT 6600	Data Analytics for Accountants	3
FINA functional area		
BUAD 6200	Corporate Finance (FINA 5310 is a prerequisite)	3
FINA 6130	Advanced Corporate Finance	3
FINA 6140	Investments And Security Analysis	3
FINA 6150	Financial Institutions And Markets	3
FINA 6340	Derivative Securities	3
FINA 6890	Financial Modeling and AI Applications	3
FINA 6750	Research In Finance Instructor permission only	3
INFS functional area		
BUAD 6800	Information Technology And E-Business	3
INFS 6560	Business Systems Analysis and Design	3
INFS 6610	Information Integration and Data Management	3
INFS 6710	Management of Information Systems Security	3
INFS 6790	ERP Systems Configuration and Integration	3
INFS 6930	Contemporary Topics Seminar	3
INFS 6810	Network Communications	3
MKTG functional area		
BUAD 6300	Strategic Marketing And Analysis	3
MKTG 6140	Relationship Marketing	3
MKTG 6220	Strategic Customer Insight & Analysis	3
MKTG 6230	Digital Marketing	3
MKTG 6240	Sales Force Leadership and Strategy	3
MKTG 6250	Global Sales and Sales Management	3
MKTG 6320	Strategic Brand Management	3
MKTG 6980	Special Topics	3
OSCM functional area		
BUAD 6600	Supply Chain Management	3
OSCM 6270	Simulation and Waiting Lines	3
OSCM 6680	Quality Management and Six Sigma	3
OSCM 6690	Supply Chain Resources Management	3
OSCM 6780	ERP Systems Process Management	3

Combined bachelor's to master's – BBA-MABA

Undergraduate students accepted to the BBA-MABA pipeline program option will be admitted to the Master of Applied Business Analytics (MABA) program and allowed to complete up to three graduate level classes (nine credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue into the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) one or two courses from the following MABA core courses (INFS 6150, OSCM 6250 or OSCM 6350) and one of the following courses based on the student chosen functional area (BUAD 6100, BUAD 6200, BUAD 6300, BUAD 6600, BUAD 6800 or INFS 6050) may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

- PLO 1. Reasonable mastery of business analytics covering concepts in statistics and modeling in the analysis of data for business decision making.
- PLO 2. Mastery of one area of applied business area.
- PLO 3. Gain experience in applying the tools and techniques of predictive and prescriptive analytics in the chosen area of applied business for improving business decision making.

Graduate Certificate in Business Analytics - available 100% online

A Graduate Certificate in Business is a program of study designed to help students understand a specific area of business and applications within the field. Ideal for both graduate students who seek to explore a specific area of concentration in business as well as working professionals seeking business education credentials to potentially advance in a current career or to build a foundation for a new career. Admissions to a graduate certificate does not guarantee admissions to a Neff College of Business and Innovation master's program. In order for courses to count toward a Neff College of Business and Innovation certificate or master's degree, a grade of "C" or better is required.

ADD A GRADUATE CERTIFICATE

If you are currently enrolled in a degree seeking program and wish to earn a certificate while pursuing this degree, please email Rachel Schaeffer (rachel.schaeffer@utoledo.edu). (rachel.schaeffer@utoledo.edu)

If you are not currently enrolled in a degree seeking program but wish to earn a certificate, please complete the Graduate Online application. Start application for Graduate Certificate in Business Analytics. (https://www.utoledo.edu/graduate/apply/)

Applicants Will Submit the Following:

- Transcripts showing evidence of a Bachelor's degree with at least a 2.7 cumulative G.P.A.
- Resume
- Application and Fee (if required)

for International Students:

- International Students currently pursuing a graduate degree (masters, Ph.D., MD, JD) at The University of Toledo are eligible to apply for graduate certificates in business.
- International students not currently enrolled in a graduate degree-seeking program with The University of Toledo are not eligible to apply for a graduate certificate program.

No GMAT or GRE will be required for admission to a Neff COBI graduate certificate, however if the student later applies to a graduate program at The University of Toledo, a GMAT/GRE score may be required. Refer to admission requirements for the program of interest.

Notes: Admissions to a Neff COBI graduate certificate program does not guarantee admissions to a Neff COBI master's program. For courses to count toward a Neff COBI certificate or master's degree, a grade of "C" or better is required.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall semester	August 1st
Spring semester	November 15th

International students:

Fall semester	May 1st
Spring semester	October 1st

Take the following four courses:

Code	Title	Hours
INFS 6150	Business Intelligence Management	3
INFS 6450	Data Mining	3
OSCM 6250	Essentials of Business Analytics	3
OSCM 6550	Business Analytics and Cases	3

Prerequisite: OSCM 5510 for Level GR with a minimum grade of C or equivalent UG/GR course from accredited University or equivalent experience (department chair signoff required).

- PLO 1. Gain an understanding of tools and techniques widely used in business analytics.
- PLO 2. Apply business analytics tools and techniques for improving business decision making.
- PLO 3. Develop communication and presentation skills in reporting results of business analytics effectively.
- PLO 4. Gain practical experience in applying business analytics tools and techniques in real word problems.

Graduate Certificate in Information Systems ERP/SAP

A Graduate Certificate in Business is a program of study designed to help students understand a specific area of business and applications within the field. Ideal for both graduate students who seek to explore a specific area of concentration in business as well as working professionals seeking business education credentials to potentially advance in a current career or to build a foundation for a new career. Admissions to a graduate certificate does not guarantee admissions to a Neff College of Business and Innovation master's program. In order for courses to count toward a Neff College of Business and Innovation certificate or master's degree, a grade of "C" or better is required.

ADD A GRADUATE CERTIFICATE

If you are currently enrolled in a degree seeking program and wish to earn a certificate while pursuing this degree, please email Rachel Schaeffer (rachel.schaeffer@utoledo.edu).

If you are not currently enrolled in a degree seeking program but wish to earn a certificate, please complete the Graduate Online application. Start application for Graduate Certificate in Information Systems ERP/SAP. (https://www.utoledo.edu/graduate/apply/)

Applicants Will Submit the Following:

- Transcripts showing evidence of a Bachelor's degree with at least a 2.7 cumulative G.P.A.
- Resume
- Application and Fee (if required)

for International Students:

- International Students currently pursuing a graduate degree (masters, Ph.D., MD, JD) at The University of Toledo are eligible to apply for graduate certificates in business.
- International students not currently enrolled in a graduate degree-seeking program with The University of Toledo are not eligible to apply for a graduate certificate program.

No GMAT or GRE will be required for admission to a Neff COBI graduate certificate, however if the student later applies to a graduate program at The University of Toledo, a GMAT/GRE score may be required. Refer to admission requirements for the program of interest.

Notes: Admissions to a Neff COBI graduate certificate program does not guarantee admissions to a Neff COBI master's program. For courses to count toward a Neff COBI certificate or master's degree, a grade of "C" or better is required.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall semester	August 1st
Spring semester	November 15th

International students:

Fall semester	May 1st
Spring semester	October 1st

Take the following three courses:

Code	Title	Hours
INFS 6150	Business Intelligence Management	3
INFS 6790	ERP Systems Configuration and Integration	3
OSCM 6780	ERP Systems Process Management	3

- PLO 1. Gain an understanding of the concepts of ERP (Enterprise Resource Planning) and be able to contrast it to traditional functionally oriented information systems
- PLO 2. Develop systematic analysis of the current ERP software
- PLO 3. Gain hands-on experiences with ERP software including core business processes and their integration
- PLO 4. Develop skills of ERP software to business reengineering and business workflow
- PLO 5. Apply business components and applications modules included in SAP ECC and relate them to common business processes

Graduate Certificate in Operations and Supply Chain Management

A Graduate Certificate in Business is a program of study designed to help students understand a specific area of business and applications within the field. Ideal for both graduate students who seek to explore a specific area of concentration in business as well as working professionals seeking business education credentials to potentially advance in a current career or to build a foundation for a new career. Admissions to a graduate certificate does not guarantee admissions to a Neff College of Business and Innovation master's program. In order for courses to count toward a Neff College of Business and Innovation certificate or master's degree, a grade of "C" or better is required.

ADD A GRADUATE CERTIFICATE

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If you are not currently enrolled in a degree seeking program but wish to earn a certificate, please complete the Graduate Online application. Start application for Graduate Certificate in Operations and Supply Chain Management. (https://www.utoledo.edu/graduate/apply/)

Applicants Will Submit the Following:

- Transcripts showing evidence of a Bachelor's degree with at least a 2.7 cumulative G.P.A.
- Resume
- Application and Fee (if required)

for International Students:

- International Students currently pursuing a graduate degree (masters, Ph.D., MD, JD) at The University of Toledo are eligible to apply for graduate certificates in business.
- International students not currently enrolled in a graduate degree-seeking program with The University of Toledo are not eligible to apply for a graduate certificate program.

No GMAT or GRE will be required for admission to a Neff COBI graduate certificate, however if the student later applies to a graduate program at The University of Toledo, a GMAT/GRE score may be required. Refer to admission requirements for the program of interest.

Notes: Admissions to a Neff COBI graduate certificate program does not guarantee admissions to a Neff COBI master's program. For courses to count toward a Neff COBI certificate or master's degree, a grade of "C" or better is required.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall semester	August 1st
Spring semester	November 15th

International students:

Fall semester	May 1st
Spring semester	October 1st

Take the following three courses:

Code	Title	Hours
BUAD 6600	Supply Chain Management	3
OSCM 6680	Quality Management and Six Sigma	3
OSCM 6690	Supply Chain Resources Management	3

Prerequisite: OSCM 5510 for Level GR with a minimum grade of C or equivalent UG/GR course from accredited university or equivalent experience (department chair signoff required).

- PLO 1. Gain an understanding of the basic concepts and principles of operations and supply chain management.
- PLO 2. Develop decision-making and problem-solving skills required for managing people and resources.
- PLO 3. Apply current and emerging technology to improve business competitiveness and productivity.
- PLO 4. Develop effective written and oral communications, critical thinking, team collaboration, and presentation skills as applied to business problems.

Department of Management

Chair: Dr. Laurence Fink
laurence.fink@utoledo.edu (), 419.530.2266

Academic Advising provided by Rachel Schaeffer
Rachel.Schaeffer@utoledo.edu (rachel.schaeffer@utoledo.edu), 419.530.5686

mission

The John B. and Lillian E. Neff College of Business and Innovation provides innovative and relevant learning experiences and engages in high-quality research and teaching to prepare students to become life-long, ethical business and academic leaders who are prepared for global challenges.

The Department of Management in the Neff COBI is a growing department that houses the Human Resource Management, General Management, Organizational Leadership and Management, and Entrepreneurship and Innovation majors. It provides cutting-edge programs and resources for students, faculty, and practitioners to develop the leadership, innovation and management, as well as human resource expertise required by organizations in the 21st century. The department is committed to excellence in all programs, practices, and research activities. We believe in collaborating with other departments, colleges, community, and business organizations to keep our programs viable and relevant. The department prides itself on having an outstanding reputation for excellence in teaching and research because of our dedication to providing the best service to our students. Our faculty and staff are dedicated to providing students with an excellent educational experience while simultaneously contributing to the management domain through research-based scholarship.

accreditation

The Master of Business Administration (M.B.A.) is accredited by the Association to Advance Collegiate Schools of Business (AASCB) and the Higher Learning Commission (HLC).

Degrees Offered

The length of the program will vary depending upon the nature of the undergraduate degree and the major selected. The program consists of a common body of knowledge (9 hours), core (24 hours) and elective (9 hours) courses. Any or all common body of knowledge courses may be waived for equivalent coverage at the undergraduate or graduate level with a grade of C or better. Any course subs for the core cannot also be utilized to meet major (elective) requirements.

We offer courses and experiences focused on action-oriented opportunities to help graduate students understand the field of management. This approach gives students a strong foundational knowledge that could be applied immediately after graduation.

MBA in Human Resource Management (p. 289) - Available 100% Online

The Human Resource Management major is designed both for students who intend to seek or continue managerial careers in human resources, and for those who are seeking more general leadership positions, but need to understand approaches to attracting, retaining, compensating, motivating and managing employees in contemporary organizations. This program is built around the view that human resource specialists must also have good business acumen to manage an organization's most valuable assets: Its employees.

Our program provides students a strong foundation in this field. The program teaches students about a wide variety of HR issues.

This concentration is designed to prepare candidates to assume positions as human resource practitioners in domestic and international business organizations, hospitals, nonprofits organizations, and local, state and federal government agencies.

MBA in Leadership (p. 289) - Available 100% Online

The Leadership major provides students with the background necessary to motivate and inspire employees to work towards a common goal, plan for the future and focus on organizational goals, evaluate and counsel individual and group performance, manage and resolve conflicts, and improve oral and written communication. A leadership career involves taking your organization into a better direction, or to surpass previous limits by building and working in a team to transform a group or business.

This concentration provides a foundation in a number of areas that are crucial to a managers' success – planning, ethical decision-making, interpersonal skills, team-building, performance development and evaluation, conflict management, motivation and leading change.

A specialization in leadership prepares students to enter a variety of organizations, both for profit and not-for-profit or to potentially work as an organizational development consultant.

Additionally, the department offers a graduate certificate in Leadership.

Graduate Certificate in Leadership (p. 290)

Code	Title	Hours
BUAD 6400	Results-Based Management MBA Core Course	3
EFSB 6590	New Venture Creation	3
EFSB 6690	Strategic Management of Innovation	3
HURM 6700	Human Resource Management	3
HURM 6720	Advanced Negotiation and Conflict Management	3
HURM 6730	Performance Management	3
HURM 6750	Current Topics In Human Resource Management	3
HURM 8750	Current Topics in Human Resource Management	3
MGMT 5110	Introduction To Management	3
MGMT 6100	Leading Through Ethical Decision-Making	3
MGMT 6150	Leading and Developing Yourself	3
MGMT 6190	Leading change and Organizational Improvement	3
MGMT 6200	Transitions to Leadership	3
MGMT 6930	Independent Research Instructor approval	1-3

MBA Human Resource Management - available 100% online

The Human Resource Management major is designed both for students who intend to seek or continue managerial careers in human resources, and for those who are seeking more general leadership positions, but need to understand approaches to attracting, retaining, compensating, motivating and managing employees in contemporary organizations. This program is built around the view that human resource specialists must also have good business acumen to manage an organization's most valuable assets: Its employees.

Our program provides students a strong foundation in this field. The program teaches students about a wide variety of HR issues.

This concentration is designed to prepare candidates to assume positions as human resource practitioners in domestic and international business organizations, hospitals, nonprofits organizations, and local, state and federal government agencies.

Human Resource Management

The Human Resource Management major is designed both for students who intend to seek or continue managerial careers in human resources, and for those who are seeking more general leadership positions, but need to understand approaches to attracting, retaining, compensating, motivating and managing employees in contemporary organizations.

Students are required to successfully complete HURM 6700 or its equivalent, by completing either an undergraduate degree in Human Resource Management from an AACSB-accredited school, or by certification through the Human Resource Certification Institute (e.g. PHR, SPHR).

Code	Title	Hours
MAB Core Requirements		
BUAD 6100	Accounting For Decision Making	3
BUAD 6200	Corporate Finance	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6400	Results-Based Management	3
BUAD 6500	International Business	3
BUAD 6600	Supply Chain Management	3
BUAD 6800	Information Technology And E-Business	3
BUAD 6900	Strategic Management Capstone	3
Must complete the MBA core course requirements in addition to three of the following Human Resources Requirements:		9
HURM 6700	Human Resource Management (Waived for UG AACSB-HR majors or PHR, SPHR Cert.) For students with HURM background, a substitute 6000 level course will be given based on department chair approval.	
HURM 6720	Advanced Negotiation and Conflict Management	
HURM 6730	Performance Management	
HURM 6750	Current Topics In Human Resource Management	
Total Hours		**33**

- PLO 1: Professionalism -- Each student can demonstrate effective oral and written communication, interpersonal collaboration, responsibility, accountability, and professional behavior.
- PLO 2: Leadership -- Each student can practice reflective thinking to assess personal strengths and challenges and can formulate strategies for lifetime development of leadership.
- PLO 3: Ethics and Social Responsibility -- Each student can analyze and resolve ethical issues in decision-making and recognize their impact on the larger community.
- PLO 4: Innovation and Creativity -- Each student can examine problems, opportunities, relationships, and situation from different and unique perspectives and develop creative solutions.
- PLO 5: Critical Thinking and Analysis -- Each student can think critically to identify problems, research, analyze and make sound inferences from and use effective problem-solving and decision-making techniques.
- PLO 6: Business Acumen -- Each student can identify, interpret, evaluate, and suggest solutions within the legal, global, financial, marketing, and operational dimensions of business.
- PLO 7: Technology -- Each student can understand and utilize current and emerging technology to improve business competitiveness and personal productivity.

MBA Leadership - available 100% online

The Leadership major provides students with the background necessary to motivate and inspire employees to work towards a common goal, plan for the future and focus on organizational goals, evaluate and counsel individual and group performance, manage and resolve conflicts, and improve oral and written communication. A leadership career involves taking your organization into a better direction, or to surpass previous limits by building and working in a team to transform a group or business.

This concentration provides a foundation in a number of areas that are crucial to a managers' success – planning, ethical decision-making,

interpersonal skills, team-building, performance development and evaluation, conflict management, motivation and leading change.

A specialization in leadership prepares students to enter a variety of organizations, both for profit and not-for-profit or to potentially work as an organizational development consultant.

Leadership

The Leadership major provides students with the background necessary to motivate and inspire employees to work towards a common goal, plan for the future and focus on organizational goals, evaluate and counsel individual and group performance, manage and resolve conflicts, and improve oral and written communication. Students majoring in Leadership must complete all of the following courses.

Code	Title	Hours
MBA Core Requirements		
BUAD 6100	Accounting For Decision Making	3
BUAD 6200	Corporate Finance	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6400	Results-Based Management	3
BUAD 6500	International Business	3
BUAD 6600	Supply Chain Management	3
BUAD 6800	Information Technology And E-Business	3
BUAD 6900	Strategic Management Capstone	3
Must complete the MBA core course requirements in addition to any three of the following four courses:		9
MGMT 6100	Leading Through Ethical Decision-Making	
MGMT 6150	Leading and Developing Yourself	
MGMT 6190	Leading change and Organizational Improvement	
MGMT 6200	Transitions to Leadership	
Total Hours		**33**

Graduate Certificate in Leadership - available 100% online

A Graduate Certificate in Business is a program of study designed to help students understand a specific area of business and applications within the field. Ideal for both graduate students who seek to explore a specific area of concentration in business as well as working professionals seeking business education credentials to potentially advance in a current career or to build a foundation for a new career. Admissions to a graduate certificate does not guarantee admissions to a Neff College of Business and Innovation master's program. In order for courses to count toward a Neff College of Business and Innovation certificate or master's degree, a grade of "C" or better is required.

ADD A GRADUATE CERTIFICATE

If you are currently enrolled in a degree seeking program and wish to earn a certificate while pursuing this degree, please email R (darlene.evans@utoledo.edu)achel Schaeffer (rachel.schaeffer@utoledo.edu).

If you are not currently enrolled in a degree seeking program but wish to earn a certificate, please complete the Graduate Online application.

Start application for Graduate Certificate in Leadership. (https://www.utoledo.edu/graduate/apply/)

Applicants Will Submit the Following:

- Transcripts showing evidence of a Bachelor's degree with at least a 2.7 cumulative G.P.A.
- Resume
- Application and Fee (if required)

for International Students:

- International Students currently pursuing a graduate degree (masters, Ph.D., MD, JD) at The University of Toledo are eligible to apply for graduate certificates in business.
- International students not currently enrolled in a graduate degree-seeking program with The University of Toledo are not eligible to apply for a graduate certificate program.

No GMAT or GRE will be required for admission to a Neff COBI graduate certificate, however if the student later applies to a graduate program at The University of Toledo, a GMAT/GRE score may be required. Refer to admission requirements for the program of interest.

Notes: Admissions to a Neff COBI graduate certificate program does not guarantee admissions to a Neff COBI master's program. For courses to count toward a Neff COBI certificate or master's degree, a grade of "C" or better is required.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall semester	August 1st
Spring semester	November 15th

International students:

Fall semester	May 1st
Spring semester	October 1st

Code	Title	Hours
Take any three of the following four courses:		9
MGMT 6100	Leading Through Ethical Decision-Making	
MGMT 6150	Leading and Developing Yourself	
MGMT 6190	Leading change and Organizational Improvement	
MGMT 6200	Transitions to Leadership	

- PLO 1. Demonstrate leadership and teamwork skills, including conflict resolution skills.
- PLO 2. Practice oral and written communication skills.
- PLO 3. Develop leadership and strategic thinking skills.
- PLO 4. Evaluate individual and group performance in meeting strategic organizational objectives and initiatives.

Department of Marketing

Chair: Dr. Laurence Fink

laurence.fink@utoledo.edu (), 419.530.2266

Academic Advising for the MBA program provided by Rachel Schaeffer, M.B.A.
Rachel.Schaeffer@Utoledo.edu, 419.530.5686

mission

The John B. and Lillian E. Neff College of Business and Innovation provides innovative and relevant learning experiences and engages in high-quality research and teaching to prepare students to become life-long, ethical business and academic leaders who are prepared for global challenges.

The Marketing Department offers areas of specialization and courses in Marketing and International Business. Each of these areas of specialization offer an opportunity to learn and develop skills in areas that are important to firms. Our marketing program provides students with the opportunity to develop a knowledge in advertising, product management, digital marketing and marketing research. International business provides student with opportunity to learn about exporting, foreign direct investment and managing and marketing in different cultures.

accreditation

The Master of Business Administration (M.B.A.) is accredited by the Association to Advance Collegiate Schools of Business (AASCB) and the Higher Learning Commission (HLC).

Degrees Offered

The length of the program will vary depending upon the nature of the undergraduate degree and the major selected. The program consists of a common body of knowledge (9 hours), core (24 hours) and elective (9 hours) courses. Any or all common body of knowledge courses may be waived for equivalent coverage at the undergraduate or graduate level with a grade of C or better. Any course subs for the core cannot also be utilized to meet major (elective) requirements.

Marketing - available 100% online

Marketing is one of the primary business functions that adds value to organizations of all types. Important areas of marketing include environmental scanning, planning, using social media, consumer behavior, global marketing, segmentation, marketing research, product and pricing strategies and brand management.

The curriculum prepares you for jobs, such as, marketing and development specialist, adverting account executive, marketing manager, and social media manager.

Graduate Certificate in Marketing (p. 292) - available 100% online

Code	Title	Hours
BUAD 6300	Strategic Marketing And Analysis (MBA Core Course)	3
BUAD 6500	International Business (MBA Core Course)	3
IBUS 6100	Study Abroad Program (Instructor approval)	3
IBUS 6990	Independent Study (Instructor approval)	1-3
MKTG 6140	Relationship Marketing	3
MKTG 6220	Strategic Customer Insight & Analysis	3
MKTG 6230	Digital Marketing	3
MKTG 6240	Sales Force Leadership and Strategy	3
MKTG 6250	Global Sales and Sales Management	3
MKTG 6320	Strategic Brand Management	3
MKTG 6400	International Marketing	3
MKTG 6980	Special Topics	3
MKTG 6990	Independent Study (Instructor approval)	1-3

MBA Marketing - available 100% online

The Marketing major provides the student with the skills to make decisions about product design and quality, pricing, channels of distribution, advertising, and personal selling in ways that enhance consumer satisfaction and further the goals of the organization. The student learns to approach problems with a clear understanding of the relationship between marketing and other business functions. There are three areas of concentration: Sales and Sales Management, International Marketing, and Marketing Management. While it is not possible for a specific concentration to be listed on the official transcript, students are encouraged to consider the coursework they select based on their career interests.

Marketing

The Marketing major provides the student with the key knowledge and skills to make decisions about an organization's marketing strategy, including digital marketing, customer relationships, and sales, in a domestic or international setting to further the goals of the organization. The student learns to approach problems with a clear understanding of the relationship between marketing and other business functions. Depending on how students package the courses, it allows a student to concentrate in marketing management, professional sales, or international marketing. Though it is not possible for a specific concentration to be listed on the official transcript, students majoring in Marketing are encouraged to consider the coursework they select based on their career interests.

Marketing Major

Code	Title	Hours
MBA Core Requirements		
BUAD 6100	Accounting For Decision Making	3
BUAD 6200	Corporate Finance	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6400	Results-Based Management	3
BUAD 6500	International Business	3
BUAD 6600	Supply Chain Management	3
BUAD 6800	Information Technology And E-Business	3
BUAD 6900	Strategic Management Capstone	3
In addition to required core classes, select three of the following courses (9 credit hours):		9
IBUS 6100	Study Abroad Program ( )	
MKTG 6140	Relationship Marketing	

MKTG 6220	Strategic Customer Insight & Analysis	
MKTG 6230	Digital Marketing	
MKTG 6250	Global Sales and Sales Management ( )	
MKTG 6400	International Marketing ( )	
MKTG 6980	Special Topics ( )	
Total Hours		**33**

Specializations Areas:

Students wishing to specialize in ***Sales & Sales Management*** should take MKTG 6250, MKTG 6140, and either MKTG 6980 (as applicable and approved by an advisor), MKTG 6220, OR MKTG 6230. If MKTG 6140 is not currently offered, select two from the "either" list.

Students wishing to specialize in ***International Marketing*** should take MKTG 6400, MKTG 6250, and either IBUS 6100 or MKTG 6980 (as applicable and approved by an advisor).

Students wishing to specialize in ***Marketing Management*** should take MKTG 6220 and MKTG 6230 along with one other course from the list.**

** When offered MKTG 6140 would be recommended.

- Upon completing this program, students will have fulfilled their core MBA course requirements in addition to specializing in the field of Marketing through the study of three of the following topics: 1. Study Abroad; 2. Relationship Marketing; 3. Strategic Customer Insight Analysis; 4. Digital Marketing; 5. Global Sales and Sales Management; 6. International Marketing; 7. Special Topics in Marketing.

Graduate Certificate in Marketing - available 100% online

A Graduate Certificate in Marketing is a program of study designed to help students understand a specific area of business and applications within the field. Ideal for both graduate students who seek to explore a specific area of concentration in business as well as working professionals seeking business education credentials to potentially advance in a current career or to build a foundation for a new career. Admissions to a graduate certificate does not guarantee admissions to a Neff College of Business and Innovation master's program. In order for courses to count toward a Neff College of Business and Innovation certificate or master's degree, a grade of "C" or better is required.

ADD A GRADUATE CERTIFICATE

If you are currently enrolled in a degree-seeking program and wish to earn a certificate while pursuing this degree, please email R (darlene.evans@utoledo.edu)achel Schaeffer (rachel.schaeffer@utoledo.edu).

If you are not currently enrolled in a degree seeking program but wish to earn a certificate, please complete the Graduate Online application. Start application for Graduate Certificate in Marketing. (https://www.utoledo.edu/graduate/apply/)

Applicants Will Submit the Following:

- Transcripts showing evidence of a Bachelor's degree with at least a 2.7 cumulative G.P.A.
- Resume
- Application and Fee (if required)

for International Students:

- International Students currently pursuing a graduate degree (masters, Ph.D., MD, JD) at The University of Toledo are eligible to apply for graduate certificates in business.
- International students not currently enrolled in a graduate degree-seeking program with The University of Toledo are not eligible to apply for a graduate certificate program.

No GMAT or GRE will be required for admission to a Neff COBI graduate certificate, however if the student later applies to a graduate program at The University of Toledo, a GMAT/GRE score may be required. Refer to admission requirements for the program of interest.

Notes: Admissions to a Neff COBI graduate certificate program does not guarantee admissions to a Neff COBI master's program. For courses to count toward a Neff COBI certificate or master's degree, a grade of "C" or better is required.

Applications for admission are considered on a rolling basis. However, students are encouraged to submit their applications by the following dates:

Domestic students:

Fall students	August 1st
Spring semester	November 15th

International students:

Fall semester	May 1st
Spring semester	October 1st

Take any three (9 credits hours) graduate level marketing electives from the list below:

Code	Title	Hours
MKTG 6140	Relationship Marketing	3
MKTG 6220	Strategic Customer Insight & Analysis	3
MKTG 6230	Digital Marketing	3
MKTG 6250	Global Sales and Sales Management	3
MKTG 6400	International Marketing	3
MKTG 6980	Special Topics	3

- PLO 1. Solve business problems using their knowledge of the relationship between marketing and other business functions.
- PLO 2. Determine the appropriate product, pricing, channels of distribution, and promotion strategies to meet consumer expectations and further the goals of the organization.
- PLO 3. Evaluate when and why relationship marketing practices can be advantageous or detrimental to marketing and organizational performance.

- PLO 4. Apply strategic planning across the functional areas of marketing communications.
- PLO 5. Create an integrated marketing communication proposal that would synergistically combine pertinent tools to reach selected audiences.

Dual Degrees/Joint Plan of Study

Degrees Offered

-
- J.D./M.B.A. Dual Degree (p. 293)
- M.P.H./M.B.A. Dual Degree (p. 294)
- PharmD./M.B.A. Dual Degree (p. 294)
- MD/MBA Dual Degree (p. 295)

B.S./M.B.A. Dual Degree

The B.S./M.B.A. program provides an opportunity to earn a dual degree through an integrated curriculum. Successful completion of the dual degree program leads to the awarding of two degrees. The B.S. in Engineering or Engineering Technology degree is awarded by the College of Engineering and the M.B.A. degree is awarded by the John B. and Lillian E. Neff College of Business and Innovation. Students enrolled in the dual degree program will receive the B.S. and M.B.A. degrees independently. Students must complete their B.S. degree prior to graduating with their M.B.A. It is anticipated that by enrolling in the two programs simultaneously, a total of five years will be required for completion of both degrees.

Students who wish to pursue the program should make this known to the senior associate dean for undergraduate studies in the College of Engineering and the Neff College of Business and Innovation Graduate Programs Office by the end of their sophomore year if pursuing a business minor. Interested students should apply for admission to the program to the College of Graduate Studies before the fall of their senior year. To be admitted to the program, students must have senior standing, and have at least a 3.0 cumulative GPA. Undergraduate equivalents to the MBA Common Body of Knowledge must be completed prior to admission.

To fulfill requirements for the M.B.A. degree, students must complete 33 semester hours at the 6000-level. Up to an additional 9 credit hours may be required if a student does not have an academic background in business. Students in the joint program may apply all undergraduate equivalents toward the 9 hours of coursework required for the Common Body of Knowledge. The undergraduate business courses should be chosen carefully to be used specifically toward the M.B.A. Common Body of Knowledge courses. All courses taken that are applied towards the M.B.A. program requirements must be earned with a grade of C (2.0) or higher.

Contact the Neff College of Business and Innovation Graduate Advisor with any questions regarding the specific undergraduate course equivalents.

J.D./M.B.A. Dual Degree

The J.D./M.B.A. program provides an opportunity to earn a dual degree through an integrated curriculum. Successful completion of the dual degree leads to the awarding of two degrees. The Juris Doctor degree is awarded by the College of Law, and the M.B.A. degree is awarded by the John B. and Lillian E. Neff College of Business and Innovation. Students enrolled in the dual degree program will not receive the J.D. or M.B.A. degree until all work required for both degrees have been completed.

Students must apply and be admitted to both programs separately. Admission to one program does not guarantee admission to the other program. There are separate applications and fees for each program.
 It is recommended that students speak to the College of Law prior to enrolling in the dual degree program as some courses have to be taken in sequence to meet the J.D. program degree requirements.

Juris Doctor (J.D.)

The College of Law requires the successful completion of 89 credit hours. A maximum of 15 credit hours can be online course work. The dual degree program would permit up to 12 credit hours of M.B.A. courses from the College of Business and Innovation to be applied toward the satisfaction of the 89 credit hour requirement. All courses taken in the College of Business that are to be applied towards J.D. program requirements must be earned with a grade of B (3.0) or higher. The 12 hours of approved courses from the College of Business and Innovation are:

Code	Title	Hours
Select 12 hours of the following:		**12**
BUAD 6100	Accounting For Decision Making	3
BUAD 6200	Corporate Finance	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6500	International Business	3
BUAD 6800	Information Technology And E-Business	3
BUAD 6900	Strategic Management Capstone	3
EFSB 6590	New Venture Creation	3
EFSB 6790		3
FINA 6130	Advanced Corporate Finance	3
FINA 6140	Investments And Security Analysis	3
FINA 6150	Financial Institutions And Markets	3
FINA 6370	MBA International Financial Management	3
IBUS 6360		3
MGMT 6160		3
HURM 6720	Advanced Negotiation and Conflict Management	3
HURM 6760		3
INFS 6810	Network Communications	3
MKTG 6140	Relationship Marketing	3
MKTG 6400	International Marketing	3

On written application by the student, and for good cause shown, the Associate Dean for Academic Affairs of the College of Law may substitute another College of Business course for one on the approved list.

M.B.A. Degree

Students in the J.D./M.B.A. will be majoring in Administration. If students opt to double major, all courses needed for the double major will need to be successfully completed. To fulfill requirements for the M.B.A. degree, students must complete 33 semester hours at the 6000 level or above. Up to an additional 9 credit hours may be required if a student does not have an academic background in business. Students in the joint program may apply up to 12 hours of course work at the College of Law toward satisfaction of the M.B.A. program requirements. The College of Law courses must have business application. All courses taken in the College of Law that are to be applied towards M.B.A. program requirements must be earned with a grade of B (3.0) or higher. All grades earned in College of Law courses that are applied towards M.B.A. program requirements will impact the overall graduate GPA.

One M.B.A. Core course (BUAD 6500 (https://catalog.utoledo.edu/search/?P=BUAD%206500)) can be replaced with one College of Law elective (LAWI 9480 (https://catalog.utoledo.edu/search/?P=LAWI%209480)).

Up to three College of Law courses listed below will serve as M.B.A. electives. Other College of Law courses may be approved by the College of Business and Innovation Associate Dean for Graduate Programs, to serve as M.B.A. electives. Students in the dual degree program will earn their MBA in Administration since the MBA electives are replaced with College of Law courses.

Code	Title	Hours
Select up to three of the following:		**9**
LAWG 9010	Business Associations	4
LAWG 9610	Secured Transactions	3
LAWI 9060	Sales and Leases of Goods	2-3
LAWI 9300	Employment Discrimination	3
LAWI 9110	Commercial Paper	3
LAWI 9310	Employment Law	2-3
LAWI 9940	White Collar Crime	2-3
LAWN 9050	Negotiation and Settlement	2-3
LAWD 9210	Contracts I	3
LAWD 9220	Contracts II	3

M.P.H./M.B.A. Dual Degree

The M.P.H./M.B.A. program provides an opportunity to earn a dual degree through an integrated curriculum. The joint M.B.A./MPH degree is designed to prepare graduates with managerial and executive level career aspirations at the interface of healthcare delivery and business. The successful completion of the dual degree leads to the awarding of two degrees. The M.P.H. degree is awarded by the College of Health and Human Services and the M.B.A. is awarded by the John B. and Lillian E. Neff College of Business and Innovation. Students enrolled in the dual degree program can receive the M.P.H. or M.B.A. degree independently. The M.B.A. degree requires a minimum of 33 credit hours at the 6000-level. Up to an additional 9 credit hours may be required if a student does not have an academic background in business. The College of Business and Innovation will allow up to 9 credit hours of appropriate M.P.H. coursework to be credited toward the M.B.A. degree.

Students applying for the M.P.H./M.B.A. dual degree program must have earned a bachelor's degree. A student must apply and be admitted to the College of Health and Human Services and the John B. and Lillian E. Neff College of Business and Innovation separately to be admitted to the M.P.H./M.B.A dual degree program.

Admission to one program does not guarantee admission to the other program. Refer to the College of Health and Human Services (p. 64) and M.B.A. (https://catalog.utoledo.edu/graduate/business-innovation/departments-schools/college-programs/mba/#requirementstext) sections of this catalog for specific admission standards for each program.

Appropriate M.P.H. courses listed under the Public Health Management major of this catalog will be applied towards the M.B.A. elective area. Up to a maximum of 12 credit hours of 6000-level BUAD courses will apply towards the M.P.H. elective requirement.

Please refer to the College of Health and Human Services (p. 64)catalog for more information regarding the program requirements for the M.P.H. degree.

Pharm D./M.B.A. Dual Degree

The PharmD./M.B.A. program provides an opportunity to earn a dual degree through an integrated curriculum. Successful completion of the dual degree program leads to the awarding of two degrees. The PharmD. Degree is awarded by the College of Pharmacy and Pharmaceutical Sciences, and the M.B.A. degree is awarded by the John B. and Lillian E. Neff College of Business and Innovation. Students enrolled in the dual degree program can receive the PharmD. or M.B.A. degree independently. The M.B.A. degree requires a minimum of 33 credit hours at the 6000 level. Up to an additional 9 credit hours may be required if a student does not have an academic background in business.

Students applying for the PharmD./M.B.A. program must have earned a bachelor's degree. A student must apply and be admitted to the College of Pharmacy and Pharmaceutical Sciences and the John B. and Lillian E. Neff College of Business and Innovation separately to be admitted to the PharmD./M.B.A dual degree program.

Admission to one program does not guarantee admission to the other program. Refer to the College of Pharmacy and Pharmaceutical Science (p. 242) and M.B.A. sections of this catalog for specific admission standards for each program.

Admission to one program does not guarantee admission to the other program. There are separate applications and fees for each program. Students apply and are admitted to the PharmD program after two years of preparatory course work in chemistry, calculus, biology, organic chemistry, physics, and physiology. Students apply for entry into the 4-year professional PharmD program in their Sophomore year. In the first year in the PharmD program, the student's junior year, they would begin their coursework towards the M.B.A. by completing the undergraduate level equivalent Common Body of Knowledge course requirements. Students interested in declaring a business minor would contact the COBI Undergraduate Advisors in the Undergraduate Student Services Center. Students in the PharmD program graduate after the first two professional

years, four years of higher education, with a BS in Pharmaceutical Sciences.

PharmD students complete their last two years of the PharmD program at the graduate level. Up to 9 additional credit hours may be required if a student does not have the Common Body of Knowledge courses completed with a grade of C or higher. Once a student is admitted and enrolls at the graduate level, the Common Body of Knowledge courses must be taken at the Graduate level. Students are not permitted to enroll in and apply undergraduate courses toward MBA degree requirements. *Up to three College of Pharmacy and Pharmaceutical Science courses will serve as M.B.A. electives. The nine credit hours of elective course work will be fulfilled by a combination of (2) APPE rotations from the Management, Leadership, or Administration Track, and (1) IPPE rotation from the Management, Leadership, or Administration Track, and other PHPR courses as listed in the table below. Students in the dual degree program will earn their MBA in Administration.* The following table identifies each M.B.A. course and describes how the student will complete the work.

M.B.A. Prerequisites

Code	Title	Hours
Common Body of Knowledge		
Courses Take by Pharm D Students		
BUAD 2040 & BUAD 2050	Financial Accounting Information and Accounting For Business Decision-Making	6
BUAD 3040	Principles Of Financial Management	3
ECON 1150 & ECON 1200	Principles Of Macroeconomics and Principles Of Microeconomics	6
Select one of the following:		
PHPR 4530	Evidence Based Medicine 1	
PHPR 4540	Evidence Based Medicine 2	
Any Statistics I equivalent course		
BUAD 3020	Principles Of Manufacturing And Service Systems	3
Total Hours		**18**

M.B.A. Curriculum

Code	Title	Hours
MBA Core Courses		
BUAD 6100	Accounting For Decision Making	3
BUAD 6200	Corporate Finance	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6400	Results-Based Management	3
BUAD 6500	International Business	3
BUAD 6600	Supply Chain Management	3
BUAD 6800	Information Technology And E-Business	3
BUAD 6900	Strategic Management Capstone	3
Electives		
PHPR 8940	Clinical Clerkship	4
PHPR 8940	Clinical Clerkship ((Advanced Pharmacy Practice Experience))	4
PHPR 6920	Introductory Pharmacy Practice Experience 5	1
PHPR 6010	Leadership and the Military Healthcare Professional	2

This plan of study would result in the student having a M.B.A. major in Administration. Students seeking a double major would be required to successfully meet the requirements set forth for each major.

The following table displays a potential matriculation pathway for this dual degree program.

Potential Matriculation Pathway

Year	Fall Semester	Spring Semester	Summer Semester
1	Pre-prof Pharmacy Courses	Pre-prof Pharmacy Courses	
2	Pre-prof Pharmacy Courses	Pre-prof Pharmacy Courses	
	Application and admission into the PharmD degree		
3	PharmD Coursework	PharmD Coursework	BBA Coursework
4	PharmD Coursework	PharmD Coursework[1]	4 M.B.A. courses
		1 BBA course	
5	PharmD Coursework	PharmD Coursework	M.B.A. Coursework
	2 M.B.A. course	1 M.B.A. course	
6	APPE Experiences	APPE Experiences	

[1] Students graduate with BSPS degree after the Spring semester year 2 (Fourth Term).

BBA - Bachelors of Business Administration
M.B.A. - Masters of Business Administration

- PLO 1: Participate in experiences and interactions with patients, pharmacists, pharmacy techs and other health care providers in community, institutional, and other pharmacy or healthcare settings.

M.D./M.B.A. Dual Degree

The M.D./M.B.A. program provides an opportunity to earn a dual degree through an integrated curriculum. Successful completion of the dual degree program leads to the awarding of two degrees. The Doctor of Medicine is awarded by the College of Medicine and Life Sciences and the M.B.A. is awarded by the John B. and Lillian E. Neff College of Business and Innovation. Students enrolled in the dual degree program will not receive the M.D. or M.B.A. degree until all work required for both degrees have been completed. The M.B.A. degree requires a minimum of 33 credit hours at the 6000-level. Up to an additional 9 credit hours may be required if a student does not have an academic background in business. The Neff College of Business and Innovation will allow up to 9 credit hours of approved M.D. coursework to be credited toward the M.B.A. degree.

Students applying for the M.D./M.B.A. program must have earned a bachelor's degree. A student must apply and be admitted to the College of Medicine and Life Sciences and the John B. and Lillian E. Neff College of Business and Innovation separately to be admitted to the M.D./M.B.A dual degree program.

Admission to one program does not guarantee admission to the other program. Refer to the College of Medicine (p. 156) and M.B.A. (https://catalog.utoledo.edu/graduate/business-innovation/departments-schools/college-programs/mba/#admissiontext) sections of this catalog for specific admission standards for each program. Applications for admission to the M.D. program are accepted for fall entry only.

CELL 780/Thread1, MSNB 785/Thread2, ECOS 790/Thread3 are already part of the MD (curriculum and will serve to fulfill the three MBA elective requirements (9 credit hours) when taken over multiple semesters for the required number of credit hours when a satisfactory grade is earned.

Code	Title	Hours
CELL 780	Thread 1: Cellular Disease	20
ECOS 790	Thread 3: ECOSystems	12
MSNB 785	Thread 2: Bones Neuro Behavior	28

Year	Fall Semester	Spring Semester	Summer Semester
1	Medical School	Med School	Business School (term 1 only)
2	Medical School	Med School	USMLE Step 1 Bridge course/ Business School (term 1 only)
3	Business School	Bus School	Medical School (Clinical Clerkships)
4	Medical School (Clinical Clerkships)	Med School (Clinical Clerkships)	Medical School (Electives)
5	Medical School (Electives)	Med School (Electives)	

Professional Programs

- MBA Administration (p. 296) - available 100% online
- EMBA Executive Management (p. 297)
- MBA Public Health Management (p. 298) - available 100% online

MBA Administration - available 100% online

Master of Business Administration (M.B.A.)

The John B. and Lillian E. Neff College of Business and Innovation's flexible Master of Business Administration (M.B.A.) program is the ideal graduate program for those that strive to challenge themselves and progress in their career. All of our graduate students have hands-on opportunities to learn practical business applications and network with professionals from all industries and fields.

UToledo's AACSB-accredited M.B.A. program has a market-relevant curriculum and a variety of specializations. Expert faculty members give students an in-depth, well-rounded knowledge of business analysis and strategy. Recognized by the Princeton Review as One of the "Best Business Schools," the University of Toledo Will Help You Reach New Career Heights and Fuel Your Tomorrows.

Flexibility

Begin the program in the Fall, Spring or Summer and progress at your own pace. Courses are offered in-class, online and a blend of the two learning modes enabling multiple options to suit your busy life and work schedule.

Affordability

One of the best values in the Midwest, the UToledo M.B.A. offers affordable tuition and opportunities for scholarships. Many students take advantage of employer-sponsored tuition assistance to subsidize their graduate education costs.

Work/Life Balance

Courses are offered in-class during the evenings, fully online, or a hybrid blend of the two learning modes. Students typically schedule classes to facilitate maximum work/life balance.

Pipeline Program

Our pipeline program permits UToledo John B. and Lillian E. Neff College of Business and Innovation undergraduate students to take graduate degree program courses at the undergraduate price. These classes may “double-dip,” counting towards the completion of both a B.B.A. and graduate degree.

Speed to Degree Completion

A full time student, taking 3 courses per semester, can complete the degree in as little as 4 semesters (excluding summer). The typical working professional, taking 2 courses per semester, can complete the degree in as little as six semesters.

Academic Reputation

The UToledo M.B.A. program is fully accredited by the Association to Advance Collegiate Schools of Business (AACSB), which represents one of the highest standards of achievement for business schools worldwide. The program is a member of the Graduate Management Admission Council (GMAC), an international association of business schools distinguished by their commitment to excellence in graduate management education.

Employer Connections

The John B. and Lillian E. Neff College of Business and Innovation consistently builds its relationships with local and national companies, forming valuable partnerships to provide our M.B.A. students with employment and career-building opportunities.

For a MBA Administration, you must complete the MBA core course requirements (https://catalog.utoledo.edu/graduate/business-

innovation/departments-schools/college-programs/mba/) in addition to the following:

Code	Title	Hours
BUAD 6100	Accounting For Decision Making	3
BUAD 6200	Corporate Finance	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6400	Results-Based Management	3
BUAD 6500	International Business	3
BUAD 6600	Supply Chain Management	3
BUAD 6800	Information Technology And E-Business	3
BUAD 6900	Strategic Management Capstone	3
Administration Required Courses		
Three 6000-level M.B.A. electives within the College of Business and Innovation		9
Students are not permitted to take PUBH courses from the Public Health Management major toward the Administration major. However, students are permitted to complete BLAW 6100 Business, Government and Society, EFSB 6590 New Venture Creation, or EFSB 6690 Technology Commercialization.		
Total Hours		**33**

- PLO 1: Professionalism -- Each student can demonstrate effective oral and written communication, interpersonal collaboration, responsibility, accountability, and professional behavior
- PLO 2: Leadership -- Each student can practice reflective thinking to assess personal strengths and challenges and can formulate strategies for lifetime development of leadership
- PLO 3: Ethics and Social Responsibility -- Each student can analyze and resolve ethical issues in decision-making and recognize their impact on the larger community
- PLO 4: Innovation and Creativity -- Each student can examine problems, opportunities, relationships, and situation from different and unique perspectives and develop creative solutions.
- PLO 5: Critical Thinking and Analysis -- Each student can think critically to identify problems, research, analyze and make sound inferences from and use effective problem-solving and decision-making techniques
- PLO 6: Business Acumen -- Each student can identify, interpret, evaluate, and suggest solutions within the legal, global, financial, marketing, and operational dimensions of business
- PLO 7: Technology -- Each student can understand and utilize current and emerging technology to improve business competitiveness and personal productivity

EMBA Executive Management

Admission to Executive Master of Business Administration (E.M.B.A.) Program

The E.M.B.A. program is designed for executives and professionals with a minimum of three to five years of management or professional experience. The E.M.B.A. Admissions Committee seeks candidates with proven leadership potential. The following documents are required for admission to the program:

1. Official transcripts from each post-secondary institution attended.
2. A current resume to allow the Admissions Committee the opportunity to assess the individual's work experience.

All applicants to the E.M.B.A. program are also required to interview with the Admissions Committee. The interview will take place once the application for admission has been completed. Applications for admission are considered on a rolling basis for fall entry only. Final admissions decisions will be withheld until the application for admission is complete. No materials submitted to the University will be returned to the applicant.

Code	Title	Hours
Required Courses		
EMBA 5500	Analytical Foundation For Executives	3
EMBA 6140	Financial Foundations For Executives	3
EMBA 6220	Accounting For Operational And Strategic Management	3
EMBA 6230	Marketing Analysis And Strategy	3
EMBA 6250	Leadership And Performance Management	3
EMBA 6290	Strategic Management	3
EMBA 6300	Information Technology Management	3
EMBA 6310	Global Supply Chain Management	3
Elective Courses		
Select two courses (6 hours) of any 6000 level MBA elective courses.		6
Total Hours		**30**

- Develop team skills needed to build an effective organizational environment. Teamwork goal may be assessed by measuring one or more of the following core skills/competencies: collaboration, interpersonal skills, group dynamics, adaptability, ability to follow leader.
- Communication – Develop the ability to effectively communicate. Communication goal may be assessed by measuring one or more of the following core skills/competencies: oral and written communication; listening, language, and presentation skills; cultural sensitivity.
- Decision Making – Develop the ability to critically assess issues and develop sound, responsible, ethical, and creative solutions. Decision making goal may be assessed by measuring one or more of the following core skills/competencies: critical thinking, analytical skills, quantitative/qualitative analysis, information gathering and problem solving skills, adaptability, ethics, technology use, integration of business functions.
- Leadership – Develop the skills necessary for creating a high-performance, results-based organization. Leadership goal may be assessed by measuring one or more of the following core skills/competencies: interpersonal skills, strategic thinking and vision, innovation and creativity, business planning, intra/entrepreneurship, ethics, adaptability, integrity, management skills which include human capital, administration, delegation, and negotiation).
- Global – Equip students to be effective in a global environment and have an understanding of global business issues and their impact on the organization and society. Global goal may be assessed by measuring one or more of the following core skills/competencies:

cross-cultural understanding and sensitivity, supply chains, technology management.

MBA Public Health Management - available 100% online

The Public Health Management major is designed for students who intend to seek or continue managerial careers in healthcare administration. This is different that the dual degree MPH/MBA program option. The joint MPH/MBA degree is designed to prepare graduates with managerial and executive-level career aspirations at the interface of healthcare delivery and business.

Students are not able to apply any of the courses required for the Public Health Management major towards open electives or the MBA in Administration major.

Public Health Management

The Public Health Management major is designed for students who intend to seek or continue managerial careers in healthcare administration. Students are not able to apply any of these courses towards the MBA Administration major. Students majoring in Public Health Management must complete all of the following courses.

Code	Title	Hours
MBA Core Requirements		
BUAD 6100	Accounting For Decision Making	3
BUAD 6200	Corporate Finance	3
BUAD 6300	Strategic Marketing And Analysis	3
BUAD 6400	Results-Based Management	3
BUAD 6500	International Business	3
BUAD 6600	Supply Chain Management	3
BUAD 6800	Information Technology And E-Business	3
BUAD 6900	Strategic Management Capstone	3
Must complete the MBA core course requirements in addition to three of the following courses:		9
PUBH 6000	Quantitative and Qualitative Data Analysis in Public Health	
PUBH 6010	Public Health Epidemiology	
PUBH 6020	Management and Leadership in Public Health	
PUBH 6050	Concepts and Issues in Environmental Health	
PUBH 6080	Social Determinants of Health	
PUBH 6090	Issues in Public Health	
PUBH 6310	Public Health Assessment and Planning	
PUBH 6620	Introduction to Health Policy and Health Systems	
Total Hours		**33**

Judith Herb College of Arts, Social Sciences and Education

Graduate Catalog 2026-2027

mission

The Judith Herb College of Arts, Social Sciences, and Education leads liberal arts education and research programs at the University of Toledo. Through our programs in the arts, humanities, social sciences, and education we prepare students to excel as creative, ethical, collaborative, and global citizens.

Office of the Dean

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Accreditation Agencies

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Council for Accreditation of Educator Preparation (CAEP).
American Bar Association (ABA)
American Psychological Association (APA) Commission on
 Accreditation
National Association of Schools of Art and Design (NASAD)
National Association of Schools of Music (NASM)
National Association of Schools of Theatre (NAST)
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Graduate Degrees/Certificates Offered

Humanities

- English (M)
- History (M, PhD)

Disability Studies

- Joint Program in Law and Disability Studies (https://www.utoledo.edu/law/academics/joint-degrees/disability-studies.html)

Interdisciplinary Studies

- M.A. in Interdisciplinary Studies (p. 361)

Social Sciences

- Economics (M)
- Geography and Planning (M)
- Public Administration (M)
- Psychology (M, PhD)
- Spatially Integrated Social Sciences (PhD)

accreditation

The Education programs in the Judith Herb College of Arts, Social Sciences, and Education are fully accredited by the Council for Accreditation of Educator Preparation (CAEP). This accreditation status is effective between fall 2023 and fall of 2030. The next on-site visit will take place in spring 2030. Additionally, all licensure programs are approved by the Ohio Department of Higher Education.

Education Programs

Master's Degrees

Master of Education in Career and Technical Education (p. 382)

Master of Education in Curriculum and Instruction (p. 384)

Master of Education in Early Childhood Education (p. 386)

Master of Education in Educational Administration and Supervision (p. 320)

Master of Education in Educational Theory and Social Foundations (p. 321)

Master of Education in Higher Education (p. 323)

Master of Education in Middle Childhood Education (p. 387)

Master of Education in Secondary Education (p. 390)

Master of Education in Special Education (p. 396)

Education Specialist Degrees

Education Specialist in Curriculum and Instruction (p. 377)

Doctoral Degrees

Doctor of Philosophy in Curriculum and Instruction (p. 398)

- Concentrations: Curriculum and Instruction, and Special Education

Doctor of Philosophy in Foundations of Education (p. 324)

- Concentrations: Educational Psychology and Foundations of Education

Doctor of Philosophy in Higher Education (p. 327)

Graduate Certificates

Certificate in Advance Reading and Literacy Instruction (p. 378)

Certificate in Career-based Intervention (p. 379)

Certificate in Peace and Justice Studies (https://catalog.utoledo.edu/graduate/arts-social-sciences-education/departments/educational-studies/peace-and-justice-studies-certificate/)

Certificate in Higher Education Administration (p. 318)

Certificate in PreKindergarten Special Needs (p. 380)

Certificate in Principal Licensure (p. 319)

Certificate in Transition to Work (p. 382)

Graduate Certificate Programs

- Applied Social Research (p. 360)
- Data Analytics in Economics (p. 305)
- GIS and Applied Geography (p. 334)
- Health Care Policy and Administration (p. 343)
- Spanish Translation and Interpretation (p. 404)
- Teaching of Writing (p. 331)
- Urban and Regional Planning (p. 334)
- Municipal Administration (p. 344)
- Management of Non-Profit Organization (p. 343)
- Peace and Justice Studies (https://catalog.utoledo.edu/graduate/arts-social-sciences-education/departments/educational-studies/peace-and-justice-studies-certificate/)

College Policies (Graduate Handbook)

College Of Graduate Studies

- College of Graduate Studies (p. 407)
- College Policies and Procedures and Handbook (p. 407)
- Academic Regulations (p. 412)
- Graduate Academic Policies (https://www.utoledo.edu/policies/academic/graduate/)

Judith Herb College of Arts, Social Sciences and Education

The Judith Herb College of Arts, Social Sciences and Education adheres to all of The University of Toledo policies and procedures. Please refer to the General Section (https://catalog.utoledo.edu/general-section/) of this catalog for academic policies governing all students enrolled at the University. In any case where University, college, departmental and/or program policies conflict, the most stringent policy applies. Students should consult with their program for a complete list of all policies and procedures specifically related to their program. Refer to the UToledo Policy web site (http://www.utoledo.edu/policies/) for most recent policies.

Licensure and Endorsement

To be eligible for an Ohio Educator License, Ohio Administrator License, or Ohio Licensure Endorsement, students must complete the corresponding preparation program and fulfill all requirements of the Ohio Department of Education & Workforce for the license or endorsement they are seeking. Students are responsible for successfully completing all required State of Ohio assessments prior to applying for licensure or endorsement and are responsible for all associated expenses. Scores should be reported to the University of Toledo.

Administrator License or Licensure Endorsement

Candidates for Ohio Administrator License or Ohio Licensure Endorsement must complete field-based experiences in the subject matter and grade band associated with the license or endorsement they are seeking.

Initial Licensure

Candidates for an initial Ohio Educator License must complete practicum experiences and internship in the subject matter and grade band associated with the educator license or endorsement they are seeking. The Office of Field Experiences makes all practicum and internship placements in keeping with the best learning situation for the individual student. Students must be eligible for practicum experiences in PK-12 schools as outlined by the program and the State of Ohio. Students are required to obtain Ohio State Board of Education required permits prior to beginning classroom experiences and are responsible for all associated expenses. Placements are completed with our partner schools, within a 35-mile radius of campus.

Students in an initial licensure program must submit to edTPA and pay all assessments fees. This assessment is submitted during the internship semester. Information about the assessment, passing scores, and options for retaking the edTPA may be found online (https://www.edtpa.com/) and in the Office of Student Services.

PROFESSIONAL ATTENDANCE DURING FIELD EXPERIENCE

Definitions Of Field Experience Types

Practicum. Practicum is a part-time, semester-long experience. Practicum students are expected to be at their field experience school regularly each week, participating consistently with the same students. Internship students will attend on-campus professional development days.

Internship. Internship is a fulltime, semester-long experience. Internship students are expected to be at their field experience school each day school is in session and on teacher workdays. Internship students will follow the field experience school's calendar for the beginning and end of day and school breaks. Internship students will attend on-campus professional development days. Dates are provided to candidates prior to the start of their internship semester.

Field Experience Schedule

Licensure candidates in both Internships and Practicums will submit a Field Experience Schedule to the College's field experience management

system by the end of the first week of the experience. This Field Experience Schedule will list the dates and times the candidate will be in the field experience school for that semester and will include approximate dates for completing activities assigned by the faculty instructor for the co-requisite, on-campus seminar course as coordinated with their mentor teacher. The faculty instructor will verify that the schedule meets requirements for the field experience.

The written Field Experience Schedule will include the following information:

- A copy of the field experience school's calendar with beginning and end of day times and school breaks.
- A calendar listing dates and times the candidate will be in the field experience school.
- Approximate dates for completing assigned activities.

Professional Attendance

Licensure candidates are expected to be present and active at their field experience school according to the Field Experience Schedule agreed upon by their mentor teacher and faculty instructor.

Licensure candidates should report to the main office to sign in and out as required, each day they are in their field experience school. Licensure candidates have the responsibility to learn and follow the field experience school's and their specific classroom's policies and procedures. Licensure candidates should be considerate and professional.

MISSING TIME ON THE FIELD EXPERIENCE SCHEDULE

Licensure candidates may need to miss a planned time in their field experience due to illness or other personal matters that require immediate attention. Licensure candidates must notify their mentor teacher and field supervisor as far in advance as possible if they will be late or absent for a field experience session. If possible, the licensure candidate will provide substitute teaching plans or copies of planned activities for any missed field experience sessions. If completing the requirements of the field experience as outlined in the Field Experience Schedule for the semester is in jeopardy due to attendance, the field supervisor will notify the Office of Field Experiences.

RELIGIOUS ACCOMMODATIONS

Consistent with the University policy on religious accommodations (UToledo policy 3364-71-30.01), licensure candidates may schedule up to three days away from their field experience school. These dates must be indicated on the candidate's Field Experience Schedule submitted at the beginning of the semester. In addition, the candidate should also submit the Religious Accommodations Request Form (https://forms.office.com/r/gBBCQkQj3H/) required by the University.

SUBSTITUTE TEACHING

Opportunities to substitute teach cannot conflict with the licensure candidate's Field Experience Schedule. If the licensure candidate substitute teaches, those events cannot be considered part of the licensure candidate's field experience and will be at the sole discretion of the employing school district.

UNSATISFACTORY PERFORMANCE IN A FIELD EXPERIENCE

Licensure candidates in the Judith Herb College of Arts, Social Sciences, and Education may be determined to have made an unsatisfactory performance in an internship or practicum experience. Reasons for recording an unsatisfactory performance include, but are not limited to, the following:

- Grade of U (unsatisfactory) for the Internship
- Grade of W (withdrawal) for the Internship when concerns regarding performance have been documented.
  - Unprofessional attendance or preparedness.
  - Unprofessional dispositions or behaviors as described in the College's disposition and behavior referral policy.
  - Concerns regarding professional performance *at the level appropriate for the experience* documented by the mentor teacher, field supervisor, or faculty instructor.

Depending on the nature of the concern(s), the student may be removed from the field experience by the Associate Dean before the end of the semester.

Repeating A Field Experience

INTERNSHIP

Internship may be repeated only once. Students who have an unsatisfactory performance must repeat the Internship experience within the next two terms, not including summer.

An Instructional Plan will be developed by the faculty instructor to support the student's success in their second attempt based on goals identified during the student's first attempt. The Instructional Plan will describe learning goals with strategies for meeting the goals and provide guidance regarding a timeline for achieving the goals. The written Instructional Plan will be reviewed and approved by the Associate Dean.

When repeating an internship, a co-requisite, on-campus seminar will also be required but may be completed as pass/fail if a passing grade (C or higher) has already been recorded for the original co-requisite seminar.

Unsatisfactory performance on the second internship experience (or failure to enroll for the second attempt) in any program disqualifies the student from any licensure preparation program in the College.

PRACTICUM

Each practicum may be repeated only once. Students who have an unsatisfactory performance must repeat that practicum experience within the next two terms, not including summer.

An Instructional Plan will be developed by the faculty instructor to support the student's success in their second attempt based on goals identified during the student's first attempt. The Instructional Plan will describe learning goals with strategies for meeting the goals and provide guidance regarding a timeline for achieving the goals. The written Instructional Plan will be reviewed and approved by the Associate Dean.

When repeating a practicum, a co-requisite, on-campus seminar will also be required but may be completed as pass/fail if a passing grade (C or higher) has already been recorded for the original co-requisite seminar.

If the second attempt is satisfactory, the student may continue in the program without prejudice.

Unsatisfactory performance on the second attempt for that practicum experience (or failure to enroll for the second attempt) disqualifies the student from licensure preparation in that program concentration. The student may, however, apply for admission to another licensure program concentration in the College.

Denial Of Opportunity To Repeat A Field Experience

In some cases, the opportunity to repeat the internship or practicum experience may be denied and the student will be disqualified from any licensure preparation program in the College.

Reasons for denying a repeated internship or practicum experience include, but are not limited to the following:

- Performances that place PK-12 students at risk academically, mentally, or physically
- Conduct that is unprofessional as described in the Licensure Code of Professional Conduct for Ohio Educators
- Revocation of pre-service teacher permit or notification of concern from Ohio Department of Education
- Dishonest or unethical actions

Graduate Academic Appeal

Graduate students may appeal an academic decision including an assignment or course grade, an examination or defense result, or other academic decision or action perceived to impede their progress toward completion of the academic program. Appeals dealing with student misconduct or research misconduct are explicitly exempt from this process and shall be dealt with under the relevant University policies and procedures (see UT Policies 3364-30-04 and 3364-70-21).

The student should first verbally discuss the contested grade, result, or program decision with the faculty member involved and make reasonable efforts to resolve the issue. If a verbal attempt to resolve the problem fails or the faculty member is unavailable, the student may initiate the Academic Appeal process outlined below.

Academic appeals must be initiated in writing within 20 working days following the receipt of the contested grade, result, or other academic decision. If the faculty member involved is not available during this time period due to University approved leave of absence or for any other reason, the student will initiate the appeal process described in Step 1 and contact the Department Chair. The Chair will make reasonable efforts to contact the instructor or advisor before proceeding with the appeal process.

No individual may sit in judgement of an appeal or grievance at more than one level of review.

After completing the steps listed below, the Dean's decision may be appealed by either the student or the faculty member to the Dean of the College of Graduate Studies no later than the end of the semester following receipt of the contested grade, action, or decision perceived to impede the student's academic progress. See the Grade Appeal Procedure for Graduate Students or the Graduate Student Academic Grievance Policy (UT Policy 3364-77-02) for the procedures that apply beyond the JHCASE

Note: Working days are Monday through Friday not counting holidays when the university is closed.

Steps of the Academic Appeal Process

1. The student may initiate the appeal process through a written request for reconsideration to the faculty member involved within 20 working days following the receipt of the contested grade, result, or other academic decision. The appeal should include a statement describing the specific grounds for the appeal and suggested resolution.
2. The faculty member must provide a written response to the student within ten (10) working days of receiving the written request for reconsideration.
3. If no mutually agreeable resolution can be achieved, the student may present in writing their position to the Department Chair within ten (10) working days of completing the previous step. Both the student and the faculty member may provide the Chair with relevant information. The appeal should include a statement describing the specific grounds for the appeal and the written explanation of the decision made by the instructor or advisor involved.
4. The Department Chair will attempt to resolve the case by meeting or otherwise communicating with both the student and the faculty member. If a resolution is not achieved, the Department Chair will provide a written determination within ten (10) working days of receiving the written appeal.
5. If the problem is not resolved at the department level, either party may appeal in writing to the Associate Dean who oversees Graduate Education. A written request for a resolution must be made to the Associate Dean within ten (10) working days of the Department Chair's determination. The appeal should include a statement describing the specific grounds for the appeal and the written explanation of the decision made at each level of review.
6. The Associate Dean will attempt to resolve the case by meeting or otherwise communicating with both the student and the faculty member. If a resolution is not achieved, the Associate Dean will call upon the Judith Herb College of Arts, Social Sciences, and Education Student Appeals and Grievance Committee. Any member of the committee directly involved in the disputed academic decision will be excused from reviewing the case. The committee will review all relevant documentation and may interview the student and faculty member involved. The committee will provide a written recommendation to the associate dean within 15 working days of receiving the appeal.
7. Upon receiving the committee's recommendation, the Associate Dean shall make a recommendation to the Dean. The Dean will issue a decision within ten (10) working days of receiving the Committee's recommendation.
8. The Dean's decision may be appealed by either the student or the faculty member to the Dean of the College of Graduate Studies no later than the end of the semester following receipt of the contested grade, action, or decision perceived to impede the student's academic progress. See the COGS Grade Appeal Procedure for Graduate Students or the Graduate Student Academic Grievance Policy (UT Policy3364-77-02) for the procedures that apply beyond the Judith Herb College of Arts Social Sciences and Education.

Departments

- Department of Art (p. 303)
- Department of Economics (p. 303)
- Department of Educational Studies (p. 306)
- Department of English Language and Literature (p. 328)
- Department of Geography and Planning (p. 331)
- Department of History (p. 336)
- Department of Music (p. 338)
- Department of Philosophy and Religious Studies (p. 340)
- Department of Political Science and Public Administration (p. 341)
- Department of Psychology (p. 348)
- Department of Sociology and Anthropology (p. 357)
- Department of Teacher Education (p. 363)
- Department of Women's and Gender Studies (p. 401)
- Department of World Languages and Cultures (p. 401)
- Spatially Integrated Social Science (SISS) (p. 404)

Department of Art

Barbara Miner, Chair
David Guip, Director of Graduate Studies

AED 5000 Research In Art Education
[4 credit hours]
This course will provide an overview of empirical and historical research structures, application of research to classroom activities and development of research for publication.
Term Offered: Spring, Fall

AED 5140 Art Education For The Special Child
[3 credit hours]
This course introduces and surveys a wide variety of art strategies and instructional adaptations for use with the child with physical, emotional or mental differences.
Term Offered: Spring, Fall

AED 5300 Media And Methods In Therapeutic Art
[3 credit hours]
An investigation into group and individual processes as they relate to art media and methods in therapeutic art will be presented. Experiences in art media will be explored.
Prerequisites: AED 5220 with a minimum grade of D-
Term Offered: Spring

AED 5930 Advanced Seminar In Philosophy Of Art Education
[1-4 credit hours]
Guest lecturers from other institutions of higher learning are invited to The Toledo Museum of Art or The University of Toledo Department of Art to present seminars relevant to their endeavors.
Term Offered: Spring, Summer, Fall

AED 5990 Individual Study Of Art For The Graduate Student
[1-4 credit hours]
Individual study is designed to provide a student with the opportunity to work independently on professional problems under the direction of the faculty in the Department of Art.
Term Offered: Spring, Summer, Fall

AED 6920 Masters Research Project In Art Education
[1-4 credit hours]
This course is open to graduate students who elect the completion of a master's project in fulfilling the research requirement of the master's degree program.

AED 6940 Internship
[1-4 credit hours]
This course will incorporate advanced recreational therapy program concepts in therapeutic art within an internship environment using expressive techniques.
Term Offered: Spring, Fall

AED 6960 Master's Research Thesis In Art Education
[1-4 credit hours]
This course is open to graduate students who elect the completion of a master's thesis in fulfilling the research requirement of the master's degree program.
Term Offered: Summer

Department of Economics

Department Chair and Director of Graduate Studies, Aliaksandr Amialchuk

For a full-time student, our M.A. in economics is completed in one year. The degree offers a balanced mix of foundational theory in macro and micro economics with an overall emphasis on applied data analysis skills in the required ECON 5810 Econometrics Models and Methods I and the follow-up course in the spring ECON 5820: Econometrics Models and Methods II and a faculty-advised applied data analysis master's paper, as well as applied data analysis in the spring semester field courses.

Degrees Offered

- M.A. in Economics (p. 305)
  - Economics with an Applied Econometrics Specialization
- Graduate Certificate in Data Analytics in Economics (p. 305)

ECON 5050 Population Economics
[4 credit hours]
Interaction of economic changes and demographic variables; topics include birth rates, women's employment, marriage and divorce, aging and mortality, migration and overpopulation.
Prerequisites: (ECON 1150 (may be taken concurrently) with a minimum grade of D- or ECON 1200 (may be taken concurrently) with a minimum grade of D-) and ECON 2810 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Fall

ECON 5120 Monetary Theory
[4 credit hours]
Modern theories of financial markets, money and the theory of interest rates, money's role in general equilibrium and growth models and money's ability to cause inflation.
Prerequisites: ECON 2120 with a minimum grade of D- or ECON 3120 with a minimum grade of D- or ECON 3150 with a minimum grade of D-
Term Offered: Spring

ECON 5130 Monetary And Fiscal Policy
[3 credit hours]
Changes in the quantity of money and alternative government spending, taxation and debt policies, interrelations of fiscal and monetary policies in stabilization programs.
Prerequisites: ECON 3150 with a minimum grade of D- or ECON 4120 with a minimum grade of D-
Term Offered: Spring

ECON 5150 Advanced Macroeconomic Theory
[4 credit hours]
Theories of consumption and investment. Empirical estimates. Cycle and growth theory, multiplier-accelerator analysis and growth models. The theory and instruments of macroeconomic policy. Dynamic Macroeconomic Theory.
Prerequisites: ECON 3150 with a minimum grade of D-
Term Offered: Fall

ECON 5200 Advanced Microeconomic Theory
[4 credit hours]
Advanced topics in microeconomic theory, consumer behavior, the firm and market structure, distribution theory, equilibrium conditions, welfare economics.
Prerequisites: ECON 3200 with a minimum grade of D-
Term Offered: Fall

ECON 5240 Applied Environmental Economics
[3 credit hours]
The economics of the environment and natural resources using applied welfare theory, benefit-cost analyses, and nonmarket valuation. Examination of economic instruments, such as marketable permits, for solving environmental problems.
Prerequisites: ECON 1200 with a minimum grade of D- or ECON 3240 with a minimum grade of D- or ECON 3270 with a minimum grade of D-
Term Offered: Spring

ECON 5250 Labor Economics
[4 credit hours]
The labor market is studied. Topics include labor force characteristics, wage determination, hours and condition of work, human capital models, unemployment, labor union structure and growth, and modern labor legislation.
Prerequisites: ECON 1200 (may be taken concurrently) with a minimum grade of D- and ECON 2810 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring

ECON 5280 Energy Economics
[4 credit hours]
This course explores the theoretical and empirical perspectives on the demand and supply sides of the energy markets. This course starts with an energy outlook in both domestic and global scales. Then it discusses the natural resource modelling, energy supply, and the behavioral underpinnings of the energy demand. The course continues with current and historical aspects of national and global markets for oil, natural gas, coal, electricity, nuclear power, and renewable energy.
Prerequisites: ECON 1150 with a minimum grade of D- or ECON 1200 with a minimum grade of D-

ECON 5300 Mathematical Economics
[3 credit hours]
Development and applications of the mathematical tools used by economists. Differential and integral calculus, linear algebra, transcendental functions and series.
Prerequisites: ECON 1150 with a minimum grade of D- or ECON 1200 with a minimum grade of D-
Term Offered: Spring, Fall

ECON 5410 American Economic History
[3 credit hours]
Exploration of economic growth in America from pre-Columbian times to the present day. Analysis of economic institutions, technological change, industrialization and standards of living.
Prerequisites: ECON 1150 with a minimum grade of D- or ECON 1200 with a minimum grade of D- or ECON 1880 with a minimum grade of D-

ECON 5510 International Economics I
[4 credit hours]
Theory of international trade; commercial policy; costs and benefits, economic integration; trade and economic growth and balance of payments problems.
Prerequisites: ECON 1150 with a minimum grade of D-
Term Offered: Spring

ECON 5620 Regional Economics
[3 credit hours]
Examination of regional income estimates and social accounts, regional multipliers, diverse location theories, supplemented with techniques of regional analysis.
Prerequisites: ECON 1200 with a minimum grade of D-

ECON 5660 Public Finance Economics
[4 credit hours]
An analysis of the government sector in the economy, government expenditures, taxation and borrowing and their effects on employment, price levels and growth.
Prerequisites: ECON 1200 with a minimum grade of D-
Term Offered: Spring

ECON 5750 Health Economics
[3 credit hours]
Economic analysis of health and health services. Topics currently include medical and allied manpower, hospitals, drugs and cost-benefit analysis of selected health programs.
Prerequisites: ECON 1200 (may be taken concurrently) with a minimum grade of D- and ECON 2810 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Fall

ECON 5810 Econometrics Models And Methods I
[4 credit hours]
An introduction to econometric methods and their use in quantitative analysis of economic theories. Diagnostics for problems typically encountered are detailed along with techniques for correcting these problems.
Prerequisites: MATH 2600 with a minimum grade of D- or ECON 2810 with a minimum grade of D- or PSY 2100 with a minimum grade of D- or SOC 3290 with a minimum grade of D- or GEPL 4420 with a minimum grade of D-
Term Offered: Fall

ECON 5820 Econometrics Models And Methods II
[4 credit hours]
An introduction to forecasting methods for economic time-series including Bayesian methods. Both theory and application of forecasting models and methods are covered.
Prerequisites: ECON 5810 with a minimum grade of D-
Term Offered: Spring

ECON 5830 Econometrics Models And Methods III
[3 credit hours]
Econometric methods that apply to survey, spatial and cross-sectional/ time-series data along with other specialized modeling techniques are covered.
Prerequisites: ECON 5810 with a minimum grade of D-
Term Offered: Spring, Fall

ECON 6260 Behavioral Economics
[4 credit hours]
Economic analysis of decisions made by people. Topics include decision-making under risk and uncertainty, strategic decision-making, and experimental economics.
Prerequisites: ECON 1200 (may be taken concurrently) with a minimum grade of D- and ECON 2810 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring

ECON 6810 Seminar in Applied Econometrics I
[2 credit hours]

ECON 6820 Seminar in Applied Econometrics II
[2 credit hours]

ECON 6830 Seminar in Applied Econometrics III
[2 credit hours]

ECON 6900 Graduate Research
[1-7 credit hours]

ECON 6950 Capstone Project
[0 credit hours]
Demonstration of applied economic analysis through a Master's paper or equivalent.
Term Offered: Spring, Summer, Fall

ECON 6960 Thesis
[1-8 credit hours]

ECON 6990 Graduate Readings
[1-7 credit hours]

Graduate Certificate in Data Analytics in Economics

The data analytics in economics MA certificate will provide any graduate student the foundational social science data analysis skills employers desire. Methods covered will include causal inference and forecasting, as well as complementary programming skills to collect, prepare, and analyze data sets. To learn more please speak with Dr. Oleg Smirnov, graduate director, department of economics.

"Data Analytics in Economics" graduate certificate. The proposed certificate requires the student to complete three courses and an applied data analysis Master's paper:

Code	Title	Hours
ECON 5810	Econometrics Models And Methods I	4
ECON 5820	Econometrics Models And Methods II	4
ECON 5000 level elective course that includes a required data analysis component (4 credits) or suitable substitution of one of the above courses with permission of the economics graduate director.		4
Completed Master's paper (or Master's thesis) that includes a required data analysis component (minimum of a zero credit course with assigned research advisor).		

The department of economics currently teaches two sequenced graduate data analysis courses every year, one in the fall semester, ECON 5810: Econometrics Models and Methods I (4 credits) and one in the spring semester, ECON 5820: Econometrics Models and Methods II (4 credits). These courses are foundational for understanding causal inference for applied data analysis. Once the students have these two courses to build their data analysis toolbox, they apply the toolbox to a graduate economics course, or any graduate course, that requires an empirical component. If the course is 3 credits, then the student must register for a one hour independent study with the course instructor to demonstrate their applied data analysis skills in the course. Otherwise, the course is a 4 credit course with the data analysis component as imbedded in the course. Lastly, for a graduate student to complete the Data Analytics in Economics graduate certificate they must complete a Master's paper or Master's thesis (in economics or other) further demonstrating their data analysis application skills.

- PLO 1. Formalize a research question that can be studied with empirical data,
- PLO 2. collect and prepare data for analysis,
- PLO 3. choose and apply the appropriate empirical method for the data and research question of interest,
- PLO 4. explain and communicate the empirical results in writing and verbally.

M.A. in Economics

EARLY ADMISSION TO MASTER'S DEGREE PROGRAM IN ECONOMICS

A special opportunity exists for undergraduate students at the University of Toledo interested in pursuing a Master's of Arts Degree in Economics. Being evaluated by the same criteria as graduate students, undergraduate students have the opportunity to apply advanced-level work to their undergraduate degree requirements while, at the same time, securing a significant "head start" toward satisfying the requirements for a master's degree in Economics. Qualifying undergraduate students are allowed to apply particular courses (and associated credit hours) towards **both** their undergraduate and graduate degree requirements.

If accepted into this program undergraduate students may register for up to 3 graduate-level Economics courses (9 credit hours). Because the M.A. degree in Economics requires 30 credit hours of graduate-level work, students who complete 8 of those hours as an undergraduate student have to complete only 22 additional credit hours as a graduate student to receive their master's degree.

Undergraduate students with a declared major or minor in Economics and a cumulative GPA in Economics courses of 3.3 or higher are

eligible for this program. Students accepted into this program must consult and receive prior approval from the Department of Economics' graduate director as to which courses at the University of Toledo may be applied for dual credit toward both undergraduate and graduate degree requirements. Students interested in this program are encouraged to speak with the Department of Economics' Chair, graduate director, or undergraduate advisor for additional information and the application form for this program.

REQUIREMENTS FOR THE MASTER'S PROGRAM

The economics department offers the Master of Arts in Economics degree, the Master of Arts in Economics degree with an applied econometrics specialization, and the Master of Arts in Economics and Education degree. In all cases, students must complete a minimum of 30 hours of graduate work that includes the following:

1. At least one course from each of two different fields, in addition to the following basic theory requirements (or their equivalents):

Code	Title	Hours
ECON 5150	Advanced Macroeconomic Theory	4
ECON 5200	Advanced Microeconomic Theory	4
ECON 5300	Mathematical Economics	3
ECON 5810	Econometrics Models And Methods I	4

The graduate director may waive the ECON 5300 requirement for students who have an adequate background in mathematics.

2. Any courses taken at the graduate level outside of the department of economics must be approved by the graduate director.

3. Credits in excess of seven hours in economics courses numbered 6000 through 6990 will not ordinarily be applicable to the 30 hours.

4. Candidates for either degree are required to pass a comprehensive written examination in macroeconomics and microeconomics. In addition, the department may require an oral examination.

5. In addition to the 30 hours of course work, candidates must satisfy a writing requirement of either a thesis or a capstone project.

A candidate who elects the thesis option must submit a thesis for review by a committee of at least three faculty members and satisfy College of Graduate Studies thesis requirements. Such a candidate may receive a maximum of seven credit hours following the successful defense of that thesis. A candidate who elects the non-thesis option must submit a capstone project, or its equivalent, for review by at least two faculty members. No credit hours will be earned for the capstone project.

Applied Econometrics Specialization

1. **Completion of the M.A. in Economics requirements**
2. **Internships**

The department offers a public service internship, requiring seven credit hours of internship. In addition, the intern is allowed to include up to three credit hours of either ECON 6900 or ECON 6990 toward the 30 credit hours required for a Master of Arts degree.

EARLY ADMISSION TO MASTER'S DEGREE PROGRAM IN ECONOMICS

A special opportunity exists for Economics, B.A. undergraduate students at the University of Toledo interested in pursuing a Master's of Arts Degree in Economics. Being evaluated by the same criteria as graduate students, undergraduate students have the opportunity to apply advanced-level work to their undergraduate degree requirements while, at the same time, securing a significant "head start" toward satisfying the requirements for a master's degree in Economics. Qualifying undergraduate students are allowed to apply particular courses (and associated credit hours) towards **both** their undergraduate and graduate degree requirements.

If accepted into this program undergraduate students may register for up to 3 graduate-level Economics courses (9 credit hours). Because the M.A. degree in Economics requires 30 credit hours of graduate-level work, students who complete 8 of those hours as an undergraduate student have to complete only 22 additional credit hours as a graduate student to receive their master's degree.

Undergraduate students with a declared major or minor in Economics and a cumulative GPA in Economics courses of 3.3 or higher are eligible for this program. Students accepted into this program must consult and receive prior approval from the Department of Economics' graduate director as to which courses at the University of Toledo may be applied for dual credit toward both undergraduate and graduate degree requirements. Students interested in this program are encouraged to speak with the Department of Economics' Chair, graduate director, or undergraduate advisor for additional information and the application form for this program.

- PLO 1: Students will demonstrate an understanding of economic theory via the use of analytical and quantitative tools, such as calculus and econometric techniques.
- PLO 2: Students will be able to derive demand functions by considering a constrained maximization model of utility-maximizing behavior coupled with a description of the underlying economic constraints. Using these demand functions, students will be able to show how consumers' demand changes as prices and income changes.
- PLO 3: Students will be able to derive supply functions by considering an unconstrained maximization model of profit maximizing behavior. Students will be able to modify this model depending on whether firms are operating in competitive or non-competitive industries.
- PLO 4: Students will be able to build a macroeconomic model and analyze business cycles, inflation, unemployment, and interest rates. They will be able to analyze policy options and to examine the costs and benefits of the use of monetary and fiscal policy decisions.
- PLO 5: Students will be able to analyze the causes of economic growth in an economic model and examine how short-run policy choices impact long run economic growth.
- PLO 6: Students will be able to discuss economic data.
- PLO 7: Students demonstrate their ability to analyze data and their ability at employing econometric techniques.

Department of Educational Studies

Snejana Slantcheva-Durst, chair

The mission of the department of educational studies is to prepare and develop educational leaders and scholars to be agents of transformation on all levels of educational systems. Our graduate programs are geared towards working professionals: they are student-centered, inquiry-based, and praxis-oriented (integrating theory and practice). The department offers master's and doctoral degrees in educational administration and supervision, educational psychology, higher education, research and measurement, and social foundations of education.

The department is also the home of the Center for Education in Targeted Violence and Suicide and the Center for Nonviolence and Democratic Education.

Accreditation

The Education programs in the Judith Herb College of Arts, Social Sciences, and Education are fully accredited by the Council for Accreditation of Educator Preparation (CAEP). This accreditation status is effective between fall 2023 and fall of 2030. The next on-site visit will take place in spring 2030. Additionally, all licensure programs are approved by the Ohio Department of Higher Education.

Master's Degrees

Master of Education in Educational Administration and Supervision (p. 320)

Master of Education in Educational Theory and Social Foundations (p. 321)

Master of Education in Higher Education (p. 323)

Doctoral Degrees

Doctor of Philosophy in Foundations of Education (p. 324)

- Concentrations in Educational Psychology or Foundations of Education

Doctor of Philosophy in Higher Education (p. 327)

Graduate Certificates

Certificate in Peace and Justice Studies (https://catalog.utoledo.edu/graduate/arts-social-sciences-education/departments/educational-studies/peace-and-justice-studies-certificate/)

Certificate in Higher Education Administration (p. 318)

Certificate for Principal Licensure (p. 319)

Courses

EDAS 6000 The Individual In Organizations
[3 credit hours]
An overview of the individual in educational administration, i.e., as visionary leader, organizational leader, instructional leader and policy/community leader. Opportunities for personal assessment are provided as students explore critical educational issues in schools.
Term Offered: Spring, Summer, Fall

EDAS 6010 Leadership in School Curriculum
[3 credit hours]
An in-depth analysis of curriculum leadership to improve teacher classroom performance and to ensure that the district curriculum and instructional programs are aligned and operationalized to provide full access and opportunity to all students and student groups to meet district goals.
Term Offered: Spring, Fall

EDAS 6020 Instructional Leadership and Supervision
[3 credit hours]
An in-depth analysis of instructional leadership and principles of supervision which promote improved instruction. Emphasis is on teacher performance evaluation, curriculum management and strategies for creating a philosophical shift from a special education/regular education dichotomy to a universal education paradigm.
Term Offered: Spring, Fall

EDAS 6110 Legal Aspects Of School Administration
[3 credit hours]
This course provides students an opportunity to analyze legal frameworks affecting the organization and administration of public schools, including special education law, church-state issues, pupil rights, staff-student relationships, conditions of employment, teacher organizations, tort liability, school finance, and desegregation. Participants will examine the basic legal structure for education, case and statutory law, legal principles, and provisions relevant to administration.
Term Offered: Spring, Summer, Fall

EDAS 6150 Data Driven Leadership: A Hands On Approach
[3 credit hours]
Students will critically examine the intersection of current leadership theories with the principles of computational thinking. The course focuses on the most critical responsibilities of building principals in creating and managing high achieving and high functioning schools. The emphasis will be on the practical, “hands-on” skill building administrators need in order to effectively lead and manage schools. A primary focus will be on developing an understanding of how leaders use data to improve schools to move the organization forward. In addition, this course emphasizes building a tech-forward vision for school leadership that aligns with future workforce demands, fostering a school culture where digital literacy and problem-solving are integral to the learning process.
Term Offered: Spring

EDAS 6190 Integrated Experiences: Prac i
[3 credit hours]
Working in a guided reflective practice environment, the student will apply knowledge gained in previous coursework to working in school building operations, and to developing a professional portofolio.
Term Offered: Spring, Fall

EDAS 6230 Community And Schools
[3 credit hours]
This course explores the unique relationship between communities and schools. The democratic social structure is examined through a theoretical critique of strategies that increase citizen involvement in and build support for schools.
Term Offered: Spring, Summer, Fall

EDAS 6440 Equity Issues In Educational Finance And Economics
[3 credit hours]
Analysis of educational finance and economic issues pertinent to school districts. Analysis of various funding models at the local, state and national level are studied employing various measures of equity. Building/District level school finance and resource management strategies are examined.
Term Offered: Spring, Summer, Fall

EDAS 6920 Master's Project In Educational Administration
[1-3 credit hours]
Open to graduate students who elect the completion of a research project in fulfilling the research requirements of the master's program.
Term Offered: Spring, Summer, Fall

EDAS 6960 Master's Thesis In Educational Administration
[1-3 credit hours]
Open to graduate students who elect the completion of a research thesis in fulfilling the research requirements of the master's program.
Term Offered: Spring, Summer, Fall

EDAS 6990 Individual Study In Educational Administration - Master's
[1-3 credit hours]
Open to graduate students who wish to pursue individual study on professional problems in EDAS under the direction of an EDAS faculty member.
Term Offered: Spring, Summer

EDAS 7920 Specialist Project In Educational Administration
[1-3 credit hours]
Open to graduate students to fulfill the completion of a research project in fulfilling the research requirements of the specialist program.
Term Offered: Spring, Summer, Fall

EDAS 7990 Independent Study In Education Administration
[1-3 credit hours]
Individual study on professional problems in EDAS under the direction of a EDAS faculty member.
Term Offered: Spring, Summer, Fall

EDAS 8000 The Individual In Organizations
[3 credit hours]
An overview of the individual in educational administration, i.e., as visionary leader, organizational leader, instructional leader and policy/community leader. Opportunities for personal assessment are provided as students explore critical educational issues in schools.
Term Offered: Spring, Summer, Fall

EDAS 8010 Leadership in School Curriculum
[3 credit hours]
An in-depth analysis of curriculum leadership to improve teacher classroom performance and to ensure that the district curriculum and instructional programs are aligned and operationalized to provide full access and opportunity to all students and student groups to meet district goals.
Term Offered: Spring, Fall

EDAS 8020 Instructional Leadership and Supervision
[3 credit hours]
An in-depth analysis of instructional leadership and principles of supervision which promote improved instruction. Emphasis is on teacher performance evaluation, curriculum management and strategies for creating a philosophical shift from a special education/regular education dichotomy to a universal education paradigm.
Term Offered: Spring, Fall

EDAS 8110 Legal Aspects Of School Administration
[3 credit hours]
This course provides students an opportunity to analyze legal frameworks affecting the organization and administration of public schools, including special education law, church-state issues, pupil rights, staff-student relationships, conditions of employment, teacher organizations, tort liability, school finance, and desegregation. Participants will examine the basic legal structure for education, case and statutory law, legal principles, and provisions relevant to administration.
Term Offered: Spring, Summer, Fall

EDAS 8150 Data Driven Leadership: A Hands On Approach
[3 credit hours]
Students will critically examine the intersection of current leadership theories with the principles of computational thinking. The course focuses on the most critical responsibilities of building principals in creating and managing high achieving and high functioning schools. The emphasis will be on the practical, "hands-on" skill building administrators need in order to effectively lead and manage schools. A primary focus will be on developing an understanding of how leaders use data to improve schools to move the organization forward. In addition, this course emphasizes building a tech-forward vision for school leadership that aligns with future workforce demands, fostering a school culture where digital literacy and problem-solving are integral to the learning process.
Term Offered: Spring

EDAS 8190 Integrated Experiences In Education Administration
[3 credit hours]
Working in a guided reflective practice environment, the student will apply knowledge gained in previous coursework to working in school building operations.
Term Offered: Spring, Fall

EDAS 8230 Community And Schools
[3 credit hours]
This course explores the unique relationship between communities and schools. The democratic social structure is examined through a theoretical critique of strategies that increase citizen involvement in and build support for schools.
Term Offered: Spring, Summer, Fall

EDAS 8300 Integrate Experiences: Policies In Action
[3 credit hours]
This course analyses policies employed by schools and school districts in providing for education of students and services to the school community. On-site fieldwork is required.
Term Offered: Spring, Fall

EDAS 8420 Micropolitics Of School Communities
[3 credit hours]
Course focus is on the day to day politics of school work that increase the complexities of educating. Using case studies and problem-based learning, students will practice skills that support democratic practices in school communities.
Term Offered: Spring, Fall

EDAS 8440 Equity Issues In Educational Finance And Economics
[3 credit hours]
Analysis of educational finance and economic issues pertinent to school districts. Analysis of various funding models at the local, state and national level are studied employing various measures of equity. Building/ District level school finance and resource management strategies are examined.
Term Offered: Spring, Summer, Fall

EDAS 8600 Leadership And Organizational Theory
[3 credit hours]
An analysis of leadership and organizational theory as influences on current thinking about and approaches to educational administration. Emphasis is on understanding dominant themes that impact administrative theory.
Term Offered: Fall

EDAS 8640 Leading Systems Change
[3 credit hours]
Course explores processes and practices used by educators to redesign preK-12 educational systems to improve outcomes for students. Content examines processes of moving espoused organizational values to actionable knowledge. Organizational Development recommended.
Term Offered: Spring, Fall

EDAS 8660 Critical Analysis Of Inquiry In Schools
[3 credit hours]
Concepts in understanding and evaluating contemporary educational research, addressing both quantitative and qualitative research methods. The focus is on the knowledge base school leaders must have to evaluate, use and initiate educational research in school settings.
Term Offered: Spring, Fall

EDAS 8930 Doctoral Seminar In Educational Administration And Supervision
[3 credit hours]
The course examines research findings and research methodology in Educational Administration and Supervision as they are pertinent to development of dissertation proposals. Dissertation proposal development is encouraged.
Term Offered: Spring, Fall

EDAS 8960 Doctoral Dissertation In Educational Administration And Supervision
[1-12 credit hours]
Production of an original, scholarly product in the area Educational Administration and Supervision. Dissertation credit may total not less than 12 semester hours.
Term Offered: Spring, Summer, Fall

EDP 5110 Advanced Educational Psychology
[3 credit hours]
A graduate level introduction to the field of educational psychology. Instruction will cover fundamentals of learning, motivation, cognition, individual differences and instructional applications as well as a research-oriented approach to answering scientific questions.
Term Offered: Spring, Summer, Fall

EDP 5220 Adolescent Behavior And Development
[3 credit hours]
Current theory and research on physical, cognitive, social, emotional and personality development are examined and used as the basis for identifying and solving problems related to adolescent growth and development.
Term Offered: Spring, Summer, Fall

EDP 5250 Addressing Student and Educator Mental Health
[3 credit hours]
This course explores the intersection of mental health within educational environments, focusing on the mental well-being of both students and educators. Through an interdisciplinary approach, students will examine the unique stressors and challenges faced by individuals in academic settings, including anxiety, depression, burnout, and trauma. The course will cover the impact of these mental health issues on learning, teaching, and overall educational outcomes.
Term Offered: Spring, Fall

EDP 5310 Issues And Innovations In Learning And Instruction
[3 credit hours]
Reviews emergent theory, principles and research findings on cognition and learning and applies these concepts to developing instructional experiences and conditions for optimizing classroom learning and performance.
Term Offered: Spring, Fall

EDP 5320 Instructional Psychology
[3 credit hours]
Theory and research in psychology that contributes to effective instruction. Topics include varieties and conditions of learning, information processing, learning analysis, constructivism, mastery learning, cooperative learning, norm & criterion-referenced measurement.
Term Offered: Spring

EDP 5340 Classroom Engagement and Behavioral Supports
[3 credit hours]
The course builds teacher candidate's knowledge of social and emotional development and needs for children. Teacher candidates develop skills to develop support positive classroom dynamics, prosocial behaviors and classroom management. The course addresses theory and practical application of current behavioral support approaches as well as the evolution of the field across time. Special attention will be paid to current best practice as it applies to the early childhood classroom.
Term Offered: Spring, Summer, Fall

EDP 5950 Workshop In Educational Psychology
[3 credit hours]
Each workshop is developed around a topic of interest and concern to in-service teachers and other educational personnel. Practical application of workshop topics will be emphasized.
Term Offered: Summer, Fall

EDP 6120 School Violence Theory, Prevention, and Intervention
[3 credit hours]
The seminar focuses on the assessment, management, and prevention of school violence. The role of nature and nurture will be explored, as will society's role (e.g., teachers, school administrators) in assessment, prevention and intervention. The forms of violence to be addressed are child abuse, gang activity, bullying, harassment, and targeted violence.
Term Offered: Spring, Summer, Fall

EDP 6140 Motivation Theory And Application
[3 credit hours]
Graduate-level study of conceptions of motivation in various settings. Emphasis is on understanding major concepts and principles, as well on application to such settings as classroom, counseling and industry.
Prerequisites: EDP 5110 with a minimum grade of D- or EDP 5210 with a minimum grade of D- or EDP 5220 with a minimum grade of D- or EDP 5230 with a minimum grade of D- or EDP 7110 with a minimum grade of D- or EDP 7230 with a minimum grade of D-
Term Offered: Spring

EDP 6150 CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT
[3 credit hours]
This course aims to develop a broader understanding of the role of culture in psychological processes and the implications of such psychological understanding for a culturally diverse society.
Term Offered: Spring, Fall

EDP 6160 Self and Identity
[3 credit hours]
The Self and Identity course examines the content, structure, organization of self, self-processes, both implicit and explicit, involving cognition, evaluation, motivation, and emotional dimensions of the development of selfhood. The course also examines the meaning of personal and interpersonal identities including cultural, ethnic, and gender identity and the role of context in shaping these multiple identities. The implications of the readings for educators.
Prerequisites: EDP 5110 with a minimum grade of C or EDP 5120 with a minimum grade of C or EDP 5220 with a minimum grade of C or EDP 5230 with a minimum grade of C or PSY 4500 with a minimum grade of C or PSY 4700 with a minimum grade of C

EDP 6190 Seminar In Educational Psychology
[3 credit hours]
The collaborative study of a specific topic in educational psychology by a group of advanced students under the direction of one or more professors.
Term Offered: Spring, Summer, Fall

EDP 6250 Social Development
[3 credit hours]
Critical examination of theory and research on social behaviors such as attachment, aggression and prosocial behavior, including their causes, how they affect the person and how they change with age.
Prerequisites: EDP 5210 with a minimum grade of D- or EDP 5220 with a minimum grade of D-
Term Offered: Spring, Fall

EDP 6270 Parenting: Theory And Research
[3 credit hours]
Analysis and evaluation of the research on parenting across a variety of sociocultural contexts.
Prerequisites: EDP 5320 with a minimum grade of D-

EDP 6340 Theories Of Learning
[3 credit hours]
Intensive inquiry into the study of learning with particular emphasis on more recent theories. Theory application in a wide variety of settings will also be stressed.

EDP 6370 News Media Literacy, Society, and the Mind
[3 credit hours]
The course provides students with a theoretical and empirical foundation on psychological concepts and processes (e.g., critical thinking, personal epistemology, and belief systems), to understand the role of the news media (e.g., news print/broadcast, social media, and media technology) for the public sphere, citizenship, democracy, and peace. In their area of studies, students will learn how to develop a competency based news media literacy model that enables citizens to be/come critical and effective news media consumers.

EDP 6380 Prevention Through Postvention in Targeted Violence Terrorism and Suicide
[3 credit hours]
This course provides information on key aspects of prevention, intervention, active response, and postvention applied to incidents of targeted violence such as campus shootings, terrorism, and suicide. The content is based on government reports, journal articles, and post incident analyses. Emphasis is placed on practical application of the course content. The course is relevant to those pursuing degrees in educational psychology, psychology, counselor education, educational administration, higher education, criminal justice and related fields.

EDP 6960 Master's Thesis In Educational Psychology
[1-3 credit hours]
A formal, independent study culminating in a written discourse that advances our understanding of educational psychology.
Term Offered: Spring, Summer, Fall

EDP 6980 Master's Project In Educational Psychology
[1-3 credit hours]
A formal, independent project applying principles of educational psychology to solve a particular problem and culminating in a written discourse.
Term Offered: Spring, Summer, Fall

EDP 6990 Independent Study In Educational Psychology
[1-3 credit hours]
Directed study of a current topic in educational psychology. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Fall

EDP 7110 Advanced Educational Psychology
[3 credit hours]
A graduate level introduction to the field of educational psychology. Instruction will cover fundamentals of learning, motivation, cognition, individual differences and instructional applications as well as a research-oriented approach to answering scientific questions.
Term Offered: Spring, Summer, Fall

EDP 7250 Addressing Student and Educator Mental Health
[3 credit hours]
This course explores the intersection of mental health within educational environments, focusing on the mental well-being of both students and educators. Through an interdisciplinary approach, students will examine the unique stressors and challenges faced by individuals in academic settings, including anxiety, depression, burnout, and trauma. The course will cover the impact of these mental health issues on learning, teaching, and overall educational outcomes.
Term Offered: Spring, Fall

EDP 7310 Issues And Innovations In Learning And Instruction
[3 credit hours]
Reviews emergent theory, principles and research findings on cognition and learning and applies these concepts to developing instructional experiences and conditions for optimizing classroom learning and performance.
Term Offered: Spring, Fall

EDP 7950 Workshop In Educational Psychology
[3 credit hours]
Each workshop is developed around a topic of interest and concern to in-service teachers and other educational personnel. Practical application of workshop topics will be emphasized.
Term Offered: Summer, Fall

EDP 8120 School Violence Theory, Prevention, and Intervention
[3 credit hours]
The seminar focuses on the assessment, management, and prevention of school violence. The role of nature and nurture will be explored, as will society's role (e.g., teachers, school administrators) in assessment, prevention and intervention. The forms of violence to be addressed are child abuse, gang activity, bullying, harassment, and targeted violence.
Term Offered: Spring, Summer, Fall

EDP 8140 Motivation Theory And Application
[3 credit hours]
Graduate-level study of conceptions of motivation in various settings. Emphasis is on understanding major concepts and principles, as well on application to such settings as classroom, counseling and industry.
Prerequisites: EDP 5110 with a minimum grade of D- or EDP 5210 with a minimum grade of D- or EDP 5220 with a minimum grade of D- or EDP 5230 with a minimum grade of D- or EDP 7110 with a minimum grade of D- or EDP 7230 with a minimum grade of D-
Term Offered: Spring

EDP 8150 CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT
[3 credit hours]
This course aims to develop a broader understanding of the role of culture in psychological processes and the implications of such psychological understanding for a culturally diverse society.
Term Offered: Spring, Fall

EDP 8160 Self and Identity
[3 credit hours]
The Self and Identity course examines the content, structure, organization of self, self-processes, both implicit and explicit, involving cognition, evaluation, motivation, and emotional dimensions of the development of selfhood. The course also examines the meaning of personal and interpersonal identities including cultural, ethnic, and gender identity and the role of context in shaping these multiple identities. The implications of the readings for educators.
Prerequisites: EDP 5110 with a minimum grade of C or EDP 5120 with a minimum grade of C or EDP 5220 with a minimum grade of C or EDP 5230 with a minimum grade of C or PSY 4500 with a minimum grade of C or PSY 4700 with a minimum grade of C

EDP 8190 Seminar In Educational Psychology
[3 credit hours]
The collaborative study of a specific topic in educational psychology by a group of advanced students under the direction of one or more professors.
Term Offered: Spring, Summer, Fall

EDP 8250 Social Development
[3 credit hours]
Critical examination of theory and research on social behaviors such as attachment, aggression and prosocial behavior, including their causes, how they affect the person and how they change with age.
Prerequisites: EDP 5210 with a minimum grade of D- or EDP 5220 with a minimum grade of D-
Term Offered: Spring, Fall

EDP 8270 Parenting: Theory And Research
[3 credit hours]
Analysis and evaluation of the research on parenting across a variety of sociocultural contexts.

EDP 8340 Theories Of Learning
[3 credit hours]
Intensive inquiry into the study of learning with particular emphasis on more recent theories. Theory application in a wide variety of settings will also be stressed.

EDP 8370 News Media Literacy, Society, and the Mind
[3 credit hours]
The course provides students with a theoretical and empirical foundation on psychological concepts and processes (e.g., critical thinking, personal epistemology, and belief systems), to understand the role of the news media (e.g., news print/broadcast, social media, and media technology) for the public sphere, citizenship, democracy, and peace. In their area of studies, students will learn how to develop a competency based news media literacy model that enables citizens to be/come critical and effective news media consumers.

EDP 8380 Prevention through Postvention of Targeted Violence, Terrorism and Suicide
[3 credit hours]
This course provides information on key aspects of prevention, intervention, active response, and postvention applied to incidents of targeted violence such as campus shootings, terrorism, and suicide. The content is based on government reports, journal articles, and post incident analyses. Emphasis is placed on practical application of the course content. The course is relevant to those pursuing degrees in educational psychology, psychology, counselor education, educational administration, higher education, criminal justice, and related fields.

EDP 8960 Dissertation Research In Educational Psychology
[1-12 credit hours]
A formal, independent study culminating in a written discourse that advances our understanding of educational psychology.
Term Offered: Spring, Summer, Fall

EDP 8990 Independent Study In Educational Psychology
[1-6 credit hours]
Directed study of a current topic in educational psychology. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Summer, Fall

EDU 7000 Introduction to Doctoral Studies
[3 credit hours]
This course introduces doctoral students to doctoral studies, research, the dissertation project, professional development, and the theoretical roots of their interdisciplinary educational fields.
Term Offered: Fall

EDU 7100 Quantitative Research Foundations: Concepts and Practice
[3 credit hours]
This course introduces the major concepts of quantitative description, including central tendency, dispersion, and relative position and relationship. Inferential methods such as t tests, analysis of variance, and correlation are also presented along with an introduction to conceptions of measurement and research design.
Prerequisites: EDU 7000 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Fall

EDU 7200 Foundations of Qualitative Research
[3 credit hours]
This course provides students with foundational knowledge in qualitative research in educational contexts: domains of knowledge, theory in research, research question development, and methods of inquiry.
Prerequisites: EDU 7000 with a minimum grade of C
Term Offered: Spring, Summer, Fall

EDU 7300 Foundations of Theory
[3 credit hours]
This course provides students with foundational knowledge of theoretical orientations to empirical and normative theory to inform the design and implementation of social science and educational research. The purpose of this course is to explore prominent theoretical orientations to empirical and normative research and scholarship.
Prerequisites: EDU 7000 with a minimum grade of C
Term Offered: Spring, Summer, Fall

EDU 8100 Literacy in Advanced Quantitative Methods
[3 credit hours]
This course examines advanced quantitative research designs, statistical modeling frameworks, and measurement approaches commonly used in educational and social science research. Emphasis is placed on aligning research questions with appropriate designs and analytic strategies, including regression-based models, multilevel and hierarchical approaches, and psychometric and latent variable methods. The course prioritizes conceptual understanding, model interpretation, and analytic decision-making across a wide range of quantitative research contexts.
Prerequisites: EDU 7100 with a minimum grade of C
Term Offered: Spring, Fall

EDU 8400 Advanced Seminar in Research
[3 credit hours]
This doctoral-level seminar uses a studio-based model to support students in developing, piloting, and refining advanced research skills. Through hands-on practice, instructor and peer feedback, and iterative refinement of qualitative, quantitative, or mixed methods, students propose or informally propose and present a preliminary research plan addressing an important research problem. Emphasis is placed on refining methodological thinking, applying a specific research approach, and articulating and defending methodological decisions in preparation for dissertation research.
Prerequisites: EDU 7100 with a minimum grade of C and EDU 7200 with a minimum grade of C and EDU 7300 with a minimum grade of C
Term Offered: Spring, Fall

HED 5900 Diversity Leadership in Higher Education
[3 credit hours]
Diversity Leadership in Higher Education explores issues of diversity on campuses through foundational and contemporary lenses. It is intended for students studying higher education as a major or area of research interest, as well as employees in institutions of higher education at all levels. The course defines diversity in higher education settings and explores diversity through student, faculty, and administrative lenses, including the components of an effective diversity office on campus.
Term Offered: Spring, Summer, Fall

HED 5980 Special Topics In Higher Education
[1-3 credit hours]
This seminar provides advanced study in special topics of interest to faculty and administrators in higher education.
Term Offered: Summer, Fall

HED 6010 History Of Higher Education
[3 credit hours]
Introduction to the historical development of American higher education from colonial times to the 20th century. Emphasis on the major historical events that contributed to the diversity of higher education.
Term Offered: Summer, Fall

HED 6120 International Education
[3 credit hours]
Complex interrelationships between global and educational systems will be examined. Emphasis will be on how education can be used to build a more global society. Some sections will include an international field study trip.
Term Offered: Spring, Summer, Fall

HED 6510 The American College Student
[3 credit hours]
This course explores the character and nature of student populations in contemporary American colleges and universities and considers the impact of campus environments and experiences on development, interaction and learning.
Term Offered: Spring, Fall

HED 6530 Theories Of Student Development
[3 credit hours]
Students critically examine traditional and contemporary theories of college student development, identify methods of assessing that development, and explore ways to apply the theories to everyday practice.
Term Offered: Spring, Summer, Fall

HED 6570 Research in Higher Education
[3 credit hours]
The course introduces students to research methods and techniques, along with the resources available, both within the University and nationally, for the purpose of higher education research. Introductory qualitative and quantitative research concepts are covered, as well as how to critique research articles in the field of higher education.
Term Offered: Spring, Summer, Fall

HED 6640 Governance And Administration In Higher Education
[3 credit hours]
This course introduces students to the theories and structures of the governance and administration of academic organizations, and to the sources of authority and decision-making in academic institutions.
Term Offered: Spring, Fall

HED 6700 Finance Of Higher Education
[3 credit hours]
This course discusses issues related to the expenditure of funds for higher education within institutions and systems. issues addressed include capital funding, endowment management and budget preparation.
Term Offered: Spring, Summer, Fall

HED 6730 Legal Aspects Of Higher Education
[3 credit hours]
Law, its history, philosophy and practical application to and effect on the creation and administration of public and private higher education is examined in the context of court decisions.
Term Offered: Spring, Fall

HED 6770 Evaluation And Outcomes Assessment In Higher Education
[3 credit hours]
This course focuses on outcomes-based assessment of learning and development in student affairs.
Term Offered: Spring, Summer, Fall

HED 6850 Critical Issues In Higher Education
[3 credit hours]
This seminar exposes students to critical issues in higher education. Topics covered vary from course to course in order to stay current with ongoing and emerging critical issues.
Term Offered: Spring, Summer, Fall

HED 6940 Master's Practicum In Higher Education
[3 credit hours]
The Practicum Seminar provides students with the opportunity to develop specialized skills working in a professional/administrative unit of a college or university. Students are expected to complete a 200 hours of work under the supervision of an experienced administrator. Seminar coursework accompanies the practicum experience.
Term Offered: Spring, Summer, Fall

HED 6960 Master's Thesis In Higher Education
[1-3 credit hours]
Open to graduate students who elect the completion of a research thesis in fulfilling the research requirements of the master's program.
Term Offered: Spring, Summer, Fall

HED 6980 Master's Capstone Seminar
[3 credit hours]
This seminar provides opportunities for students to strengthen their academic and professional skills and to apply them in different higher education contexts. The culminating requirements may vary.
Term Offered: Spring

HED 6990 Independent Study In Higher Education-Masters
[1-3 credit hours]
Provides student the opportunity to work independently on a professional problem under the direction of a Higher Education Program faculty member.
Term Offered: Spring, Summer, Fall

HED 7900 Diversity Leadership in Higher Education
[3 credit hours]
Diversity Leadership in Higher Education explores issues of diversity on campuses through foundational and contemporary lenses. It is intended for students studying higher education as a major or area of research interest, as well as employees in institutions of higher education at all levels. The course defines diversity in higher education settings and explores diversity through student, faculty, and administrative lenses, including the components of an effective diversity office on campus.
Term Offered: Spring, Summer, Fall

HED 7980 Special Topics In Higher Education
[1-3 credit hours]
This seminar provides advanced study in special topics of interest to faculty and administrators in higher education.
Term Offered: Summer, Fall

HED 8010 Historical Foundations of Higher Education
[3 credit hours]
The course provides a comprehensive examination of the foundations of higher education in the United States. Special attention is given to the relationship between higher education and society over time, central philosophical assumptions, key historical and social events that shaped the field, evolving conceptualizations of education, and the higher education diversity of people, institutions, and ideas. The course also aims to equip students with knowledge about historical analysis, and skills to conduct archival research.
Term Offered: Spring, Fall

HED 8030 Federal And State Policy Analysis
[3 credit hours]
Designed for those interested in federal and state policy as related to higher education. Students will investigate specific federal and state legislation and regulatory issues.
Term Offered: Summer

HED 8120 International Education
[3 credit hours]
Complex interrelationships between global issues and educationaal systems will be examined. Emphasis will be on how education can be used to build a more global society. Some sections of the course will include an international field study trip.
Term Offered: Summer

HED 8270 Learning and Teaching in Higher Education
[3 credit hours]
Course facilitates application of theory to practice of teaching in higher education. Students explore diverse pedagogical approaches, professional faculty roles effective learning and teaching.

HED 8530 Research Perspectives on Student Development
[3 credit hours]
This course is designed to enhance students' understanding of the wide array of theories that inform the developmental processes of college students. Special focus falls on recent theories on student learning, growth, and development, including holistic models of development; issues of diversity in development; ways to utilize theory to understand, explain, analyze, and predict behavior; and the extent to which seminal theories and models are used to guide empirical research.
Term Offered: Spring, Summer, Fall

HED 8570 Foundational Seminar in Higher Education
[3 credit hours]
This course provides an introduction to doctoral studies, reviews research approaches in the field of higher education, and initiates students' dissertation research planning. Students learn how to conduct and critique higher education research, what sources of research and databases are available to them, and how to develop and present a research study proposal.
Term Offered: Spring, Fall

HED 8640 Models of University Organization and Governance
[3 credit hours]
This course provides a comprehensive examination of the governance and administration of U.S. colleges and universities, and of the diversity of models of governance available in higher education scholarship. We consider such topics as models of governance, locus of control, shared governance, leadership, community, state, and federal influences on institutional administration, and strategic environments. The course also aims to equip students with analytic skills and perspectives that guide their research and practice of leadership and management.
Term Offered: Spring, Summer, Fall

HED 8650 Community College Leadership
[3 credit hours]
This course examines community college leadership and administration. It introduces models for leading change and explores challenges facing community college leaders.
Term Offered: Summer

HED 8700 Economics and Financing of Higher Education
[3 credit hours]
This course focuses on issues of economics and financing of higher education institutions including historical evolution of funding philosophies, sources of revenue for colleges and universities, expenditure streams and their connection to educational outcomes, institutional budgets, and how sources of funds drive educational policymaking. In addition, the course explores values and concerns of public funding, public and private sector investment in higher education, and the role of fundraising in institutional financing.
Term Offered: Spring, Summer, Fall

HED 8730 Higher Education Law and Policy
[3 credit hours]
This course focuses on a range of constitutional, statutory, case, and common law principles that directly influence higher education policy and the operation of colleges and universities.
Term Offered: Spring, Summer, Fall

HED 8770 Research and Assessment of Student Outcomes in Higher Education
[3 credit hours]
This course examines the philosophy and practice of assessment and evaluation in higher education. Issues to be covered include the Input-Environment-Outcomes model, and planning, implementing, and improving assessment in higher education.
Term Offered: Spring, Summer, Fall

HED 8850 Critical Issues In Higher Education
[3 credit hours]
This seminar exposes students to critical issues in higher education. Topics covered vary from course to course in order to stay current with ongoing and emerging critical issues.
Term Offered: Summer, Fall

HED 8910 Introduction to Interpretive Inquiry
[3 credit hours]
This course equips students with basic knowledge and abilities to conduct qualitative research. It fosters understanding of methodology and methods, and their alignment with a particular research tradition.
Term Offered: Spring, Fall

HED 8920 Advanced Seminar
[3 credit hours]
This seminar requires students to work with a professor on the design and implementation of a research project. This project may be qualitative, quantitative, or mixed method. The seminar may be repeated once for credit when topics vary.
Term Offered: Spring, Fall

HED 8930 Doctoral Research Seminar In Higher Education
[3 credit hours]
This course provides students the opportunity to work through the various stages of their dissertation in a seminar format. This course may be repeated once for credit as students progress through stages of the dissertation. These credits may count towards students' dissertation hours.
Term Offered: Spring, Summer, Fall

HED 8940 Doctoral Internship In Higher Education
[1-3 credit hours]
The Internship provides students an opportunity to accummulate supervised experience in college/university administration or teaching. Areas of experience are decided upon in collaboration with a guiding higher education organization or institution, the faculty in the Higher Education Program, and the individual student.
Term Offered: Summer, Fall

HED 8960 Dissertation
[1-12 credit hours]
Original and specific research problem of a scholarly nature, requiring the application of advanced research skills and techniques to study. Students must take a minimum of 10 dissertation credit hours.
Term Offered: Spring, Summer, Fall

HED 8990 Independent Study In Higher Education
[1-3 credit hours]
Provides student the opportunity to work independently on a professional problem under the direction of a Higher Education Program faculty member.
Term Offered: Spring, Summer, Fall

TSOC 5000 Introduction to Educational Theory and Social Foundations
[3 credit hours]
This course prepares master's students for professional activity and research in the interdisciplinary field of Social Foundations of Education. It draws on social sciences and humanities to interpret and critique the relationship between school and society.
Term Offered: Fall

TSOC 5100 Network Theory and Educational Reform
[3 credit hours]
This course examines intrapersonal and interpersonal principles of high performing teams and the impact of meaningful relationships both in real-world and virtual environments. Individual and group dynamics are explored through foundational (sociological, philosophical) and political lenses. The course explores elements of effective group membership and leadership in both theoretical and practical applications.
Term Offered: Spring, Summer, Fall

TSOC 5110 Modern Educational Controversies
[3 credit hours]
Examines controversial contemporary educational issues, the forces that perpetuate them and the socio-cultural contexts in which they exist. Teachers' work and ethical tenets shaping practice are also examined.
Term Offered: Spring, Summer

TSOC 5200 Sociology of Education
[3 credit hours]
Introduction to sociological theory and method through critical examination of the socio-cultural foundations of schooling in the United States, including purposes of schooling in a multicultural society and the resulting nature of teacher work.
Term Offered: Spring, Summer, Fall

TSOC 5210 Social Justice in American Society
[3 credit hours]
Examines through models of social justice how race, class, gender, ethnicity and disability intersect with power, culture, knowledge and ideology in American schools and other institutions to influence the lives of citizens in a multicultural society.
Term Offered: Spring

TSOC 5230 Critical Responses to Deculturalization
[3 credit hours]
In-depth history of racial and ethnic minorities in the U.S. and the ongoing tension between deculturalization and democratic pluralism in P-12 and higher education including current theories and practical applications.
Term Offered: Spring

TSOC 5300 Philosophy of Education
[3 credit hours]
The course explores the nature of philosophical inquiry as foundational to the theory and practice of education, including teaching, through the exploration of competing philosophical traditions. The course provides an opportunity for students to articulate their own philosophy of education.
Term Offered: Spring, Summer, Fall

TSOC 5400 History of Education
[3 credit hours]
This course examines the evolving role of schooling and teaching over time in the US as an instrument of education. It uses history to reflect on the relationship of schooling to other social institutions, groups of people, and the process of social change. It encourages students from across the spectrum of educational areas of study to historically contextualize their discipline and their own practice.
Term Offered: Spring, Fall

TSOC 5500 Anthropology of Education
[3 credit hours]
Examination of cross-cultural, comparative and other studies directed toward understanding processes of cultural transmission and transformation, and implications of anthropological research for contemporary issues in education.
Term Offered: Spring, Summer, Fall

TSOC 5600 Foundations of Peace Education
[3 credit hours]
The purpose of this course is to introduce the basic concepts, theories, and approaches to peace education. The course explores the theories of peace education, including pedagogical approaches to peace-learning. The course also introduces the substantive areas of peace education.
Term Offered: Summer, Fall

TSOC 6000 Women, Culture And Pedagogy
[3 credit hours]
This course surveys works of prominent feminist scholars in order to address the impact of dominant ideology upon the lives of women and girls in American schools.

TSOC 6120 International Education
[3 credit hours]
Complex interrelationships between global issues and education systems will be examined. Emphasis will be on how education can be used to build a more global society. Some sections of the course will include an international field trip.
Term Offered: Spring, Fall

TSOC 6140 School-State Relations
[3 credit hours]
This course provides an examination of the historical, legal, and sociological interactions between state and schooling in the US. It explores the historical development of the social, political, and economic purposes of schooling and the impact on diverse populations. It offers students an opportunity to examine issues such as how schools have defined a good citizen and what they have done to create these in religious and secular means.
Term Offered: Spring, Fall

TSOC 6190 Seminar In Educational Theory/Social Foundations
[3 credit hours]
The collaborative study of a specific topic in educational theory and social foundations by a group of advanced students under the direction of one or more professors.
Term Offered: Spring, Fall

TSOC 6240 Sociological Analyses Of Urban Education
[3 credit hours]
Development and dynamics of schooling in urban centers across the United States, including historical and critical analyses of current problems, issues and reform initiatives.
Prerequisites: TSOC 5200 with a minimum grade of D- or TSOC 5210 with a minimum grade of D- or TSOC 7200 with a minimum grade of D- or TSOC 7210 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

TSOC 6310 Major Educational Theorists
[3 credit hours]
An examination of selected educational philosophers who have addressed themselves to the problem of the ends and means of education from Classical Hellenic Times to the present.
Term Offered: Spring, Fall

TSOC 6320 Education And The Democratic Ethic
[3 credit hours]
Examination of the interdependence among education, democracy and ethics in the context of civic life. Applications made to the practice of schooling as cultural production in a democratic society.
Prerequisites: TSOC 5200 with a minimum grade of D- or TSOC 5300 with a minimum grade of D- or TSOC 5400 with a minimum grade of D- or TSOC 7200 with a minimum grade of D- or TSOC 7300 with a minimum grade of D- or TSOC 7400 with a minimum grade of D-
Term Offered: Spring, Fall

TSOC 6330 Corrective Justice and the Ethics of Conflict
[3 credit hours]
This course provides an overview of theories and principles of corrective justice and the ethics of conflict as well as the application of these theories and principles to matters of justice and injustice.
Term Offered: Spring, Fall

TSOC 6340 Human Rights Education
[3 credit hours]
The purpose of this seminar is to explore the nature of human rights and human rights education. The origin, definition, content, scope, foundation, and correlative duties of human rights, as well as, the theory of human rights education will be explored.
Term Offered: Spring, Fall

TSOC 6350 Environmental Ethics and Education
[3 credit hours]
The purpose of this seminar is to explore the nature of environmental ethics and its implications for educational theory, in particular moral and civic education.
Term Offered: Fall

TSOC 6360 Theories of Justice and Educational Policy
[3 credit hours]
The purpose of this class is to explore prominent theories of distributive justice in a liberal democratic republic and to analyze key educational policy issues from the perspective of those theories.
Term Offered: Spring, Fall

TSOC 6900 Master's Seminar in Educational Theory and Social Foundations
[3 credit hours]
Students are guided step by step to propose, research, and write a Master's thesis or project. Exact format and substance of the thesis or project is highly individualized, reflecting nature of students' interests, audiences, and purposes.
Term Offered: Spring, Fall

TSOC 6960 Master's Thesis In Educational Theory And Social Foundations
[1-3 credit hours]
A formal, independent study culminating in a written discourse that advances our understanding of educational theory or social foundations.
Term Offered: Spring, Summer, Fall

TSOC 6980 Master's Project In Educational Theory And Social Foundations
[1-3 credit hours]
A formal, independent project applying principles of educational theory or social foundations to analyze a particular problem and culminating in a written discourse.
Term Offered: Spring, Summer, Fall

TSOC 6990 Independent Study In Educational Theory And Social Foundations
[1-3 credit hours]
Directed study of a current topic in educational theory and social foundations. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Summer, Fall

TSOC 7100 Network Theory and Educational Reform
[3 credit hours]
This course examines intrapersonal and interpersonal principles of high performing teams and the impact of meaningful relationships both in real-world and virtual environments. Individual and group dynamics are explored through foundational (sociological, philosophical) and political lenses. The course explores elements of effective group membership and leadership in both theoretical and practical applications.
Term Offered: Spring, Summer, Fall

TSOC 7110 Modern Educational Controversies
[3 credit hours]
Examines controversial contemporary educational issues, the forces that perpetuate them and the socio-cultural contexts in which they exist. Teachers' work and ethical tenets shaping practice are also examined.
Term Offered: Spring, Summer

TSOC 7200 Sociology of Education
[3 credit hours]
Introduction to sociological theory and method through critical examination of the socio-cultural foundations of schooling in the United States, including purposes of schooling in a multicultural society and the resulting nature of teacher work.
Term Offered: Spring, Summer, Fall

TSOC 7210 Social Justice in American Society
[3 credit hours]
Examines through models of social justice how race, class, gender, ethnicity and disability intersect with power, culture, knowledge and ideology in American schools and other institutions to influence the lives of citizens in a multicultural society.
Term Offered: Spring

TSOC 7230 Critical Responses to Deculturalization
[3 credit hours]
In-depth history of racial and ethnic minorities in the U.S. and the ongoing tension between deculturalization and democratic pluralism in P-12 and higher education including current theories and practical applications.
Term Offered: Spring

TSOC 7300 Philosophy of Education
[3 credit hours]
The course explores the nature of philosophical inquiry as foundational to the theory and practice of education, including teaching, through the exploration of competing philosophical traditions. The course provides an opportunity for students to articulate their own philosophy of education.
Term Offered: Spring, Summer, Fall

TSOC 7400 History of Education
[3 credit hours]
This course examines the evolving role of schooling and teaching over time in the US as an instrument of education. It uses history to reflect on the relationship of schooling to other social institutions, groups of people, and the process of social change. It encourages students from across the spectrum of educational areas of study to historically contextualize their discipline and their own practice.
Term Offered: Spring, Fall

TSOC 7500 Anthropology of Education
[3 credit hours]
Examination of cross-cultural, comparative and other studies directed toward understanding processes of cultural transmission and transformation, and implications of anthropological research for contemporary issues in education.
Term Offered: Spring, Summer, Fall

TSOC 7600 Foundations of Peace Education
[3 credit hours]
The purpose of this course is to introduce the basic concepts, theories, and approaches to peace education. The course explores the theories of peace education, including pedagogical approaches to peace-learning. The course also introduces the substantive areas of peace education.
Term Offered: Summer, Fall

TSOC 8000 Women, Culture, And Pedagogy
[3 credit hours]
This course surveys works of prominent feminist scholars in order to address the impact of dominant ideology upon the lives of women and girls in American schools.

TSOC 8100 Seminar in Social & Philosophical Foundations of Education
[3 credit hours]
This course prepares doctoral students for professional activity and research in the interdisciplinary field of Social Foundations of Education. It draws on social sciences and humanities to interpret and critique the relationship between school and society.
Term Offered: Fall

TSOC 8120 International Education
[3 credit hours]
Complex interrelationships between global issues and education systems will be examined. Emphasis will be on how education can be used to build a more global society. Some sections of the course will include an international field trip.
Term Offered: Spring, Fall

TSOC 8140 School-State Relations
[3 credit hours]
This course provides an examination of the historical, legal, and sociological interactions between state and schooling in the US. It explores the historical development of the social, political, and economic purposes of schooling and the impact on diverse populations. It offers students an opportunity to examine issues such as how schools have defined a good citizen and what they have done to create these in religious and secular means.
Term Offered: Spring, Fall

TSOC 8150 CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT
[3 credit hours]
This course aims to develop a broader understanding of the role of culture in psychological processes and the implications of such psychological understanding for a culturally diverse society.
Term Offered: Spring

TSOC 8190 Seminar In Educational Theory/Social Foundations
[3 credit hours]
The collaborative study of a specific topic in educational theory and social foundations by a group of advanced students under the direction of one or more professors.
Term Offered: Spring, Fall

TSOC 8240 Sociological Analyses Of Urban Education
[3 credit hours]
Development and dynamics of schooling in urban centers across the United States, including historical and critical analyses of current problems, issues and reform initiatives.
Prerequisites: TSOC 5200 with a minimum grade of D- or TSOC 5210 with a minimum grade of D- or TSOC 7200 with a minimum grade of D- or TSOC 7210 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

TSOC 8310 Major Educational Theorists
[3 credit hours]
An examination of selected educational philosophers who have addressed themselves to the problem of the ends and means of education from Classical Hellenic Times to the present.
Term Offered: Spring, Fall

TSOC 8320 Education And The Democratic Ethic
[3 credit hours]
Examination of the interdependence among education, democracy and ethics in the context of civic life. Applications made to the practice of schooling as cultural production in a democratic society.
Prerequisites: TSOC 5200 with a minimum grade of D- or TSOC 5300 with a minimum grade of D- or TSOC 5400 with a minimum grade of D- or TSOC 7200 with a minimum grade of D- or TSOC 7300 with a minimum grade of D- or TSOC 7400 with a minimum grade of D-
Term Offered: Spring, Fall

TSOC 8330 Corrective Justice and the Ethics of Conflict
[3 credit hours]
This course provides an overview of theories and principles of corrective justice and the ethics of conflict as well as the application of these theories and principles to matters of justice and injustice.
Term Offered: Spring, Fall

TSOC 8340 Human Rights Education
[3 credit hours]
The purpose of this seminar is to explore the nature of human rights and human rights education. The origin, definition, content, scope, foundation, and correlative duties of human rights, as well as, the theory of human rights education will be explored.
Term Offered: Spring, Fall

TSOC 8350 ENVIRONMENTAL ETHICS AND EDUCATION
[3 credit hours]
The purpose of this seminar is to explore the nature of environmental ethics and its implications for educational theory, in particular moral and civic education.
Term Offered: Fall

TSOC 8360 Theories of Jstce and Ed Plcy
[3 credit hours]
The purpose of this class is to explore prominent theories of distributive justice in a liberal democratic republic and to analyze key educational policy issues from the perspective of those theories.
Term Offered: Spring, Fall

TSOC 8380 Methods of Normative Theory Construction
[3 credit hours]
The purpose of this course is to explore methods of and approaches to normative theory construction. The central goal of the course is to equip doctoral students in the field of educational theory and social foundations, among other students whose fields engage in normative theory, the understanding and skill necessary to engage in normative theory construction. Normative theory refers to systematic moral, political, social, and educational conceptions that rationally account for adjust what ought to be (rather than empirical theory that accounts for what is). In the discipline of normative theorizing a number of methods of and approaches to theory construction have been developed as a means to the development and analysis of normative theory. There are two main approaches to theory construction in this field: deontological and teleological approaches.
Term Offered: Spring, Fall

TSOC 8390 Methods of Conceptual Analysis and Textual Interpretation
[3 credit hours]
The purpose of this research methods course is to explore prominent methods and approaches Central Analysis and Textual Interpretation. These methods and approaches constitute the research tools in the field of educational theory and social foundations, among other fields of inquiry. The central goal of the course is to equip doctoral students in field of educational theory and social foundations, among other students whose fields engage in theoretical research, the understanding and skill necessary to engage in theoretical research.

TSOC 8960 Dissertation Research In Foundations Of Education
[1-12 credit hours]
A formal, independent study culminating in a written discourse central to the advancement of knowledge in educational theory or social foundations.
Term Offered: Spring, Summer, Fall

TSOC 8990 Independent Study In Educational Theory And Social Foundations
[1-6 credit hours]
Directed study of a current topic in educational theory and social foundations. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Summer, Fall

Certificate in Higher Education Administration

The Certificate in Higher Education Administration is designed for students interested in studying institutional administration and higher education learning environments. Course focus the administration, governance, and operation of institutions of higher education, as well as student growth and the creation of beneficial learning environments for all members of the academic community.

The Certificate is a 12 semester hour program. The certificate is available to students from any major and courses may be included as part of a master's program with the approval of the faculty advisor. Coursework is completed online.

Admission to the Certificate in Higher Education Administration

In addition to admission requirements of the college of Graduate Studies, admission to the certificate program requires the following:

- A baccalaureate degree from an accredited college or university
- A well-written statement of purpose describing your background and goals as well as the importance of this certificate program in achieving those goals
- A current resume or curriculum vitae

The certificate program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Statement of purpose
- Resume or curriculum vitae

Requirements for the Certificate in Higher EDUCATION Administration

Code	Title	Hours
Select two courses from Institutional Administration:		6
HED 5900	Diversity Leadership in Higher Education	
HED 6640	Governance And Administration In Higher Education	
HED 6700	Finance Of Higher Education	
HED 6730	Legal Aspects Of Higher Education	
Select two courses from Learning Environments:		6
HED 6530	Theories Of Student Development	
HED 6010	History Of Higher Education	
HED 6510	The American College Student	
HED 6770	Evaluation And Outcomes Assessment In Higher Education	
Total Hours		**12**

Courses may be included as part of a master's degree program as approved by the student's faculty advisor.

All coursework and requirements of the certificate must be taken within a four-year period immediately preceding the date the degree is awarded.

- PLO 1: Demonstrate ability to trace and analyze historical and philosophical development trends in higher education and their impact on current practice in higher education.
- PLO 2: Demonstrate ability to identify and apply governance, leadership, organizational, and administrative practices that assist institutions in accomplishing their missions.
- PLO 3: Demonstrate ability to assess student/program outcomes to inform current practice in higher education.
- PLO 4: Demonstrate ability to create diverse environments that foster diverse student learning and development in higher education.
- PLO 5: Demonstrate knowledge of higher education law to guide professional practice.
- PLO 6: Demonstrate knowledge of higher education finance to guide professional practice.

Graduate Certificate for Principal Licensure

The Certificate for Principal Licensure is designed for Ohio educators who hold a master's degree in an education related field and wish to earn a license as a building level administrator. This certificate program includes coursework that will lead toward initial administrator license in grades PreK to 6, grades 4 to 8, or grades 5 to 12 for Ohio.

The certificate is an 18 semester hour program. Coursework is completed online with 220 hours of practicum experiences in PK-12 schools.

ADMISSION TO THE CERTIFICATE FOR PRINCIPAL LEADERSHIP

In addition to admission requirements of the college of Graduate Studies, admission to the certificate program requires the following:

- A master's degree from an accredited college or university
- An overall undergraduate GPA of 2.7 or higher
- One letter of recommendation from a direct supervisor addressing formal teaching evaluations and who is knowledgeable about your ability to engage in graduate work in this certificate program
- A current Ohio educator license

The certificate program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

WHAT TO SUBMIT WITH YOUR APPLICATION

- Official transcripts from all institutions of higher education
- One letter of recommendation
- Resume or curriculum vitae
- Copy of current teaching license(s)

REQUIREMENTS FOR THE CERTIFICATE FOR PRINCIPAL LICENSURE

For the certificate, students must complete the following program requirements:

- A minimum of 18 semester hours of specialization in educational administration and supervision

All coursework and requirements of the certificate must be taken within a four-year period immediately preceding the date the degree is awarded.

Certificate Coursework

Code	Title	Hours
Select the following:		
EDAS 6000	The Individual In Organizations	3
EDAS 6020	Instructional Leadership and Supervision	3
EDAS 6010	Leadership in School Curriculum	3
EDAS 6110	Legal Aspects Of School Administration	3
EDAS 6190	Field Experience in School Administration	3
EDAS 6440	Equity Issues In Educational Finance And Economics	3
Total Hours		**18**

Additional Requirements

Prior to Applying for Ohio Administrator License

- Acceptable scores on the Ohio Assessment for Educators (OAE) Content Assessment(s) for the licensure area

The following courses are all required for the Plan of Study for the Principal Licensure Certificate. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Year		
First Term		**Hours**
EDAS 6010	Leadership in School Curriculum	3
EDAS 6110	Legal Aspects Of School Administration	3
	Hours	**6**
Second Term		
EDAS 6020	Instructional Leadership and Supervision	3
EDAS 6440	Equity Issues In Educational Finance And Economics	3
EDAS 6190	Field Experience in School Administration	3
	Hours	**9**
Third Term		
EDAS 6000	The Individual In Organizations	3
	Hours	**3**
	Total Hours	**18**

- PLO 1: Vision, Ethics, and Continuous Improvement- Lead the development and implementation of a mission and vision grounded in equity, ethics, and professional norms. Apply improvement processes using data, technology, and community engagement to support student and adult success.
- PLO 2: Equity and Instructional Leadership - Advocate for equitable access and culturally responsive practices. Design and implement systems for curriculum, instruction, assessment, and supports that create inclusive, technology-rich, and data-informed learning environments.
- PLO 3: Community and Organizational Leadership - Engage families, community members, and external partners to strengthen learning and improvement efforts. Lead operations, governance, and resource planning using equitable, legally compliant, and data-informed practices.
- PLO 4: Professional Capacity and Applied Leadership - Recruit and support staff, foster collaboration, and lead systems for supervision, evaluation, and professional learning. Apply leadership knowledge and skills through authentic, sustained experiences across diverse school settings.

Master of Education in Educational Administration and Supervision

The Master of Education in Educational Administration and Supervision is designed to develop instructional leaders who can use data for school improvement to enhance student learning. Students are prepared for practice by mastering knowledge, practicing skills and developing moral and ethical standards for leadership. Students in this program earn a master's degree and complete requirements for an initial Ohio administrator license in grades PreK to 6, grades 4 to 8, or grades 5 to 12.

The ME in Educational Administration and Supervision is a 30 semester hour program. Students take courses in educational administration along with education courses selected with a faculty adviser based on the student's interests and goals. The program culminates with the completion of a master's research seminar, research-based project, thesis, or practicum experience depending on the student's interest. Coursework is completed online with practicum experiences in PK-12 schools.

Admission to the ME in Educational Administration and Supervision

In addition to admission requirements of the College of Graduate Studies, admission to the master's program requires the following:

- A baccalaureate degree from an accredited four-year institution
- A well-written statement of purpose describing your background and goals as well as the importance of this degree in achieving those goals
- One letter of recommendation regarding your potential for doing master's level work from professionals such as an undergraduate major advisor, current employer, school principal or others who are knowledgeable about your ability to engage in graduate work in this degree program
- A current Ohio educators license

The master's program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Statement of purpose
- One letter of recommendation
- Copy of current teaching license(s)
- Resume

Requirements for the ME in Educational Administration and Supervision

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 30 semester hours of approved graduate course work
- An area of specialization in educational administration
- Supporting coursework

- A thesis or a project as a culminating experience

For the Ohio licensure, students must complete additional requirements to fulfill the credential requirements as well as the degree requirements

In addition, no more than six semester hours of credit from any combination of workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

All coursework and requirements of the master's degree must be taken within a six-year period immediately preceding the date the degree is awarded.

Master's Coursework

Code	Title	Hours
Specialization in Educational Adminstration		
EDAS 6000	The Individual In Organizations	3
EDAS 6010	Leadership in School Curriculum	3
EDAS 6020	Instructional Leadership and Supervision	3
EDAS 6110	Legal Aspects Of School Administration	3
EDAS 6190	Field Experience in School Administration	3
EDAS 6440	Equity Issues In Educational Finance And Economics	3
Supporting Coursework		
CI 6650	Teacher Learning and Education	3
EDP 5110	Advanced Educational Psychology	3
TSOC 5300	Philosophy of Education	3
Master's Culminating Experience		**3**
EDAS 6920	Master's Project In Educational Administration	
EDAS 6960	Master's Thesis In Educational Administration	
Total Hours		**30**

additional Requirements

Prior to Applying for Ohio Administrator License

- Acceptable scores on all Ohio Assessment for Educators (OAE) tests specified by the The State of Ohio for the licensure area are required prior to applying for Ohio administrator license.

Guide for Developing a Plan of Study

Below is a guide for developing a Plan of Study for the Master of Education in Administration and Supervision. Students should work with their faculty advisor to identify specific courses to fulfill program requirements.

First Year		
First Term		**Hours**
EDAS 6010	Leadership in School Curriculum	3
EDAS 6110	Legal Aspects Of School Administration	3
EDP 5110	Advanced Educational Psychology	3
	Hours	**9**
Second Term		
EDAS 6020	Instructional Leadership and Supervision	3
EDAS 6440	Equity Issues In Educational Finance And Economics	3
EDAS 6190	Field Experience in School Administration	3
	Hours	**9**
Third Term		
EDAS 6000	The Individual In Organizations	3
	Hours	**3**
Second Year		
Fourth Term		
TSOC 5300	Philosophy of Education	3
CI 6650	Teacher Learning and Education	3
	Hours	**6**
Fifth Term		
EDAS 6920	Master's Project In Educational Administration	3
	Hours	**3**
	Total Hours	**30**

- PLO 1: Vision, Ethics, and Continuous Improvement- Lead the development and implementation of a mission and vision grounded in equity, ethics, and professional norms. Apply improvement processes using data, technology, and community engagement to support student and adult success.
- PLO 2: Equity and Instructional Leadership: Advocate for equitable access and culturally responsive practices. Design and implement systems for curriculum, instruction, assessment, and supports that create inclusive, technology-rich, and data-informed learning environments.
- PLO 3: Community and Organizational Leadership- Engage families, community members, and external partners to strengthen learning and improvement efforts. Lead operations, governance, and resource planning using equitable, legally compliant, and data-informed practices.
- PLO 4: Professional Capacity and Applied Leadership: Recruit and support staff, foster collaboration, and lead systems for supervision, evaluation, and professional learning. Apply leadership knowledge and skills through authentic, sustained experiences across diverse school settings.
- PLO 5: Research- Meaningfully interpret ideas and research from the professional literature to construct and present an argument in response to a question in educational administration.

Master of Education in Educational Theory and Social Foundations

The Master of Education in Educational Theory and Social Foundations is designed for students who are interested in exploring the relationship between education and society broadly, or schools and their communities specifically. Coursework provides students both a foundational base and opportunities to engage in praxis, the merger of theory with practice. While rooted in education, students work with faculty to apply multidisciplinary ideas in analysis and engagement of change in local and global contexts.

The ME in Educational Theory and Social Foundations is a 30 semester hour program. Students take courses both in theory and social foundations of education as well as coursework from outside the discipline that will prepare them to engage in action research in their community. Students are encouraged to complete a certificate during their degree, such as in Urban and Regional Planning, Management of Nonprofit Organizations, Municipal Administration, Disability Studies, or Higher Education Administration. The program culminates with the completion of a research-based project or thesis that demonstrates the link between education and community; students are encouraged to engage in action research as part of this capstone.

Admission to the ME in Educational Theory and Social Foundations

In addition to admission requirements of the College of Graduate Studies, admission to the master's program requires the following:

- A baccalaureate degree from an accredited four-year institution
- A well-written statement of purpose describing your background and goals as well as the importance of this degree in achieving those goals
- Two letters of recommendation regarding your potential for doing master's level work from professionals such as an undergraduate major advisor, current employer, school principal or others who are knowledgeable about your ability to engage in graduate work in this degree program

The master's program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Statement of Purpose: Students are required to submit a statement of purpose that details why they wish to enroll in this program, and their beliefs about the linkages between schools and community
- Two letters of recommendation

Requirements for the ME in Educational Theory and Social Foundations

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 30 semester hours of approved graduate course work
- 15 credit hours a core in educational theory and social foundations that includes the following required courses: TSOC 5000, 5200, 5300, 5400,and 5500
- 12 credit hours in a cognate area. Students are encouraged to choose coursework in the following areas that would lead to one of the following certificates:
  - Geography and Planning: Graduate Certificate in Urban and Regional Planning
  - Peace Education: Certificate in Peace and Justice Studies
  - Political Science and Public Administration: Certificate in Management of Nonprofit Organizations
  - Higher Education: Certificate in Higher Education Administration
  - Disability Studies: Certificate in Disability Studies
- 3 credit hours of thesis or project geared around the topic of education and community. Students are encouraged to engage in site-based action research.

All coursework and requirements of the master's degree must be taken within a six-year period immediately preceding the date the degree is awarded.

Guide for Developing a Plan of Study

Below is a guide for developing a Plan of Study for the Master of Education in Educational Theory and Social Foundations. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

Code	Title	Hours
Core in Educational Theory and Social Foundations		
TSOC 5000	Introduction to Educational Theory and Social Foundations	3
TSOC 5200	Sociology of Education	3
TSOC 5300	Philosophy of Education	3
TSOC 5400	History of Education	3
TSOC 5500	Anthropology of Education	3
Cognate Area		**12**
Select one set of courses from one of the following certificate programs:		
Certificate in Urban and Regional Planning		
Cerftificate in Higher Education Administration		
Certificate in Management of Nonprofit Organizations		
Graduate Certificate in Disability Studies		
Certificate in Peace and Justice Studies		
Master's Culminating Experience		**3**
Select one of the following:		
TSOC 6960	Master's Thesis In Educational Theory And Social Foundations	
TSOC 6980	Master's Project In Educational Theory And Social Foundations	
Total Hours		**30**

- PLO 1. Practice academic writing skills.
- PLO 2. Comprehend the disciplinary content of educational theory and social foundations through citation of major scholarship in the field
- PLO 3. Demonstrate knowledge of principles of educational sociology, history, and philosopy.
- PLO 4. Conduct research on or solve a problem regarding a current issue at the intersection of education and community.
- PLO 5. Integrate knowledge of education and community in foundational and contemporary contexts.

Master of Education in Higher Education

The Master of Education in Higher Education degree prepares students to become leaders with a deep understanding of higher education administration issues and practices in two- and four-year colleges and universities. This degree is designed for those interested in pursuing entry-level administrative and professional staff positions in higher education, as well as individuals already working in higher education interested in pursuing mid-level positions.

The ME in Higher Education is a 30 semester hour program. Students take core courses in higher education along with courses selected with a faculty advisor based on the student's interests and goals. The program culminates with the completion of a culminating project that is developed throughout the program and defended in final semester. Coursework is completed online.

Admission to the ME in Higher Education

In addition to admission requirements of the College of Graduate Studies, admission to the master's program requires the following:

- A baccalaureate degree from an accredited four-year institution
- A well-written statement of purpose describing your background and goals as well as the importance of this degree in achieving those goals and pursuing a career in the field of higher education
- Two letters of recommendation regarding your potential for doing master's level work from professionals such as an undergraduate major advisor, current employer, or others who are knowledgeable about your ability to engage in graduate work in this degree program
- A minimum undergraduate grade point average of 3.0 on a 4.0 scale is preferred

The master's program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Statement of purpose
- Two letters of recommendation
- Resume or curriculum vitae

Requirements for the ME in Higher Education

For the Master of Education degree, students must complete the following program requirements:

- 30 semester hours of approved graduate course work
- A culminating project that the students develop throughout their program and defend in their final semester

No more than six semester hours of credit from any combination of workshops (5950), practicum (6940), problems or special topics courses (5980 or 6980), and independent studies (6990), and thesis (6960) may be included in the degree program.

All coursework and requirements of the master's degree must be taken within a six-year period immediately preceding the date the degree is awarded.

Master's coursework

Code	Title	Hours
Specialization in Higher Education		
Select the following:		
HED 5900	Diversity Leadership in Higher Education	3
HED 6010	History Of Higher Education	3
HED 6510	The American College Student	3
HED 6530	Theories Of Student Development	3
HED 6570	Research in Higher Education	3
HED 6640	Governance And Administration In Higher Education	3
HED 6700	Finance Of Higher Education	3
HED 6730	Legal Aspects Of Higher Education	3
HED 6770	Evaluation And Outcomes Assessment In Higher Education	3
HED 6850	Critical Issues In Higher Education	3
Master's Culminating Experience		
A culminating project will be developed throughout the program and defended in final semester		
Total Hours		**30**

GUIDE FOR DEVELOPING A PLAN OF STUDY

Below is a guide for developing a Plan of Study for the Master of Education. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		Hours
HED 6010	History Of Higher Education	3
HED 6730	Legal Aspects Of Higher Education	3
	Hours	**6**
Second Term		
HED 6510	The American College Student	3
HED 6640	Governance And Administration In Higher Education	3
	Hours	**6**

Third Term		
HED 6570	Research in Higher Education	3
	Hours	**3**
Fourth Term		
HED 6770	Evaluation And Outcomes Assessment In Higher Education	3
HED 6850	Critical Issues In Higher Education	3
	Hours	**6**
Fifth Term		
HED 5900	Diversity Leadership in Higher Education	3
HED 6700	Finance Of Higher Education	3
	Hours	**6**
Sixth Term		
HED 6530	Theories Of Student Development	3
Defend Master's Culminating Project		
	Hours	**3**
	Total Hours	**30**

- 1. demonstrate proficiency in using broad and integrated knowledge of historical developments, critical issues, and the varied, complex, and ever changing landscape of higher ed.
- 2. demonstrate proficiency in ability to apply specialized knowledge needed to work effectively in any functional unit of a college campus.
- 3. demonstrate intellectual proficiencies (skills) that higher education leaders must possess including thinking, research, communication and leadership skills.
- 4. demonstrate knowledge and appreciation of the values of higher education including lifelong learning, ethical behavior, civic responsibility, and social justice.

PhD in Foundations of Education

Students in the PhD in Foundations of Education study the broad issues of educational systems and schools. Designed for students interested in research and leadership in foundational areas that support education, this program develops individuals as researchers and leaders in school, governmental, non-governmental/NGO, and nonprofit settings interested in improving education.

The PhD in Foundations of Education is a 60 semester hour program. Students take core educational courses along with courses selected with faculty based on the student's interests and goals. The program culminates with the completion of original research addressing a problem in foundations of education based on the student's area of concentration. Coursework can be completed on campus or through a combination of on-campus and online courses.

There are two areas of concentration.

Educational Psychology: For students interested in focused study of the psychological dimensions of education including teaching, learning, and human development. This program is 100% online.

Foundations of Education: For students interested in focused study of methodological and theoretical interdisciplinary research involving interdisciplinary sociology, anthropology, philosophy and history of education, as well as democratic education, culturally relevant teaching, and social justice.

Admission to the PhD in Foundations of Education

In addition to admission requirements of the College of Graduate Studies, admission to the doctoral program requires the following:

- A master's degree from an accredited college or university
- Previous academic work necessary to successfully complete a doctoral program in the area of study
- Evidence of research and writing ability such as a master's thesis, proctored writing sample, a written research report, one or more reprints of publications, a paper presented to a professional society, or similar evidence of competence
- A statement of purpose that describes why you wish to pursue this doctoral program and includes information on previous study, educational experience, professional accomplishments, immediate and future professional goals, a proposed time schedule for completing the degree, and any other information that you believe is relevant for admission into this doctoral degree program

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- A sample of academic writing (e.g. report, thesis, project, or academic paper)
- Statement of purpose
- Three letters of recommendation
- Resume or curriculum vitae

For the concentrations in foundations of education or educational psychology: a professional interview may be required after the completion of the written application.

DEGREE REQUIREMENTS BY CONCENTRATION

- Educational Psychology (p. 324)
- Foundations of Education (p. 325)

Educational Psychology

For the Doctor of Philosophy in Foundations of Education: Educational Psychology students must complete the following program requirements:

- A minimum of 60 semester credit hours of approved doctoral level (7000/8000 level) course work
- 27 credit hours of courses of specialization in educational psychology
- 9 credit hours of cognate courses within one disciplinary area that is aligned with the degree, chosen from programs in the College.

Examples of cognate disciplines include Higher Education, Theory and Social Foundations, and other complementary programs.
- 12 credit hours of research tools courses in one track. Students are required to chose either a quantitative research track or a qualitative research track.
- A written comprehensive program examination and, if specified, a cognate examination
- An oral comprehensive program examination after passing written examination
- 12 credit hours of dissertation research in educational psychology
- An oral presentation and defense of a dissertation research proposal
- An oral presentation and defense of the completed dissertation research in a public forum
- A written document of the completed dissertation research in approved style and format

All coursework and requirements of the doctoral degree must be taken within a seven-year period immediately preceding the date the degree is awarded.

Other Program Requirements

Coursework Phase

- A doctoral program committee is required after the first 18 hours are completed. The doctoral program committee has a minimum of three members who are selected from the membership of the graduate faculty of the University. The doctoral program committee is responsible for assisting the student in the development of a plan of study and assuring competence by overseeing the comprehensive program written examination and the comprehensive program oral examination.

Program Examinations

- A written comprehensive program examination and, if specified, a cognate examination
- An oral comprehensive program examination after successful completion of the written examination

Dissertation Research Phase

- A doctoral dissertation committee is required immediately after the completion of the required coursework, the comprehensive program written examination, and the comprehensive program oral examination. The dissertation committee has a minimum of four graduate faculty members within the major and/or with expertise related to the dissertation, one of whom is not in the discipline major. The dissertation committee is responsible for guiding dissertation research and approving the dissertation concept, research proposal, and the completed dissertation research, both the written dissertation and oral dissertation defense. Students must work closely with the committee throughout the dissertation process.
- All research with human subjects must be approved by the Institutional Research Board (IRB) before beginning any phase of the research study. Students must complete IRB training as defined by the University's Human Research Protection Program.
- A public defense of the dissertation is required.
- The final written dissertation must be approved by the dissertation committee and formatted according the guidelines of the college and the College of Graduate Study. Electronic submission of the dissertation to *OhioLINK* is mandatory.

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Foundations of Education

For the Doctor of Philosophy in Foundations of Education degree, students must complete the following program requirements:

- A minimum of 60 semester credit hours of doctoral level (7000/8000 level) course work
- 27 credit hours of specialization in foundations of education
- 9 credit hours of cognate courses within one disciplinary area that is aligned with the degree, chosen from programs in the College
- 12 credit hours of research tools courses
- A written comprehensive program examination and, if specified, a cognate examination
- An oral comprehensive program examination after passing written examinations
- 12 credit hours of dissertation research in foundations of education
- An oral presentation and defense of a dissertation research proposal
- An oral presentation and defense of the completed dissertation research in a public forum
- A written document of the completed dissertation research in approved style and format

All coursework and requirements of the doctoral degree must be taken within a seven-year period immediately preceding the date the degree is awarded.

Other Program Requirements

COURSE WORK PHASE

A doctoral program committee is required before the completion of 18 credit hours. The doctoral program committee has a minimum of three members who are selected from the membership of the graduate faculty of the University. The doctoral program committee is responsible for assisting the student in the development of a plan of study and assuring competence by overseeing the comprehensive program written examination and comprehensive program oral examination.

Program EXAMINATIONS

- A written comprehensive program examination and, if specified, a cognate examination
- An oral comprehensive program examination after successful completion of the written examination

Dissertation Research Phase

- A doctoral dissertation committee is required immediately after the completion of the required coursework, comprehensive program written examination, and comprehensive program oral examination. The dissertation committee has a minimum of four graduate faculty members including one who is not in the discipline major. The dissertation committee is responsible for guiding dissertation research and approving the dissertation concept, research proposal, and the completed dissertation research, both the written dissertation and oral dissertation defense. Students must work closely with the committee throughout the dissertation process.

- All research with human subjects must be approved by the Institutional Research Board before beginning any phase of the research study. Students must complete IRB training as defined by the University's Human Research Protection Program.
- A public defense of the dissertation is required.
- The final written dissertation must be approved by the dissertation committee and formatted according the guidelines of the college and the College of Graduate Study. Electronic submission of the dissertation to *OhioLINK* is mandatory.

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GUIDES FOR PLANNING BY CONCENTRATION

- Educational Psychology (p. 326)
- Foundations of Education (p. 326)

Educational Psychology

Guide for Developing a Plan of Study

Below is a guide for developing a Plan of Study for the PhD in Foundations of Education: Educational Psychology. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

Code	Title	Hours
Specialization in Educational Psychology		
EDU 7000	Introduction to Doctoral Studies	3
EDP 7110	Advanced Educational Psychology	3
EDP 7240	Applied Child and Adolescent Development	3
EDP 7250	Addressing Student and Educator Mental Health	3
EDP 7310	Issues And Innovations In Learning And Instruction	3
EDP 8120	School Violence Theory, Prevention, and Intervention	3
EDP 8140	Motivation Theory And Application	3
EDP 8160	Self and Identity	3
EDP 8370	News Media Literacy, Society, and the Mind	3
Cognate Area		**9**
Select courses in one cognate area in the College		
Research Tools		
EDU 7100	Quantitative Research Foundations: Concepts and Practice	3
EDU 7200	Foundations of Qualitative Research	3
EDU 7300	Foundations of Theory	3
Choose one:		3
EDU 8100	Literacy in Advanced Quantitative Methods	
EDU 8400	Advanced Seminar in Research	
Program Examinations		
Approval of Written Exam(s)		
Approval of Oral Exam(s)		
Dissertation Research		**12**
EDP 8960	Dissertation Research In Educational Psychology	
Approval of Research Proposal		
Approval of Oral Presentation of Dissertation Research		
Approval of Dissertation Final Document		
Total Hours		**60**

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Foundations of Education

Guide for Developing a Plan of Study

Below is a guide for developing a Plan of Study for the PhD in Foundations of Education. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

Code	Title	Hours
Specialization in Foundations of Education		
EDU 7000	Introduction to Doctoral Studies	3
TSOC 7200	Sociology of Education	3
TSOC 7300	Philosophy of Education	3
TSOC 7400	History of Education	3
TSOC 7500	Anthropology of Education	3
TSOC 7600	Foundations of Peace Education	3
TSOC 8320	Education And The Democratic Ethic	3
TSOC 8340	Human Rights Education	3
TSOC 8360	Theories of Jstce and Ed Plcy	3
Cognate Area		**9**
Select 9 credit hours in one cognate area in the College		
Research Tools		
EDU 7100	Quantitative Research Foundations: Concepts and Practice	3
EDU 7200	Foundations of Qualitative Research	3
EDU 7300	Foundations of Theory	3
Choose one:		*3*
EDU 8100	Literacy in Advanced Quantitative Methods	
EDU 8400	Advanced Seminar in Research	
Program Examinations		
Approval of Written Exam(s)		
Approval of Oral Exam(s)		
Dissertation Research		**12**
TSOC 8960	Dissertation Research In Foundations Of Education	
Approval of Research Proposal		
Approval of Oral Presentation of Dissertation Research		
Approval of Dissertation Final Document		
Total Hours		**60**

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- PLO 1. demonstrate knowledge of the disciplinary content of educational theory and social foundations through citation, synthesis, analysis, and interpretation of major scholarship in the field;

- PLO 2. demonstrate knowledge of principles and theories of educational sociology, history of education, philosophy of education, and general foundations of education of education through cited, analytic discussion of classic and current research in those disciplines;
- PLO 3. demonstrate ethical dispositions in teaching and research through the quality and integrity of their scholarship, teaching methods, and participation in the academic and civic community as demonstrated in their mentored work (compensated or voluntary) in the program and community;
- PLO 4. explain specific research methodologies including the theoretical assumptions upon which they are based, the methods of data collection and analysis, the issues of representation, and the foundations of validity, and explain when they are most appropriate to use (i.e., with what research problems or questions);
- PLO 5. collect, analyze and interpret, with a level of validity acceptable within a research community, at least one of the following types of research data: quantitative, qualitative, and/or interpretive;

PhD in Higher Education

The Doctor or Philosophy in Higher Education is designed to prepare students for successful professional careers in diverse higher education settings, including public and private colleges and universities, government agencies, and professional associations. The doctoral program focuses on Administration and Policy Analysis.

The PhD in Higher Education is a 60 semester hour program. Students take core educational courses along with courses selected with faculty based on the student's interests and goals. The program culminates with the completion of original research addressing a problem in higher education based on the student's area of interests and goals. The program is fully online, combining synchronous (via video-conferencing platforms) and asynchronous (via Blackboard) instruction and student guidance.

Admission to the PhD in Higher Education

In addition to admission requirements of the College of Graduate Studies, admission to the doctoral program requires the following:

- A master's degree from an accredited college or university
- A minimum GPA of 3.5 on a 4.0 scale for all previous graduate academic work
- Previous academic work necessary to successfully complete a doctoral program in the area of study
- A statement of purpose indicating your commitment to pursuing a career in the field of higher education, and a description of your potential research topic for dissertation study
- A sample graduate paper (or essay, article, etc.) demonstrating conceptualization and writing skills
- Two letters of reference, including at least one from a faculty member who can speak to your ability to conduct research and to write at the graduate level
- Current employment in a higher education environment and at least three years of work experience in higher education

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Statement of purpose
- Writing sample
- Two letters of recommendation
- Resume or curriculum vitae

Requirements for the PhD in Higher Education

For the Doctor of Philosophy in Higher Education degree, students must complete the following program requirements:

- A minimum of 60 semester credit hours of approved doctoral level (7000/8000 level) course work
- 21 credit hours of higher education specialization
- 9 credit hours of supporting courses from other doctoral areas in the College
- 15 credit hours of assessment, evaluation, and research tools
- A written comprehensive program examination
- An oral comprehensive program examination after passing written examination
- 15 credit hours of dissertation research
- An oral presentation and defense of a dissertation research proposal
- An oral presentation and defense of the completed dissertation research in a public forum
- A written document of the completed dissertation research in approved style and format

All coursework and requirements of the doctoral degree must be taken within a seven-year period immediately preceding the date the degree is awarded.

Other Program Requirements

Coursework Phase

- A doctoral program committee is required before the completion of 18 credit hours. The doctoral program committee has a minimum of three members who are selected from the membership of the graduate faculty of the University. The doctoral program committee is responsible for assisting the student in the development of a plan of study and assuring competence by overseeing the comprehensive program written examination and the comprehensive program oral examination.

Program Examinations

- A written comprehensive program examination
- An oral comprehensive program examination after successful completion of the written examination

Dissertation Research Phase

- A doctoral dissertation committee is required immediately after the completion of the required coursework and comprehensive program written and oral examinations. The dissertation committee has a minimum of four graduate faculty members including one who is not in the discipline major. The dissertation committee is responsible for guiding dissertation research and approving the dissertation concept, research proposal, and the completed dissertation research, both the written dissertation and oral dissertation defense. Students must work closely with the committee throughout the dissertation process.
- All research with human subjects must be approved by the Institutional Research Board before beginning any phase of the research study. Students must complete IRB training as defined by the University's Human Research Protection Program.
- A public defense of the dissertation is required.
- The final written dissertation must be approved by the dissertation committee and formatted according the guidelines of the college and the College of Graduate Study. Electronic submission of the dissertation to *OhioLINK* is mandatory.

Guide for Developing a Plan of Study

Below is a guide for developing a Plan of Study for the PhD in Higher Education. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

Code	Title	Hours
Specialization in Higher Educational		
EDU 7000	Introduction to Doctoral Studies	3
HED 8010	Historical Foundations of Higher Education	3
HED 8270	Learning and Teaching in Higher Education	3
HED 8530	Research Perspectives on Student Development	3
HED 8640	Models of University Organization and Governance	3
HED 8700	Economics and Financing of Higher Education	3
HED 8730	Higher Education Law and Policy	3
Supporting Area		**9**
Select 9 credits from other doctoral areas in the College following advisor guidance		
Assessment, Evaluation, and Research Tools		
EDU 7100	Quantitative Research Foundations: Concepts and Practice	3
EDU 7200	Foundations of Qualitative Research	3
EDU 7300	Foundations of Theory	3
HED 8930	Doctoral Research Seminar In Higher Education	3
Choose one:		3
EDU 8100	Literacy in Advanced Quantitative Methods	
EDU 8400	Advanced Seminar in Research	
Program Examinations		
Approval of Written Exam(s)		
Approval of Oral Exam(s)		
Dissertation Research		**15**
HED 8960	Dissertation	
Approval of Research Proposal		
Approval of Oral Presentation of Dissertation Research		
Approval of Dissertation Final Document		
Total Hours		**60**

- Use, design, and conduct rigorous research in higher education.
- Lead and communicate effectively across college/university areas.
- Integrate knowledge and best practices from diverse areas to solve existing problems across institutional units.
- Analyze and navigate institutional environments in order to inform effective strategies.
- Synthesize and use knowledge of student learning and development to inform creation of effective learning environments.

Department of English Language and Literature

Andrew Mattison, Chair

Joey S. Kim, Director of Graduate Studies, Advisor for Graduate Students in Literature

Anthony Edgington, Advisor for the Graduate Certificate in the Teaching of Writing

MA in English candidates must submit a satisfactory MA Portfolio, details of which can be obtained from the English Graduate Advisor.

Degrees Offered

- Graduate Certificate in the Teaching of Writing (p. 331)
- Masters in English (https://catalog.utoledo.edu/graduate/arts-social-sciences-education/departments-schools/masters-english/)

ENGL 5090 Current Writing Theory
[3 credit hours]
An intensive study of current theories and research connecting reading, critical thinking and writing with applications of theory to students' literate practices and research.
Term Offered: Spring, Fall

ENGL 5100 The History Of English
[3 credit hours]
Study of the changes that have taken place in the English language from the earliest days to the present.
Term Offered: Spring, Summer, Fall

ENGL 5110 Old English
[3 credit hours]
Study of the phonology, morphology and syntax of Old English, with special attention to literary and cultural backgrounds. Representative readings in verse and prose.
Term Offered: Spring, Fall

ENGL 5150 Linguistic Principles
[3 credit hours]
Intensive study of modern linguistic theories about the nature and structure of language, with emphasis on English.
Term Offered: Spring, Fall

ENGL 5190 Sociolinguistics
[3 credit hours]
Combines linguistic and societal concerns through reading of empirical research; includes issues of language variation and related larger constructs such as speech community, communicative competence, dialect, and language change.
Term Offered: Spring, Fall

ENGL 5210 Issues in ESL Writing
[3 credit hours]
Course content
Term Offered: Spring, Fall

ENGL 5280 American Fiction: 20th and 21st Century
[3 credit hours]
Major developments in the 20th-century and 21st Century American short story and novel. Recommended: ENGL 3600 or 3790.
Term Offered: Spring, Fall

ENGL 5300 Medieval and Early Tudor Drama
[3 credit hours]
A study of drama and performance from the British Isles and relevant continental traditions in the late middle ages through the early 16th century, in their cultural, material, and performance contexts. Course may include performance traditions and texts such as monastic and liturgical drama, civic Creation-to-Doomsday play cycles manuscript collections of drama, morality plays, miracle and saints' plays, folk plays, courtly interludes and mummings, and royal entries, as well as modern revivals.

ENGL 5310 British Drama: 1580-1642
[3 credit hours]
A study of early British drama exclusive of Shakespeare, with particular attention to Elizabethan drama and its background.

ENGL 5340 Modern and Contemporary Drama
[3 credit hours]
Drama in English or translation from the late nineteenth century to the present.
Term Offered: Spring, Fall

ENGL 5410 Old And Middle English Literature
[3 credit hours]
Study of Old and Middle English Literature, using translations where necessary, with emphasis on major works and genres, cultural, philosophical, and historical contexts and backgrounds.
Term Offered: Spring, Fall

ENGL 5420 Renaissance Literature
[3 credit hours]
Study of major authors, genres, and ideas of the English Renaissance. Individual sections may focus on more specific topics.
Term Offered: Spring, Fall

ENGL 5440 Early 17th Century English Literature
[3 credit hours]
Early and mid-17th Century texts, primarily non-dramatic. Including such authors as Milton, Donne, Jonson, Lanyer, Herrick, Wroth, Herbert, Pulter, Marvell, Bacon, Hobbes, Philips, Browne, Cavendish, and others.
Term Offered: Spring, Fall

ENGL 5500 British Literature: The Romantic Period
[3 credit hours]
Study of major authors and genres of the Romantic period: approximately 1789 to 1837.
Term Offered: Spring, Fall

ENGL 5540 British Literature: The 20th and 21st Centuries
[3 credit hours]
Study of major authors, genres, and ideas of 20th-century and 21st-century British literature.

ENGL 5550 Literature of the British Empire, Beginnings to 1850
[3 credit hours]
Study of the development of race, empire, and colonialism through literary texts written in (or translated into) English from the late-thirteenth century to the abolition of the British slave trade in the early-nineteenth.
Term Offered: Spring, Fall

ENGL 5560 Literature of the British Empire 1850 to The Present
[3 credit hours]
Studies in texts from Britain and its former colonies. Genres may include the novel, travel writing, memoir, and film. Recommended: ENGL 2800 or 3790
Term Offered: Spring, Fall

ENGL 5610 Nineteenth-Century Latino Literature
[3 credit hours]
This course examines the cultural production of Latino peoples in the nineteenth century U.S., the social and cultural impact of colonization in the Southwestern part of the U.S and the Atlantic world, identity formation among Hispanophone Black, Indigenous, and people of color (BIPOC), and what Latinidad looked like in the nineteenth century.
Term Offered: Spring, Fall

ENGL 5620 American Literary Romanticism
[3 credit hours]
American literature from 1798 to 1865, from the beginnings of Romanticism in Bryant and Cooper through the Transcendental movement, with emphasis on Hawthorne, Melville, Stowe and Douglass.
Term Offered: Spring, Fall

ENGL 5630 American Literary Realism
[3 credit hours]
American literature from the post-Civil War period to the early 20th century: some emphasis on naturalism and humor; such writers as Twain, James, Howells, Dreiser and Wharton.
Term Offered: Fall

ENGL 5640 Early 20th Century American Literature
[3 credit hours]
Study of American literature from 1900 to World War II, focusing on literary modernism and its social, political and philosophical contexts.
Term Offered: Spring, Fall

ENGL 5650 African American Writing Before The 20th Century
[3 credit hours]
Study of African American prose, poetry, drama and fiction from 1760 to 1915.
Term Offered: Spring, Fall

ENGL 5660 African American Literature In The 20th and 21st Century
[3 credit hours]
A course focused on 20th and 21st century African American poetry, fiction, nonfiction, and drama.
Term Offered: Spring, Summer, Fall

ENGL 5670 Asian American Literature
[3 credit hours]
A study of the diverse traditions and key debates in Asian American and Transpacific literature.
Term Offered: Spring, Fall

ENGL 5680 American Literature Since World War II
[3 credit hours]
Major trends in postwar American literature, including traditional and uncanonical writers. Emphasis may be on poetry or prose by instructor's option.
Term Offered: Spring, Fall

ENGL 5750 History Of Literary Criticism
[3 credit hours]
A chronological examination of literary criticism, analyzing the variety of claims and practices which contribute to the current frameworks used to interpret and analyze literary texts.
Term Offered: Spring, Fall

ENGL 5780 Contemporary Literary Theories And Criticism
[3 credit hours]
An intensive examination of contemporary literary theories and criticism, focusing on selected issues and on representative theorists and critics.
Term Offered: Spring

ENGL 5790 Approaches To Research In English
[3 credit hours]
An introduction to the discipline(s) of English, the methods and resources of scholarship in the field.
Term Offered: Fall

ENGL 5800 Chaucer
[3 credit hours]
A study of Chaucer¿s major works and historical contexts, with emphasis on either Troilus and Criseyde and the dream visions, or on The Canterbury Tales in their entirety.
Term Offered: Spring, Fall

ENGL 5810 Shakespeare
[3 credit hours]
A study of Shakespeare's plays with emphasis on his development as a dramatist and with readings in major Shakespearean criticism.
Term Offered: Spring, Fall

ENGL 5820 Milton
[3 credit hours]
A study of the poetry and selected prose. Particular attention is given to biography and criticism.
Term Offered: Spring, Fall

ENGL 5850 Studies In The Work Of A British Author
[3 credit hours]
Author changes with each offering. Consult Time Schedules for authors to be studied.
Term Offered: Spring, Fall

ENGL 5860 Studies In The Work Of An American Author
[3 credit hours]
Author changes with each offering. Consult Time Schedules for authors to be studied.
Term Offered: Spring, Fall

ENGL 5980 Special Topics
[3 credit hours]
Consideration of a special topic in literature and language.
Term Offered: Spring, Fall

ENGL 6010 Teaching College Composition
[3 credit hours]
For prospective college instructors of composition. Includes supervised teaching of composition. Graded S/U only.
Term Offered: Fall

ENGL 6180 Research Methods in Writing Studies
[3 credit hours]
Students will learn and practice research methods commonly used in writing studies, including but not limited to rhetorical analysis, discourse analysis, case studies, and ethnographic research methodologies, to write a substantial research proposal. Time will also be devoted to address how research methods are used in classroom settings.
Term Offered: Fall

ENGL 6190 Environments For Esl Learning
[3 credit hours]
In the course, students learn how to identify English as a Second Language learners' linguistic needs and to design and evaluate environments for ESL learning.
Prerequisites: ENGL 3150 with a minimum grade of D- or ENGL 5150 with a minimum grade of D- or ENGL 7150 with a minimum grade of D- or LING 3150 with a minimum grade of D- or LING 5150 with a minimum grade of D- or LING 7150 with a minimum grade of D-
Term Offered: Fall

ENGL 6410 Seminar: Studies In Early English Literature
[3 credit hours]
Seminar on a specialized topic in Old and/or Middle English literature.
Term Offered: Spring, Fall

ENGL 6420 Seminar: Studies In English Renaissance Literature
[3 credit hours]
Seminar on a specialized topic in English Renaissance literature.

ENGL 6440 Seminar: Studies In Early 17th Century Literature
[3 credit hours]
Seminar on a specialized topic in early 17th century English literature.
Term Offered: Fall

ENGL 6500 Seminar: Studies In British Romantic Literature
[3 credit hours]
Seminar on a specialized topic in British Romantic literature.

ENGL 6520 Seminar: Studies In Victorian Literature
[3 credit hours]
Seminar on a specialized topic in Victorian literature.
Term Offered: Spring, Fall

ENGL 6620 Seminar: Studies In American Literary Romanticism
[3 credit hours]
Seminar on a specialized topic in American literary Romanticism.

ENGL 6630 Seminar: Studies In American Literary Realism
[3 credit hours]
Seminar on a specialized topic in American literary realism.

ENGL 6640 Seminar: Studies In 20th Century American Literature
[3 credit hours]
Seminar on a specialized topic in 20th century American literature.
Term Offered: Spring, Fall

ENGL 6890 Certificate Capstone
[3 credit hours]
This course completes the certificate program. Students will fulfill research on writing piloted in ENGL 6180, culminating in a research essay that will be submitted for publication to an appropriate scholarly journal.
Prerequisites: (ENGL 5090 with a minimum grade of D- and ENGL 5780 with a minimum grade of D- and ENGL 6010 with a minimum grade of D- and ENGL 6180 with a minimum grade of D-)
Term Offered: Spring, Summer, Fall

ENGL 6940 Internship in English as a Second Language
[2 credit hours]
Supervised practice teaching in the form of a community-service internship in English as a Second Language. Must be taken twice with different content. Graded S/U only.
Term Offered: Spring, Fall

ENGL 6960 Master's Research
[1-3 credit hours]
Research on, and writing of the master's paper or thesis.
Term Offered: Spring, Summer, Fall

ENGL 6970 Master's Thesis
[1-3 credit hours]
Research on and writing of the master's thesis in the concentration in English as a Second Language.
Term Offered: Spring, Summer, Fall

ENGL 6980 Seminar: Literary Types And Special Topics
[3 credit hours]
Seminar on a specialized topic in English studies.
Term Offered: Spring, Summer, Fall

ENGL 6990 Independent Study
[1-3 credit hours]
By permission of department; may be repeated for additional credit.
Term Offered: Spring, Summer, Fall

ENGL 8990 Independent Study
[1-3 credit hours]
By permission of department; may be repeated for additional credit.
Term Offered: Spring, Fall

Graduate Certificate in the Teaching of Writing

Application

Those applying for both the M.A. in English and the certificate in the teaching of writing program should submit application materials for each to the College of Graduate Studies.

Those applying to work on the certificate alone must hold an undergraduate degree in English and submit an application form, a letter of interest, all college and graduate school transcripts, and two letters of recommendation to the College of Graduate Studies.

A certificate in the teaching of writing can be earned as part of the master's degree in English (either literature or Writing Studies concentration). The certificate also can be earned separately from the degree.

The certificate is designed to offer continuing education for regional high school teachers of English and composition; to offer specialized education in composition to those earning master's degrees who wish to pursue work as teachers of writing at regional community colleges and area universities; and to provide graduate students with the opportunity to earn job credentials in composition, as well as in literature.

Fifteen hours of course work are required for completion of the certificate:

Code	Title	Hours
Theory		
ENGL 5780	Contemporary Literary Theories And Criticism	3
ENGL 5090	Current Writing Theory	3
Praxis		
ENGL 6010	Teaching College Composition [1]	3
Methods		
ENGL 6180	Research Methods in Writing Studies	3
Research		
ENGL 6890	Certificate Capstone	3
Total Hours		**15**

[1] This course assumes experience in teaching. Those not presently teaching will be asked to work with a teacher to gain that experience.

Those students working on the master's degree also must fulfill all requirements of that degree.

No transfer of credits from other institutions will be allowed, although those students who complete ENGL 4090 while undergraduates at The University of Toledo will not be required to take ENGL 5090 if they received a grade of B or higher.

Department of Geography and Planning

Patrick Lawrence, Chair

Neil Reid, M.A. Program Director and M.A. Graduate Advisor

Degrees Offered

- Graduate Certificate in GIS and Applied Geography (p. 334)
- Graduate Certificate in Urban and Regional Planning (p. 334)
- M.A. in Geography (p. 335)

GEPL 5040 Geography Education Strategies
[3 credit hours]
Graduate level preparation for K - 12 educators with geography specialization. Integrates social studies and standard geography curricula in response to state and federal mandates.
Term Offered: Fall

GEPL 5110 Geographic Information Systems
[3 credit hours]
Introduction to computerized methods for the capture, storage, management, analysis and display of spatially-referenced data for the solution of planning, management and research problems.
Term Offered: Spring, Summer, Fall

GEPL 5160 Patterns Of World Development
[3 credit hours]
Examination of contemporary global economic patterns and trends. Topics receiving special attention include population problems, the spread of multinational corporations, and the causes and consequences of the emergence of postindustrial economics.
Term Offered: Fall

GEPL 5180 Geographic Information Systems Applications
[3 credit hours]
Advanced applications in geographic information systems (GIS) with an emphasis on advanced GIS analysis techniques, Global Positioning System applications in GIS, database design, and a survey of vector- and raster-based GIS software and databases. Research project required.
Prerequisites: GEPL 5110 with a minimum grade of D- or GEPL 4110 with a minimum grade of D-
Term Offered: Spring

GEPL 5210 Land Use Planning
[3 credit hours]
A broad review of urban and regional planning in the US and Western Europe, introducing land use planning concepts and practices and their role in shaping the direction of urban development.
Term Offered: Spring

GEPL 5300 GIS Programming
[3 credit hours]
Introduction to computer programming languages that can customize and expand the capability of geospatial science and technology (GIS&T). Major topics include programming fundamentals, Python, ArcPy, Jupyter, and their applications.
Prerequisites: GEPL 2020 with a minimum grade of D- and GEPL 4110 with a minimum grade of D-
Term Offered: Spring

GEPL 5310 Geography of Gypsies (Romanies) and Travelers
[3 credit hours]
Explorations into identities and distributions of Gypsies (Romanies) and Travelers (GR&T peoples) worldwide and the challenges that their study presents to Geography and to other social science desciplines.
Term Offered: Spring, Summer, Fall

GEPL 5400 GeoAI and Machine Learning
[3 credit hours]
Introduction to the concepts, principles, methods, and tools of artificial intelligence (AI), machine learning (ML), and deep learning (DL) in the geosciences. As an advanced GIS&T programming course, this course exhibits wide applications and promising potentials of AI, ML, and DL in solving real-world problems.
Prerequisites: GEPL 4110 with a minimum grade of D- and GEPL 4300 with a minimum grade of D-
Term Offered: Fall

GEPL 5420 Quantitative Methods in Geographic Research
[3 credit hours]
An examination of quantitative methods commonly used in geographic research with an emphasis on spatial statistics and cartographic analysis.
Term Offered: Fall

GEPL 5490 Remote Sensing Of The Environment
[3 credit hours]
Introduction to theory, methods and techniques used to gather and analyze remote sensor data. Topics range from low altitude air photo interpretation through satellite image acquisition. Recommended: GEPL 3550.
Term Offered: Fall

GEPL 5500 Digital Image Analysis
[3 credit hours]
Using imagery captured by earth orbiting satellites, students will document changes on the surface of the earth addressing environmental issues. Students will have the opportunity to learn applications of this technology including project based work in the classroom.
Prerequisites: GEPL 4490 with a minimum grade of D- or EEES 4490 with a minimum grade of D- or GEPL 5490 with a minimum grade of C or EEES 5490 with a minimum grade of C
Term Offered: Spring

GEPL 5520 Analytical And Computer Cartography
[3 credit hours]
The theoretical and mathematical foundations of the mapping process in a digital environment. An introduction to the structure and manipulation of graphic and nongraphic geographical data to produce maps.
Prerequisites: GEPL 4110 with a minimum grade of D- and GEPL 5110 with a minimum grade of C
Term Offered: Spring

GEPL 5530 Principles Of Urban Planning
[3 credit hours]
Elaborations on planning theory. The planner's role in land use regulation, economic development, housing and social service delivery is reviewed.
Term Offered: Fall

GEPL 5540 Weather And Climate
[3 credit hours]
Survey analysis of meteorology and climatology. The physical processes of weather and the pattern of climate provide the basis for this course.
Term Offered: Summer, Fall

GEPL 5570 Land Development And Planning
[4 credit hours]
The exploration of theoretical location analysis, pragmatic land development issues and analytic feasibility tools, and the consequences of land use policies that affect development.
Term Offered: Spring

GEPL 5580 Location Analysis
[4 credit hours]
The application of geographic location theory, spatial interaction modeling, optimization techniques and geographic information system processing to the solution of facility location problems.
Prerequisites: GEPL 5570 with a minimum grade of D-
Term Offered: Spring

GEPL 5600 Urban Design
[3 credit hours]
Concepts and procedures for the organization, design and development of public and private urban forms and spaces at the micro-level, including a survey of intraurban elements, cultural, ecological and aesthetic considerations, historic preservation, and interdisciplinary collaboration. Research project required.
Term Offered: Fall

GEPL 5650 Geography of Earth Systems
[3 credit hours]
Using an Earth System Science approach linking the hydrosphere, biosphere, atmosphere, and lithosphere, students will explorer the relationship and spatial characteristics of events such as hurricane landfall, volcanic eruptions and climate change.
Term Offered: Spring

GEPL 5700 Community Planning Workshop
[3 credit hours]
This course introduces the skills and techniques used by practitioners in the planning process. Assignments will focus on the collection, analysis and communication of information by following community planning approaches.
Term Offered: Spring

GEPL 5710 Urban Geography
[3 credit hours]
Geographic perspectives on the social, political and economic functions of cities. Issues of land use, redevelopment, residential and commercial geographies are examined in contemporary North American cities.
Term Offered: Spring, Fall

GEPL 5750 Transportation Geography
[3 credit hours]
The role of transportation and communication in the economic development of places. Theories of geographic interaction, location of transport routes and the developmental implications of transport investments are explored.
Term Offered: Spring, Fall

GEPL 5800 Geospatial Science Research
[3 credit hours]
A seminar/capstone course to guide students in integrating Geographic Information Science and Technology (GIS&T) knowledge, exploring research questions, conducting research projects, and composing journal-standard articles.
Prerequisites: GEPL 4110 with a minimum grade of D- and GEPL 4300 with a minimum grade of D- and GEPL 4400 with a minimum grade of D-
Term Offered: Spring

GEPL 5810 Political Geography
[3 credit hours]
Space and place facets of population size, growth, migration, distribution and composition with emphasis on the population trends and patterns in both developing and developed nations.
Term Offered: Spring, Fall

GEPL 5910 Directed Research
[1-3 credit hours]

GEPL 5920 Readings in Geography
[1-3 credit hours]

GEPL 6100 Philosophy & General Methodology
[3 credit hours]
Past and current trends in geographic thought and related methodological implications, with elaborations by current faculty members.
Term Offered: Fall

GEPL 6150 Seminar In Research Methods
[3 credit hours]
A computer-based course in geographic research methodology. The course includes an introduction to research design, data measurement, spatial sampling and multivariate approaches to the study of areal networks and spatial distributions.
Term Offered: Spring, Fall

GEPL 6530 Seminar-Urban/Regional Planning Applications
[3 credit hours]
The course applies forecasting and projection techniques to urban and regional problems. Population, economic base, land use, retail and fiscal impact analyses are examined.

GEPL 6550 Seminar In Environment Planning
[3 credit hours]
Intensive group study of major goals and methodologies of environmental planning. Major emphasis is placed upon individual student research projects oriented toward specific environmental planning problems.

GEPL 6700 Teaching Practicum In Geography
[1-6 credit hours]
Methods of teaching geography in a university of college setting. Supervision of labs or discussion.
Term Offered: Spring, Summer, Fall

GEPL 6890 Professional Development in Geography and Planning
[3 credit hours]
Study of professional practices, knowledge, and skills required for pursuing opportunities in the public or private sector in geography and planning, including important issues of considering career planning, networking, ethics, writing and publishing.
Term Offered: Spring

GEPL 6910 Comprehensive Exam Preparation
[2 credit hours]
The course is used for the completion of the comprehensive exam requuirement for M.A candidates.
Prerequisites: (GEPL 6100 with a minimum grade of D- and GEPL 6150 with a minimum grade of D-)
Term Offered: Spring, Fall

GEPL 6920 Research Design
[3 credit hours]
The course will have students prepare all the main components of a thesis proposal leading to the completion presentation of the proposal to their thesis advisory committee.
Term Offered: Spring

GEPL 6930 General Seminar
[3 credit hours]

GEPL 6940 Internship In Planning
[1-6 credit hours]
Professional work experience with a Greater Toledo planning organization related to academic education.
Term Offered: Spring, Summer, Fall

GEPL 6950 Applied Geographic Workshop
[3 credit hours]
Capstone course for GIS/Applied Geographics certificate program to provide hands-on experience in applying GIS, remote sensing and desktop mapping systems to spatially-oriented problems that are unique to their individual disciplines.
Term Offered: Spring, Fall

GEPL 6960 Thesis
[1-6 credit hours]
Work on a thesis is the culmination of graduate education and occupies most of the second year.
Term Offered: Spring, Summer, Fall

Graduate Certificate in GIS and Applied Geography

Requirements for Completion

Students enrolled full-time can complete the requirements for this 12-credit program in one year. Students admitted into the program for the fall semester should be able to enroll in all the necessary courses within the academic year and can complete their final project by the end of the spring semester.

Specific Requirements

- Students enrolling in the program will be required to complete GEPL 5110 and GEPL 6950 (6 credits).
- Students must complete 6 credits from the electives list.
- Students must maintain a minimum "B" average to complete the certificate program.
- Course selection and the sequence of courses will be agreed upon by the student and the program coordinator to help students complete the program and gain the necessary skills.

Course List

Code	Title	Hours
GEPL 5110	Geographic Information Systems	3
GEPL 6950	Applied Geographic Workshop	3
Select a minimum of 6 credits of the following:		6
GEPL 5180	Geographic Information Systems Applications	
GEPL 5490	Remote Sensing Of The Environment	
GEPL 5500	Digital Image Analysis	
Total Hours		**12**

- PLO 1: Apply and demonstrate the principles of geographic information science
- PLO 2: Formulate requirements and constraints in spatial analysis
- PLO 3: Complete spatial analysis with selected GIS software packages
- PLO 4: Develop skills for designing and implementing real-world GIS applications
- PLO 5: Gain hands-on experience with popular GIS software such as ArcGIS
- PLO 6: Learn how to communicate effectively via mapping and graphic presentation
- PLO 7: Apply GIS technology to evaluate real-world problems, and communicate the GIS project process and results in written and graphic media at a professional level.
- PLO 8: Draw upon the underlying theory behind GIS technology (including projections and spatial databases) to optimize application of the technology and extend it into new areas.
- PLO 9: Understand the spatial aspects of an external client s GIS needs and develop a practical project plan for addressing those needs
- PLO 10: Design, compile, and develop a spatial database and a set of analytical tools into a system appropriate to the problem
- PLO 11: Demonstrate a mastery of geographic analysis and cartographic skills

Graduate Certificate in Urban and Regional Planning

Code	Title	Hours
GEPL 5530	Principles Of Urban Planning	3
GEPL 5700	Community Planning Workshop	3
Choose 6 hrs from the following:		6
PSC 5320	Urban Policy & Administration	
PSC 6430	Public Policy Process	
GEPL 5110	Geographic Information Systems	
GEPL 5180	Geographic Information Systems Applications	
GEPL 5210	Land Use Planning	
GEPL 5710	Urban Geography	
GEPL 5750	Transportation Geography	
GEPL 6530	Seminar-Urban/Regional Planning Applications	

GEPL 6550	Seminar In Environment Planning	
Total Hours		**12**

- PLO 1: Gain a broad understanding of the discipline and practice of urban and regional planning
- PLO 2: Understand important approaches and tools underlying urban and regional planning
- PLO 3: Apply planning ideas and tools to real-world cases
- PLO 4: Demonstrate skills necessary to be an effective urban planning professional

M.A. in Geography

The master's program is designed to provide a quality multidisciplinary education, foster theoretical and applied research in geography and planning, promote multicultural understanding, complement interdisciplinary work, and support local community outreach programs and grass-roots organizations. Faculty interests and research facilities offer opportunities to pursue intensive programs in community and urban planning, economic geography, geographic information science, environmental geography and planning, or cultural and behavioral geography.

For the Master of Arts degree, students must meet the following departmental requirements, including 30 credit hours of graduate work:

1. 6 of the 30 minimum hours must be taken at the 6000 level. The following courses are mandatory:

Code	Title	Hours
GEPL 6100	Philosophy & General Methodology	3
GEPL 6150	Seminar In Research Methods	3

2. 3 of the 30 minimum hours, approved by the adviser, must be taken in a related area outside the department. This may not include an independent study or research course.
3. The selection of geography courses and related courses should comprise a unified program chosen in consultation with the graduate adviser.
4. The student is required to complete research and write an approved thesis under the direction of a thesis advisory committee composed of departmental faculty members.
5. Upon completion of the thesis, an oral examination on the student's thesis research, as it relates to general professional competence, will be required.
6. A minimum enrollment to qualify for the master's degree is 3 hours of thesis credits, but there may be as many as 9 hours within the 30 semester hours of graduate work.

Non-Thesis Option

For students who do not plan to seek additional graduate education beyond the MA degree, the department offers a non-thesis for the MA in Geography. This option includes a general exam and a major research paper completed in the context of GEPL 6890 during the Student's final spring semester in the program.

Code	Title	Hours
Minimum of 30 credit hours of graduate course work.		
GEPL 6100	Philosophy & General Methodology	3
GEPL 5110	Geographic Information Systems	3
GEPL 5530	Principles Of Urban Planning	3
GEPL 6150	Seminar In Research Methods	3
GEPL 5180	Geographic Information Systems Applications	3
GEPL 6890	Professional Development in Geography and Planning	3
Select one of the following:		3
GEPL 5650	Geography of Earth Systems	
GEPL 5750	Transportation Geography	
GEPL 5700	Community Planning Workshop	
6 additional hours at the 5000 or 6000 level in Geography.		6
Minimum of 3 credit hours of graduate level course taken in a related field out of the department		3
Total Hours		**30**

Combined bachelor's to master's- Geography pipeline program

Undergraduate students from the BA Geography, BA Data Analytics or BA Environmental Studies programs accepted to the **Combined bachelor's to master's- Geography pipeline program** option will be admitted to the **MA Geography program** and allowed to complete up to three graduate level classes (9 credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. **Students must have a cumulative higher education GPA of 3.0 to be accepted into this pipeline program.** They will then continue into the graduate program upon completion of their undergraduate degree requirements. The graduate coursework (up to 9 credit hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of 9 credit hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) **GEPL 5110, GEPL 5180, GEPL 5490, GEPL 5500, GEPL5530, GEPL 5650, GEPL 5700, GEPL 5750** may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

- 1. Students will be able to describe the basic epistemological, ontological and political issues related to philosophy of knowledge that are significant to the training of academic geographers (and planners) at the MA level.
- 2. Students will identify issues in academic geography (and planning), their impact on the discipline, and their implications for future growth of the discipline.

- 3. Students will describe landmark events in the history of (Western) geographic (and planning) thought over the past 100 years.
- 4. Students will be able to analyze the major traditions and approaches in the history of geography (and planning).
- 5. Students will be able to generate examples of major figures in the "pantheon of heroes" of academic geography (and planning) emphasizing the past 100 years in Europe and the Americas.
- 6. Students will be able to detect and distinguish for purposes of discussion the philosophical and methodological predilections of current GEPL faculty.
- 7. Students will state the necessary and sufficient working vocabulary for discussing philosophical and methodological issues with others, including non-geographers (academics and non-academics).
- 8. Students will be able to generate examples of career opportunities for geographers and planners in relation to the educational experience in the UT GEPL MA Program.
- 9. Students will be able to create and critique conceptual or graphic models related to their chosen research areas and develop and critique basic statistical models or mathematical models.
- 10. Students will be able to articulate their understanding of the complicated relationship between research questions and research methods in the fields of geography and planning typically be identifying appropriate research methods for a given set of research questions.
- 12. Students will understand some of the special challenges in working with spatial data including issues of spatial dependence, spatial aggregation at different scales and the modifiable areal unit problem.

Department of History

Ami Pflugrad-Jackisch, Chair
Kristen Geaman, Director of Graduate Studies

The Graduate Program in History at The University of Toledo is committed, first and foremost, to the values and priorities of liberal arts education: fostering critical analysis and the skills of written and oral communication; the pursuit of knowledge as an organic and expansive universe of possibilities; a respect for diversity and difference, including difference of opinion; and the continuing relevance of the humanities as the search for and understanding of the human experience. Graduates from the history program have gone on to successful careers in academia, the private sector, and public venues such as museums and historical societies.

Degrees Offered

- M.A. in History (p. 337)
- PhD in History (p. 338)

HIST 5110 Sports, Race, and Power in Apartheid South Africa
[3 credit hours]
The class aims to interrogate the ways in which politics of sports, race and power, as well as resistance, intersected during the Apartheid era in South Africa, and what the legacies thereof are.
Term Offered: Spring, Fall
Multicultural Non-US Diversity

HIST 5200 Colonial Foundations Of The U.s.
[3 credit hours]
This course analyzes the colonial experience of the United States prior to 1763. It stresses the various cultures and social groups in America and how they related with one another.

HIST 5270 20th Century America, 1920-1945
[3 credit hours]
Social, political and economic development of the United States, 1920-1945. The Republican ascendancy, the car culture, Great Depression, New Deal and World War II.
Term Offered: Fall

HIST 5280 U.s. Since 1945: Affluence And Anxiety
[3 credit hours]
Social, economic and political development of the United States since 1945. The Cold War, McCarthyism, Eisenhower Equilibrium, the New Frontier and the Great Society, civil rights, Watergate and the Reagan Revolution.
Term Offered: Fall

HIST 5360 American Intellectual History I
[3 credit hours]
Development and influence of major ideas from the colonial period to 1865. Topics include Puritanism, the Enlightenment, Democracy and Transcendentalism.
Term Offered: Spring

HIST 5450 United States and Latin America
[3 credit hours]

HIST 5470 Mexico
[3 credit hours]
Mexican history from pre-Hispanic times to the present. Emphasis on the political, social and economic changes imposed by the Spaniards; the legacy of colonialism on the modern nation; the Mexican Revolution and the "Mexican Miracle."
Term Offered: Summer, Fall

HIST 5490 Witchcraft And Magic In Medieval And Early Modern Europe
[3 credit hours]
Witchcraft, religion and magic in western Europe from the 12th through 17th centuries, focusing on the origins of witchcraft belief, diabolical magic, the witchcraze and its decline.
Term Offered: Spring, Fall

HIST 5740 Modern Japanese History
[3 credit hours]
Japan in transition under Western influence, forces leading to the Meiji Restoration, the modernization of Japan, Japan's rise as a world power, war and postwar developments.
Term Offered: Spring, Fall
Multicultural Non-US Diversity

HIST 5980 Special Topics
[1-4 credit hours]
Topics selected by various instructors.
Term Offered: Spring, Fall

HIST 6600 Historiography
[3 credit hours]
The nature of historical writing. Concepts of the historical method. The history of the writing of history from the beginning to the present.
Term Offered: Spring, Fall

HIST 6930 Seminar
[3 credit hours]
Focus on primary research and writing in various fields: 01: 17th and 18th century America, 05: 19th century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 15: 20th century America, 16: Public History, 17: U. S. Bibliography to 1865, 18: U. S. Bibliography since 1865, 35: Latin America, 39: Ancient, 40: Medieval Europe, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Africa, 90: Special Topics
Term Offered: Spring, Fall

HIST 6950 Workshops
[3 credit hours]
Introduction to essential pedagogical and academic skills including survey class design: syllabi, lectures, history writing, theses and prospectuses. And professional skills: constructing a CV, letter of introduction, teaching philosophy, and grant proposals.
Term Offered: Fall

HIST 6960 Thesis
[1-16 credit hours]
M.A. thesis topic to be selected by the student with the approval of the thesis adviser.
Term Offered: Spring, Summer, Fall

HIST 6990 Independent Study
[1-4 credit hours]
Readings: 01: 17th and 18th Century America, 05: 19th Century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 13: Public History, 15: 20th Century America, 16: Business, 17: Peace Movements, 18: Social, 35: Latin America, 40: Medieval Europe, 41: Renaissance and Reformation, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Ancient Greece, 90: Ancient Rome, 92: Africa, 99: Any Title
Term Offered: Spring, Summer, Fall

HIST 8600 Historiography
[3 credit hours]
The nature of historical writing. Concepts of the historical method. The history of the writing of history from the beginning to the present.
Term Offered: Spring, Fall

HIST 8930 Seminar
[3 credit hours]
Focus on primary research and writing in various fields: 01: 17th and 18th century America, 05: 19th century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 15: 20th century America, 16: Public History, 17: U. S. Bibliography to 1865, 18: U. S. Bibliography since 1865, 35: Latin America, 39: Ancient, 40: Medieval Europe, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Africa, 90: Special Topics
Term Offered: Spring, Fall

HIST 8950 Workshops
[3 credit hours]
Introduction to essential pedagogical and academic skills including survey class design: syllabi, lectures, history writing, theses and prospectuses. And professional skills: constructing a CV, letter of introduction, teaching philosophy, and grant proposals.
Term Offered: Fall

HIST 8960 Dissertation
[1-16 credit hours]
Ph.D. dissertation topic to be selected by the student with the approval of the dissertation adviser.
Term Offered: Spring, Summer, Fall

HIST 8990 Independent Study
[1-4 credit hours]
Readings: 01: 17th and 18th Century America, 05: 19th Century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 13: Public History, 15: 20th Century America, 16: Business, 17: Peace Movements, 18: Social, 35: Latin America, 40: Medieval Europe, 41: Renaissance and Reformation, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Ancient Greece, 90: Ancient Rome, 92: Africa, 99: Any Title
Term Offered: Spring, Summer, Fall

M.A. in History

All students seeking admission to graduate study are required to provide a cover letter, transcripts, three academic letters of recommendation, a writing sample, and a statement of research interests. The applicant's research interests should correlate to the expertise of the history department faculty. In addition, students whose native language is not English must submit TOEFL scores. For additional information, see the History Department's graduate handbook, the departmental website, or contact the director of graduate studies.

The History program reviews applications in February for students to begin studies during the fall semester. The deadline for applications for admission with financial aid is January 30th. However, the College of Graduate Studies accepts applications throughout the year.

The student may earn the M.A. degree on a thesis or non-thesis track by completing either 30 graduate credits plus an additional 6 hours in thesis credits; or 36 graduate credits with an examination at the end of the second year of study. The choice between the two options should be made no later than the second semester of study. The student must

maintain a B average, or better, in all graduate work. Each candidate for the M.A. degree must pass the following courses.

Code	Title	Hours
HIST 6600	Historiography	3
HIST 6930	Seminar (Two seminars with this course number)	3
HIST 6950	Workshops (Highly recommended)	3

- PLO 1: Analyze current historical literature in chosen field of study.
- PLO 2: Compose a clear historical argument supported by adequate evidence.
- PLO 3: Develop aptitude with electronic research tools and source investigation (such as archival investigation and location of primary sources).
- PLO 4: Write according to disciplinary standards.

PhD in History

All students seeking admission to graduate study are required to provide a cover letter, transcripts, three academic letters of recommendation, a writing sample, and a statement of research interests. The applicant's research interests should correlate to the expertise of the history department faculty. In addition, students whose native language is not English must submit TOEFL scores. For additional information, see the History Department's graduate handbook, the departmental website, or contact the director of graduate studies.

The History program reviews applications in February for students to begin studies during the fall semester. The deadline for applications for admission with financial aid is January 30th. However, the College of Graduate Studies accepts applications throughout the year.

The doctoral degree in history requires a minimum of 62 hours beyond the master's degree, or 90 hours for students admitted without a qualified master's degree, including 24 hours for the dissertation. Doctoral students must complete four seminars, and the following course in historiography, and a Professional Workshop.

Code	Title	Hours
HIST 8600	Historiography	3
HIST 8950	Workshops	3

General Field

The student must stand for an examination, written and oral, over one general field, such as U.S. history or modern European history. See the departmental Graduate Handbook for additional details.

Secondary Concentration

The student must stand for examination in one major area of concentration. This normally will be the area in which the student will write the dissertation and in which the student has completed seminars and course work.

Minor Field

The student will be examined in a minor area outside the general field. Selection of this field will be made by the student in consultation with the advisor.

Foreign Language Competency

Every student, before taking the comprehensive examination, must pass an examination in a foreign language. The choice of the language required will lie with the student's advisor.

- PLO 1. Evaluate current historical literature in chosen field of study.
- PLO 2. Compose a clear historical argument supported by adequate evidence.
- PLO 3. Develop aptitude with electronic research tools and source investigation (such as archival investigation and location of primary sources).
- PLO 4. Write according to disciplinary standards.
- PLO 5. Discover new sources, new information from sources, and use new methodologies that lead to new contributions.
- PLO 6. Create an original contribution and argument.

Department of Music

Jason Stumbo, Chair

MUS 5010 University Band
[1 credit hour]
The Rocket Marching Band appears at all home football games during the fall semester. Any UT student with previous experience may participate. Contact the instructor for audition information.
Term Offered: Spring, Fall

MUS 5020 Jazz Ensemble
[1 credit hour]
Students rehearse and perform a diverse repertoire for large jazz ensemble. Open to all students by audition in the first week of each semester and/or permisison of instructor.
Term Offered: Spring, Fall

MUS 5040 University Wind Ensemble
[1 credit hour]
Open to a limited number of qualified students.

MUS 5050 Chamber Music Ensembles
[1 credit hour]
The study and performance of chamber music literature in classical or jazz styles. Groups are determined by audition at the beginning of each semester, and are open to a limited number of qualified students upon sufficient demand and with the permission of the instructor.
Term Offered: Spring, Fall

MUS 5060 Symphonic Band
[1 credit hour]
Students rehearse and perform a diverse concert band repertoire. Open to all students through audition or permission of instructor.
Term Offered: Spring, Fall

MUS 5070 Varsity Band
[1 credit hour]
Students rehearse and perform a diverse athletic band repertoire. Open to all students through audition or permission of instructor.
Term Offered: Spring, Fall

MUS 5090 University Orchestra
[1 credit hour]
Open to any qualified student.
Term Offered: Spring, Fall

MUS 5130 University Chorus
[1 credit hour]
This non-auditioned mixed (SATB) choral ensemble is open to any student. Performing music in a variety of styles, this ensemble places a primary focus on developing musicianship and basic vocal technique.
Term Offered: Spring, Fall

MUS 5140 Concert Chorale
[1 credit hour]
This auditioned mixed (SATB) choral ensemble is the premiere choral ensemble at the University of Toledo. With a focus on advanced vocal techniques and performance, this ensemble requires an audition and instructor approval.
Term Offered: Spring, Fall

MUS 5150 Jazz Vocalstra
[1 credit hour]
Students rehearse and perform traditional vocal jazz literature. Open to qualified students by audition at the beginning of each semester and/or permission of instructor.
Term Offered: Spring, Fall

MUS 5160 Women's Chorus
[1 credit hour]
This non-auditioned treble voice (SSAA) choral ensemble is open to any student. Performing music in a variety of styles, this ensemble focuses on developing musicianship and basic vocal technique.
Term Offered: Spring, Fall

MUS 5180 Men's Chorus
[1 credit hour]
This non-auditioned Tenor/Bass voiced (TTBB) choral ensemble is open to any student. Performing music in a variety of styles, this ensemble focuses on developing musicianship and basic vocal technique.
Term Offered: Spring, Fall

MUS 5190 Opera Workshop
[1 credit hour]
Open to any qualified student.
Term Offered: Spring, Fall

MUS 5440 Music History And Literature: Special Topics
[3 credit hours]
The area of study will be announced at the time the course is offered.
Term Offered: Spring

MUS 5510 Choral Conducting
[2 credit hours]
Conducting techniques and rehearsal routine, especially concerned with choral groups. Opportunities to direct student choral groups.
Prerequisites: MUS 3500 with a minimum grade of C
Term Offered: Spring, Summer, Fall

MUS 5520 Instrumental Conducting
[2 credit hours]
Conducting techniques and rehearsal routine especially concerned with instrumental ensembles. Opportunities to direct student instrumental groups.
Prerequisites: MUS 3500 with a minimum grade of C
Term Offered: Spring

MUS 5590 Piano Pedagogy
[2 credit hours]
Exploration of techniques and materials for comprehensive, private and group instruction.
Term Offered: Spring, Fall

MUS 5610 Analytical Techniques
[3 credit hours]
Application of various analytical theories of music to selected works from different style periods to further the understanding of musical forms and works.
Prerequisites: MUS 3500 with a minimum grade of C
Term Offered: Fall

MUS 5630 Counterpoint: Comparison Of Styles
[3 credit hours]
A study of 16th, 18th and 20th century polyphony. Analysis of selected works and composition exercises will be the basis for comparing and contrasting these three styles.
Prerequisites: MUS 3500 with a minimum grade of C
Term Offered: Spring

MUS 5800 Applied Music
[1-2 credit hours]
Private studio music lessons intended primarily for music education graduate students or for music performance graduate students on a secondary instrument. 1 or 2 credit hours.
Term Offered: Spring, Summer, Fall

MUS 5900 Graduate Studies In Music
[3 credit hours]
The study of sources and bibliographical materials in music.
Term Offered: Fall

MUS 6000 Master's Recital
[0 credit hours]
Required for the Master of Music Performance degree. A passing grade documents successful completion of the recital requirement. Must be taken during the semester in which the recital is presented.
Corequisites: MUS 6800
Term Offered: Spring, Summer, Fall

MUS 6450 Jazz history, Style and Analysis
[3 credit hours]
An in-depth study of jazz styles, trends, performers and composers through historical and analytical research.
Term Offered: Spring

MUS 6560 Jazz Pedagogy and Conducting
[2 credit hours]
An in-depth study of jazz pedagogical materials and methods as well as rehearsal and conducting techniques.
Term Offered: Spring, Fall

MUS 6600 Jazz Composition and Arranging Seminar
[2 credit hours]
Examination and analysis of jazz scores with creative assignments in jazz orchestration and composition in traditional and contemporary styles. May be repeated one time.
Term Offered: Fall

MUS 6690 Seminar In Music Composition
[2 credit hours]
May be repeated, but maximum accumulated credit is six hours. Beginning composition, including writing in the smaller musical forms, to advanced compositions for large.
Term Offered: Spring, Fall

MUS 6700 Jazz Improvisation Seminar
[2 credit hours]
Practical application and analysis of jazz improvisation methods and techniques as applied to contemporary jazz composition and performance. May be repeated one time.
Term Offered: Spring, Fall

MUS 6800 Applied Music
[2-5 credit hours]
Private studio music lessons for music performance graduate students, including the study of performance methods and literature of the highest levels. Preparation for professional-level performance. May be repeated for credit with permission of the instructor.
Term Offered: Spring, Summer, Fall

MUS 6980 Seminar: Special Topics
[1-3 credit hours]
Selected subjects in music in areas of special interest to the advanced master's degree student. The seminar topic will be announced in the semester schedule of classes.
Term Offered: Spring, Summer, Fall

MUS 6990 Independent Study
[1-3 credit hours]
Designed to meet the needs of individual students who wish to pursue projects in the area of music.
Term Offered: Spring, Summer, Fall

Department of Philosophy and Religious Studies

Ammon Allred, Chair
Benjamin Grazzini, Graduate Adviser

The department is historically oriented and pluralistic in scope and interests. UToledo is thus an ideal place to pursue a variety of philosophical areas, including American philosophy, environmental ethics and issues surrounding sustainability, philosophy of religion, philosophy of mathematics, and medical ethics, in addition to philosophy of mind, logic, philosophy of science, epistemology, ancient philosophy, and social and political philosophy.

PHIL 5010 Islamic Law and Society
[3 credit hours]
This course will survey Islamic law in historical and comparative modern contexts. This course will provide (a) basic introduction to the sources and methods of classical Islamic legal interpretation, (b) survey of the most pressing areas in which traditional Islamic norms remain relevant today—criminal law, family law, and commercial law, (c) the challenges and transformations introduced by colonialism, modernity, and the nation-state, and (d) comparison with the American law and the constitution, highlighting comparative interpretive methods such as originalism versus progressivism, and innovative dimensions of Islamic law such as legal pluralism, wide room for local custom, religious diversity, and restorative justice.
Term Offered: Spring

PHIL 5210 Ancient Philosophy Seminar
[3 credit hours]
An intensive study of the texts and arguments of Presocratic philosophers, Plato, Aristotle, or Hellenistic philosophers. Course may be repeated as topics vary.
Term Offered: Spring, Fall

PHIL 5230 Modern Philosophy Seminar
[3 credit hours]
An intensive study of one or more Continental or British philosophers from the sixteenth through eighteenth centuries. Course may be repeated as topics vary.
Term Offered: Spring, Fall

PHIL 5240 19th Century European Philosophy
[3 credit hours]
An intensive study of European philosophy after Kant, including Hegel, Marx, Kierkegaard and Nietzsche.
Term Offered: Spring, Fall

PHIL 5250 Phenomenology
[3 credit hours]
An intensive study of major works from phenomenological philosophers, such as Husserl, Heidegger, Sartre, or Merleau-Ponty. Course may be repeated as topics and texts vary.
Term Offered: Spring, Fall

PHIL 5260 Recent European Philosophy
[3 credit hours]
An examination of texts and problems in the Frankfurt School, post-structuralism, deconstruction, post-modernism, or of such thinkers as Habermas, Foucault, Derrida and Lyotard. Course may be repeated as topics vary.
Term Offered: Spring, Fall

PHIL 5270 American Philosophy
[3 credit hours]
A study of the development of American philosophy, or of one or more of Pierce, James, Dewey, or Mead. Course may be repeated as topics vary.
Term Offered: Fall

PHIL 5280 20th Century Analytic Philosophy
[3 credit hours]
Selected readings from Frege, the Russell, Wittgenstein, the Vienna Circle, the Ordinary Language school and American neopragmatists such as Quine, Rorty and Davidson. Course may be repeated as topics vary.
Term Offered: Spring, Fall

PHIL 5300 Philosophy Of Natural Science
[3 credit hours]
A study of scientific inquiry including the structure of scientific explanations, relation of evidence and confirmation, the metaphysics of theoretical entities, and the nature of scientific change and progress.
Term Offered: Spring, Fall

PHIL 5400 Ethics Seminar
[3 credit hours]
Selected topics or philosophers in ethical theory. Course may be repeated as topics vary.
Term Offered: Spring

PHIL 5650 Philosophy Of Mind
[3 credit hours]
Advanced study of issues in the philosophy of mind such as: intentionality and misrepresentation, rationality and interpretation, supervenience and reductionism, folk psychology and eliminative materialism. Course may be repeated as topics vary.
Term Offered: Spring

PHIL 5750 Political Philosophy Seminar
[3 credit hours]
Selected topics or philosophers in political philosophy. Course may be repeated as topics vary.
Term Offered: Spring, Fall

PHIL 5920 Readings In Philosophy
[3 credit hours]
Critical inquiry into selected works of a particular philosopher or a specific philosophical problem.
Term Offered: Spring, Fall

PHIL 5990 Independent Study
[1-3 credit hours]
Directed study in philosophy under supervision of a philosophy faculty member.
Term Offered: Spring, Summer, Fall

PHIL 6000 Advanced Logic
[3 credit hours]
A study of propositional and predicate logic, as well as examination of issues in the philosophy of logic.
Term Offered: Spring, Fall

PHIL 6800 Proseminar
[1-6 credit hours]
Participation in departmental faculty-graduate student colloquia and mentoring program. Credit will carry the grade of S or U, and will not count toward credit hour requirements for the M.A. degree.
Term Offered: Spring, Fall

PHIL 6960 Thesis
[1-16 credit hours]

Department of Political Science and Public Administration

Jetsabe Caceres, Chair
Daniel Boden, Director, M.P.A. Program

The master of public administration (MPA) is a professional degree for those pursuing administrative careers in government and nonprofit organizations. The program can be done on a part-time or full-time basis. It is an appropriate degree path for recent college graduates to those in mid-career who are looking to bolster their credentials or make a career change. The required classes emphasize traditional public management concerns like human resources, budgeting, law, quantitative analysis, and policymaking. With elective courses, students may choose to specialize in municipal governance, nonprofit management, urban and regional planning, geographic information systems (GIS), data analytics, or health care policy and administration.

Degrees Offered

- Graduate Certificate in Health Care Policy and Administration (p. 343)
- Graduate Certificate in Management of Non-Profit Organizations (p. 343)
- Graduate Certificate in Municipal Administration (p. 344)
- Joint J.D./M.P.A. Degree (p. 345)
- Master of Public Administration (p. 345)

PSC 5220 Advocacy Groups in US Politics
[3 credit hours]
This course investigates the role of advocacy groups in American politics. It develops practical lobbying skills through experiential learning and covers topics such as the role of advocacy groups in campaigns and elections, grass roots mobilization, and agenda setting.
Term Offered: Spring, Fall

PSC 5230 Presidency
[3 credit hours]
The nomination, election, responsibilities and performance of the American president. The course includes decision making, policy making, personality, and relations with Congress, the Courts, news media and interest groups.
Term Offered: Spring

PSC 5280 Legislative Process
[3 credit hours]
An intensive study of the development, functions, committees, party and factional organizations of the U.S. Congress, state legislatures and non-American legislative bodies.
Term Offered: Summer, Fall

PSC 5300 Principles of Public Administration
[3 credit hours]
This course provides an overview of public administration. It addresses organization theory, decision making, budgeting, public policy, and the changing role of public institutions. It covers important democratic, professional, ethical and human values that are central to public administration.

PSC 5320 Urban Policy & Administration
[3 credit hours]
What does it take to govern a city and its environs? In this course, we examine the balance between the pressing needs of a city and the many economic and political constraints that citizens, leaders, and experts must navigate to achieve their goals.
Term Offered: Spring, Summer, Fall

PSC 5340 Environmental Policy And Administration
[3 credit hours]
Policy for air and water pollution control, hazardous wastes, nuclear wastes. Examination of EPA, Congressional committees, state and city agencies as well as some international issues.
Term Offered: Fall

PSC 5360 Ethics In Public Policy And Administration
[3 credit hours]
Examination of values and principles which guide public policy formation and public administration. Applications of philosophical concepts to policy problems and the responsibilities of public administrators will be emphasized.
Term Offered: Spring, Summer, Fall

PSC 5380 Fundraising
[3 credit hours]
This course examines the theoretical, practical and ethical issues related to public and nonprofit organizations fundraising. This course will prepare students who plan to work in public and nonprofit organizations to win and manage grants as well as philanthropic donations from multiple sources.
Term Offered: Spring, Summer, Fall

PSC 5410 Public and Nonprofit Management
[3 credit hours]
This course examines management techniques, organizational design, strategic planning and the theoretical and practical behavioral skills that are necessary for effective public and nonprofit management. These skills include communication, organizational, and leadership skills within public and nonprofit organizations.
Term Offered: Spring, Summer, Fall

PSC 5420 Political Determinants of Health
[3 credit hours]
An examination of the political determinants of health, that is, the upstream political forces and policy decisions that are the causal sources of the social conditions that lead to health inequities. This course introduces the importance of power, politics, advocacy, and policy in public health. Students will learn models of health equity and the political determinants of health and apply these to contemporary case studies with particular attention to the health effects of racism.
Term Offered: Spring, Fall
Multicultural US Diversity

PSC 5430 Human Resources Management in Public and Nonprofit Organizations
[3 credit hours]
This course is a study of human resource management in public and nonprofit organizations. The course explores broad themes within public personnel administration such as recruitment, retention, motivation, and diversity to provide students with the opportunity to develop technical skills necessary for effectively managing human resources in contemporary public agencies, including government and nonprofit organizations.
Term Offered: Spring, Summer, Fall

PSC 5440 Budgeting And Financial Administration
[3 credit hours]
An examination of the institutions and techniques of financial administration, including government accounting, budgeting, financial management and government choice.
Term Offered: Spring, Summer, Fall

PSC 5480 Introduction to Nonprofits
[3 credit hours]
This course provides an overview of the voluntary sector with an emphasis on the historical, philosophical, and theoretical justifications of the nonprofit sector, voluntary action, and philanthropy. The course will explore the administration and management of nonprofit organizations as well as the impact nonprofit organizations have on public policy.
Term Offered: Spring, Summer, Fall

PSC 5560 Law And Public Administration
[3 credit hours]
Survey of law topics that are relevant for managers of public and nonprofit organizations.
Term Offered: Spring, Summer, Fall

PSC 5590 Law, Policy And The Politics of Sexuality
[3 credit hours]
This course explores the public policies that affect the lesbian, gay, bisexual and transgender communities in the United States and in other countries. It examines the factors that affect policymaking in this area.
Term Offered: Spring, Fall

PSC 5720 International Organizations
[3 credit hours]
A study of the background, aims, purposes and problems of international organizations. An examination of the functions of the specialized agencies and other organizations of the United Nations system.
Term Offered: Fall

PSC 5950 Mpa Research Report
[2 credit hours]
Independent research, under the direction of a faculty adviser, analyzing experience as a public official.
Term Offered: Spring, Summer, Fall

PSC 5980 Current Topics In Political Science
[3 credit hours]
Examination of emerging issues within the various segments and subfields of the discipline of political science.
Term Offered: Spring, Fall

PSC 5990 Independent Study In Political Science
[1-3 credit hours]
Individual study in selected topic.
Term Offered: Spring, Summer, Fall

PSC 6110 Public Policy Methods and Analysis
[3 credit hours]
This course explores research methodology as used in public affairs and public administration. We will analyze political phenomena in a rigorous and scientific manner and connect research methods to practice of administration. Topics include research design, research ethics, quantitative and qualitative methodological approaches, basic statistical techniques for data analysis through measures of association and regression. By doing so, this course assists in the professional development of in-service and pre-service practitioners of public management.
Term Offered: Spring, Summer, Fall

PSC 6420 Program Evaluation
[3 credit hours]
Evaluating the effectiveness of programs and policies is an essential component of public, nonprofit and private sector management. This class is an introduction to the field of program evaluation. Evaluation uses research methodology to investigate the formation, implementation and administration of public policies and public programs.
Term Offered: Spring, Summer, Fall

PSC 6430 Public Policy Process
[3 credit hours]
Application of current theories of the public policy process to current issues in public policy and management. Emphasis on the dominant theories of the process, including policy streams, advocacy coalitions, punctuated equilibrium, institutional and rational choice models.
Term Offered: Spring, Summer, Fall

PSC 6490 Public Administration Capstone
[3 credit hours]
This course concludes the MPA curriculum at the University of Toledo. It is designed to integrate theoretical and practical knowledge to help students further their public and non-profit sector careers.
Term Offered: Spring, Summer, Fall

PSC 6940 Professional Experience
[1 credit hour]
Professional experience, such as an internship or professional project, in public or nonprofit agency and preparation for the MPA Capstone course.
Term Offered: Spring, Summer, Fall

PSC 6960 Thesis Seminar
[1-6 credit hours]
Supervision of master's thesis writing.
Term Offered: Spring, Summer, Fall

Graduate Certificate in Health Care Policy and Administration

Code	Title	Hours
PSC 5410	Public and Nonprofit Management (required)	3
PSC 6430	Public Policy Process (required)	3
PUBH 6620	Introduction to Health Policy and Health Systems (required)	3
Select two of the following		6
PSC 5420	Political Determinants of Health	
DST 6600	Disability Ethics and Policy (elective)	
ECON 5750	Health Economics (elective)	
PUBH 6020	Management and Leadership in Public Health (elective)	
PUBH 6310	Public Health Assessment and Planning (elective)	
PUBH 6320	Implementation of Public Health Programs (elective)	
PUBH 6420	Social Marketing in Health (elective)	
PUBH 6800	Evaluation Of Health Programs (elective)	
SOC 5160	Health And Gender (elective)	
Or other course approved by the MPA director		
Total Hours		**15**

First Year

First Term		**Hours**
PSC 5410	Public and Nonprofit Management	3
PSC 6430	Public Policy Process	3
PUBH 6620	Introduction to Health Policy and Health Systems	3
	Hours	**9**
Second Term		
PUBH 6020	Management and Leadership in Public Health	3
SOC 5160	Health And Gender	3
	Hours	**6**
	Total Hours	**15**

- PLO 1. Identify and describe best practices in the management of health care related organizations.
- PLO 2. Describe healthcare related policymaking.
- PLO 3. Explain how health care policy in the United States affects health care related organizations.

Graduate Certificate in Management of Non-Profit Organizations

This program is intended both for professionals already working or volunteering in the nonprofit sector, and for students without professional experience who seek to prepare themselves for nonprofit careers.

The fundamental organizational and management principles provided by this program can be used by leaders in the nonprofit sector to strengthen both their systems and service delivery. The Certificate will prepare students to lead and administer nonprofit organizations as paid staff, directors, board members, philanthropists or volunteers in human-service, cultural, educational, religious and community organizations. In addition, students in the MPA and other graduate programs can use their elective hours to earn this certificate.

The nonprofit management certificate consists of 12 graduate credit hours of which 6 hours are from required courses:

Code	Title	Hours
PSC 5410	Public and Nonprofit Management	3
PSC 5480	Introduction to Nonprofits	3

Select 2 of the following:		6
PSC 5220	Advocacy Groups in US Politics	
PSC 5380	Fundraising	
PSC 5430	Human Resources Management in Public and Nonprofit Organizations	
COMM 6630		
PUBH 6630		
THR 5250	Administration and Management of the Arts	
THR 5260	Promoting the Visual and Performing Arts	
Other related course approved by the MPA director		
Total Hours		**12**

Currently enrolled MPA students may not apply their required courses (PSC 5430 and PSC 5440) toward this certificate.

First Term		**Hours**
PSC 5480	Introduction to Nonprofits	3
PSC 5430	Human Resources Management in Public and Nonprofit Organizations	3
	Hours	**6**
Second Term		
PSC 5380	Fundraising	3
PSC 5410	Public and Nonprofit Management	3
	Hours	**6**
	Total Hours	**12**

- PLO 1. Identify and describe best practices in the management of nonprofit organizations.
- PLO 2. Identify and describe challenges and opportunities facing nonprofit organizations in the 21st century.
- PLO 3. Identify, define, and demonstrate skills necessary for effectively managing nonprofit organizations.

Graduate Certificate in Municipal Administration

The primary purpose of this certification is to strengthen the professional management skills of personnel in responsible local government administrative positions. These include supervisors, department heads, administrative assistants and others who need more management training to enhance their career prospects. Students in the M.P.A. program may also use their electives to receive this certificate. In addition, this certificate program is appropriate for graduate students in geography and planning and civil engineering who wish to improve their knowledge of administration.

Municipal Administration Certificate (12 hours of which 6 hours are from required courses)

Code	**Title**	**Hours**
PSC 5320	Urban Policy & Administration	3
PSC 5410	Public and Nonprofit Management	3
Two of the following:		6
PSC 5360	Ethics In Public Policy And Administration	
PSC 5430	Human Resources Management in Public and Nonprofit Organizations	
PSC 5440	Budgeting And Financial Administration	
PSC 6420	Program Evaluation	
PSC 6430	Public Policy Process	
COMM 6630		
GEPL 5110	Geographic Information Systems	
GEPL 5180	Geographic Information Systems Applications	
GEPL 5210	Land Use Planning	
GEPL 5530	Principles Of Urban Planning	
GEPL 5750	Transportation Geography	
Other related graduate electives approved by the MPA director		
Total Hours		**12**

Currently enrolled MPA students may not apply their required courses (PSC 5430, PSC 5440 andPSC 6430) toward this certificate.

The primary purpose of this certification is to strengthen the professional management skills of personnel in responsible local government administrative positions. These include supervisors, department heads, administrative assistants and others who need more management training to enhance their career prospects. Students in the M.P.A. program may also use their electives to receive this certificate. In addition, this certificate program is appropriate for graduate students in geography and planning and civil engineering who wish to improve their knowledge of administration.

Municipal Administration Certificate (12 hours of which 6 hours are from required courses)

Code	**Title**	**Hours**
PSC 5320	Urban Policy & Administration	3
PSC 5410	Public and Nonprofit Management	3
Two of the following:		6
PSC 5360	Ethics In Public Policy And Administration	
PSC 5430	Human Resources Management in Public and Nonprofit Organizations	
PSC 5440	Budgeting And Financial Administration	
PSC 6420	Program Evaluation	
PSC 6430	Public Policy Process	
COMM 6630		
GEPL 5110	Geographic Information Systems	
GEPL 5180	Geographic Information Systems Applications	
GEPL 5210	Land Use Planning	
GEPL 5530	Principles Of Urban Planning	
GEPL 5750	Transportation Geography	
Other related graduate electives approved by the MPA director		
Total Hours		**12**

Currently enrolled MPA students may not apply their required courses (PSC 5430, PSC 5440 andPSC 6430) toward this certificate.

First Term		Hours
GEPL 5110	Geographic Information Systems	3
PSC 5320	Urban Policy & Administration	3
	Hours	**6**
Second Term		
PSC 5440	Budgeting And Financial Administration	3
PSC 5410	Public and Nonprofit Management	3
	Hours	**6**
	Total Hours	**12**

- PLO 1. Identify and describe best practices in municipal government.
- PLO 2. Identify and describe challenges and opportunities facing local governments in the 21st century.
- PLO 3. Identify, define, and demonstrate skills necessary for effectively managing municipal governments.

Joint J.D./M.P.A. Degree

The J.D./M.P.A. dual degree program offers graduate students the opportunity to earn two graduate degrees evidencing the completion of the curriculum for the juris doctor (J.D.) from the College of Law and the curriculum for the master of public administration (M.P.A.) from the Judith Herb College of Arts, Social Sciences, and Education Department of Political Science and Public Administration. The program is administered jointly by the College of Law and the department of political science and public administration. The program is designed for students who wish to be effective in administrative and regulatory positions in public and in private, nonprofit organizations.

To be admitted to the J.D./M.P.A. program, a student must first be admitted to both the College of Law and the M.P.A. program in the department of political science and public administration. The student must qualify for admission to each degree program, make separate application for admission to each program, and be admitted to each program in order to be eligible for the J.D./M.P.A. program. After admission to the College of Law and the M.P.A. program in the department of political science and public administration, the student must be admitted to the J.D./M.P.A. program by the coordinating committee.

Juris Doctor: In order to qualify for the juris doctor from the College of Law, a student must comply with all the academic and nonacademic rules of the college, with respect to the admission process and during the period after initial enrollment in the college until the granting of the degree. The College of Law will grant credit toward the J.D. for certain courses taken in the department of political science and public administration under the J.D./M.P.A. program, as detailed below.

Master of Public Administration Degree: In order to be eligible for the M.P.A. degree from the department of political science and public administration in the Judith Herb College of Arts, Social Sciences, and Education, a student must complete at least 12 graduate-level courses (36 credit hours),with an overall minimum GPA of 3.0. A student must complete any prerequisite courses and all required courses (except PSC 5560 Law and Administration from which College of Law students are exempt).

Course Requirements: College of Law Credit for Certain Political Science Courses in the J.D./M.P.A. Program: Under the J.D./M.P.A. program, up to 12 semester credit hours of approved graduate M.P.A. courses may be applied toward the completion of the total credit hours required for the J.D. The student must earn a grade of B (3.0) or better in an M.P.A. course for the course to be credited toward the J.D.

The 12 hours of approved M.P.A. courses are as follows:

PSC 5430 Human Resources Management in Public and Nonprofit Organizations (3 hours)
PSC 5440 Budgeting and Financial Administration (3 hours)
PSC 6110 Public Policy Methods and Analysis (3 hours)
PSC 6430 Public Policy Analysis Process (3 hours)

On written application by the student, and for good cause shown, the associate dean of the College of Law may substitute another graduate PSC course for one on the approved list

Political Science Credit for Certain College of Law Courses in the J.D./M.P.A. Program: Under the J.D./M.P.A. program, up to 12 semester credit hours of approved upper-level courses in the College of Law may be applied toward the completion of the 36 credit hours required for the M.P.A. degree. In College of Law graded courses, the student must earn a grade of C (2.0) or better; and in College of Law ungraded courses, the student must earn a Pass or better for the course to be granted credit toward the M.P.A. degree. Courses eligible for transfer are:

Constitutional Law – Structure
Constitutional Law – Rights
Property – Transactions and Land Use
Administrative Law

Scheduling: A full-time student entering the College of Law must enroll full time exclusively in the College of Law beginning in the fall, for the first academic year. A part-time student entering the College of Law must enroll exclusively in the College of Law beginning in the fall of the first year, for two academic years.

Master of Public Administration

The Master of Public Administration (MPA) is a professional degree for those pursuing administrative careers in government and nonprofit organizations. The program serves part-time and mid-career, as well as full-time students. Click hear to learn more (https://www.utoledo.edu/Programs/grad/Public-Administration/).

Applicants to the MPA program must satisfy the following requirements:

1. An undergraduate degree with a minimum GPA of 2.5 calculated on a 4.0 basis or 5 years of relevant work experience;

2. GRE and TOEFL scores: GRE scores are not required. However, in addition to the requirements for regular admission, all applicants from non-English speaking countries must take either the Test of English as a Foreign Language Internet-Based Test (TOEFL iBT) or the International English Language Testing System (IELTS). Admission to graduate study in the Department of Political Science and Public Administration requires a TOEFL iBT score of at least 100 or a IELTS score of at least 7.0 overall;

3. Three letters of recommendation, which must be academically or employment related. These should be from individuals familiar with the applicant's academic abilities and professional goals. Applicants who obtained their undergraduate degrees in the last three years must submit at least one academic letter;

4. A thoughtfully drafted statement of purpose; and

5. Official transcripts from all previous colleges or universities you have attended (both graduate and undergraduate).

Early Admission to Master of Public Administration Program

Description

The Early Admission option allows advanced undergraduates to enroll for graduate level-credit in up to 9 hours of 5000-level classes that will simultaneously contribute towards their bachelor's degree and their Master of Public Administration degree. Students accepted in the Early Admission Program receive both graduate and undergraduate credit for these classes; undergraduate instructional fees will apply to these courses.

Eligibility

To be eligible for the Early Admission program, students must:

- Major in any social science bachelor's degree program and/or be enrolled in another bachelor's degree program and minor in political science or public administration.
- Grade point average: For students majoring or minoring in Political Science or minoring in Public Administration a minimum GPA of 3.0 and a 3.2 GPA within the major/minor is required. For other social science majors, a cumulative GPA of 3.2 is required. Grade point average shall be calculated solely on University of Toledo earned credits.
- Undergraduate advisor's approval
- Permission of the Political Science department chair
- Permission of the MPA program director
- Have at least junior standing when applying for the program.

Application Process

To apply for the Early Admission program, students should submit to the Chair of the Department of Political Science and Public Administration (jetsabe.caceres@utoledo.edu):

1. An application for Early Admission (See https://www.utoledo.edu/al/pspa/pdfs/MPAEarlyAdmissionsApplication.pdf)
2. A letter of interest (which may be reused in the graduate school application)
3. Two letters of recommendation (from an undergraduate advisor and one undergraduate course instructor)
4. After initial approval from the Chair of the Department of Political Science and Public Administration and MPA Director, students must also apply for admission to the College of Graduate Studies for the semester in which they intend to matriculate. See https://www.utoledo.edu/graduate/apply/

Students accepted into this option will initially be granted provisional graduate admission to allow them to enroll in 5000-level courses that are approved for the MPA program. To receive dual (undergraduate and graduate) credit, the following conditions apply:

- Courses must be taken at The University of Toledo after acceptance into the Early Admission option.
- Only 5000-level courses that are approved for the MPA program may be taken.
- Students must complete all graduate-level requirements in the course and be evaluated by the same criteria as graduate students.
- Students complete a graduate plan of study indicating courses that will receive graduate and undergraduate credit.

Degree Requirements:

The MPA is a graduate program comprised of 36 hours. 21 hours of required courses are:

Code	Title	Hours
PSC 5300	Principles of Public Administration	3
PSC 5430	Human Resources Management in Public and Nonprofit Organizations	3
PSC 5440	Budgeting And Financial Administration	3
PSC 5560	Law And Public Administration	3
PSC 6110	Public Policy Methods and Analysis	3
PSC 6430	Public Policy Process	3
PSC 6490	Public Administration Capstone	3
Electives (15 hours of 5000 or 6000 MPA related electives) from the list of MPA electives. Students develop a coherent area of focus with courses selected in consultation with the MPA director.		15
PSC 5220	Advocacy Groups in US Politics	
PSC 5320	Urban Policy & Administration	
PSC 5340	Environmental Policy And Administration	
PSC 5360	Ethics In Public Policy And Administration	
PSC 5380	Fundraising	
PSC 5410	Public and Nonprofit Management	
PSC 5420	Political Determinants of Health	
PSC 5480	Introduction to Nonprofits	
PSC 6420	Program Evaluation	
DST 6600	Disability Ethics and Policy	
ECON 5620	Regional Economics	
ECON 5660	Public Finance Economics	
ECON 5750	Health Economics	
ECON 5810	Econometrics Models And Methods I	
ECON 5820	Econometrics Models And Methods II	
GEPL 5110	Geographic Information Systems	
GEPL 5180	Geographic Information Systems Applications	
GEPL 5210	Land Use Planning	
GEPL 5530	Principles Of Urban Planning	
GEPL 5700	Community Planning Workshop	
GEPL 5710	Urban Geography	
GEPL 5750	Transportation Geography	
GEPL 6530	Seminar-Urban/Regional Planning Applications	

GEPL 6550	Seminar In Environment Planning
HURM 6720	Advanced Negotiation and Conflict Management
PUBH 6020	Management and Leadership in Public Health
PUBH 6310	Public Health Assessment and Planning
PUBH 6320	Implementation of Public Health Programs
PUBH 6420	Social Marketing in Health
PUBH 6620	Introduction to Health Policy and Health Systems
PUBH 6800	Evaluation Of Health Programs
SOC 5160	Health And Gender
THR 5250	Administration and Management of the Arts
THR 5260	Promoting the Visual and Performing Arts

Other courses may be approved as electives by the MPA director if they provide a coherent public administration related area of focus. Non-MPA core courses taken as part of a graduate certificate sponsored by the Departments of Political Science and Public Administration, Geography and Planning, or Economics will be approved as elective courses in the MPA program.

Combined Bachelor's to Master's – B.A. Political Science to Master of Public Administration (M.P.A.)

Undergraduate students accepted to the B.A. Political Science to Master of Public Administration (M.P.A.) combined bachelor's/master's pipeline program will be admitted to the Master of Public Administration (M.P.A.) program and may complete up to three graduate-level courses (9 credit hours) during their final year of undergraduate study. Students must apply for admission to the College of Graduate Studies for the semester in which they intend to matriculate. They will continue into the graduate program upon completion of undergraduate degree requirements.

Up to 9 credit hours of graduate coursework completed as an undergraduate will be applied to both undergraduate and graduate degree requirements. It is the joint responsibility of faculty and administrators in the undergraduate and graduate programs to monitor student progress, ensure that the 9-credit-hour limit is strictly enforced, and request that the College of Graduate Studies update the student's matriculation from undergraduate to graduate upon completion of undergraduate degree requirements.

The following provisions apply to graduate coursework taken as part of the pipeline program:

Courses must be taken at The University of Toledo after the student is accepted into the pipeline program.

The following courses may be applied toward the approved 9 credit hours: PSC 5300, PSC 5430, PSC 5440, PSC 5560, PSC 5220, PSC 5320, PSC 5340, PSC 5360, PSC 5380, PSC 5410, PSC 5480.

Students interested in the combined program must submit a graduate application to the College of Graduate Studies.

Suggested Plan of Study with Nonprofit Management Certificate

First Term		Hours
PSC 6110	Public Policy Methods and Analysis	3
PSC 5300	Principles of Public Administration	3
PSC 5480	Introduction to Nonprofits	3
	Hours	**9**
Second Term		
PSC 5560	Law And Public Administration	3
PSC 5440	Budgeting And Financial Administration	3
PSC 5380	Fundraising	3
	Hours	**9**
Third Term		
PSC 6430	Public Policy Process	3
PSC 5430	Human Resources Management in Public and Nonprofit Organizations	3
PSC 5320	Urban Policy & Administration	3
	Hours	**9**
Fourth Term		
PSC 5410	Public and Nonprofit Management	3
PSC 5220	Advocacy Groups in US Politics	3
PSC 6490	Public Administration Capstone	3
	Hours	**9**
	Total Hours	**36**

Suggested Plan of Study with Municipal Administration Certificate

First Term		Hours
PSC 6110	Public Policy Methods and Analysis	3
PSC 5300	Principles of Public Administration	3
GEPL 5110	Geographic Information Systems	3
	Hours	**9**
Second Term		
PSC 5560	Law And Public Administration	3
PSC 5440	Budgeting And Financial Administration	3
PSC 5410	Public and Nonprofit Management	3
	Hours	**9**
Third Term		
PSC 6430	Public Policy Process	3
PSC 5430	Human Resources Management in Public and Nonprofit Organizations	3
PSC 5320	Urban Policy & Administration	3
	Hours	**9**
Fourth Term		
GEPL 5210	Land Use Planning	3
PSC 5220	Advocacy Groups in US Politics	3
PSC 6490	Public Administration Capstone	3
	Hours	**9**
	Total Hours	**36**

- PLO 1: lead and manage in public governance;
- PLO 2: participate in and contribute to the policy process;
- PLO 3: analyze, synthesize, think critically, solve problems and make decisions;
- PLO 4: articulate and apply a public service perspective;
- PLO 5: communicate and interact productively with a diverse and changing workforce and citizenry.

Department of Psychology

Kamala London Newton, Ph.D., Chair
Peter Mezo, Associate Chair
Jason Rose, Experimental Program Coordinator
Sarah Francis, Director of Clinical Training

The Psychology department features a nationally-ranked and APA-accredited clinical psychology doctoral program (https://www.utoledo.edu/al/psychology/grad/clinical/), as well as a nationally-ranked experimental doctoral program (https://www.utoledo.edu/al/psychology/grad/experimental/) that provides training in social psychology, developmental psychology, cognitive psychology, and psychobiology and learning. Students in both programs also have multiple opportunities for advanced integrative training in clinical and experimental psychology through our joint mentoring program (https://www.utoledo.edu/al/psychology/pdfs/resources/Joint%20Mentoring%20Guidelines.pdf) and minor specializations (https://www.utoledo.edu/al/psychology/pdfs/minors/Graduate%20Minors%20in%20Psychology_F2019.pdf) in quantitative psychology, health psychology, and experimental psychopathology.

Degrees Offered

- M.A. in Psychology (p. 354)
- PhD in Psychology (p. 355)

PSY 5000 History Of Psychology
[3 credit hours]
An historical treatment of the development of modern psychology, starting in the mid 19th century, with some consideration of earlier approaches. Theoretical developments are emphasized.
Prerequisites: PSY 1010 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

PSY 6030 Research Practicum
[1-9 credit hours]
Developing, conducting, analyzing and preparing reports of research projects under faculty supervision. May be repeated.
Term Offered: Spring, Summer, Fall

PSY 6040 Teaching Practicum
[3 credit hours]
Supervised experience in the teaching of psychology. May be repeated for credit.
Term Offered: Spring, Fall

PSY 6050 Culture And Psychology
[3 credit hours]
A theoretical and empirical analysis of the systematic functioning of culture in psychological phenomena, with a focus on key concepts in clinical, cognitive, developmental and social psychology.
Term Offered: Spring

PSY 6070 The Science of Emotion
[3 credit hours]
An integrative course focusing on emotion in the context of affective and biological aspects of behavior.
Term Offered: Spring, Summer, Fall

PSY 6080 Grant Writing in Psychology
[3 credit hours]
Provides an overview of the federal grant writing process in Psychology.
Term Offered: Spring, Summer, Fall

PSY 6100 Quantitative Methods In Psychology I
[3 credit hours]
Probability theory, descriptive and inferential statistics, hypothesis testing, correlation.
Term Offered: Spring, Fall

PSY 6110 Quantitative Methods In Psychology II
[3 credit hours]
Analysis of variance, regression analyses, non-parametric analyses.
Term Offered: Spring, Fall

PSY 6130 Design And Evaluation Of Psychological Research
[3 credit hours]
Readings and discussion of problems of research design and analysis.
Term Offered: Fall

PSY 6160 Advanced Research Seminar in Psychology
[3 credit hours]
Advanced research seminar focusing on selected topics from the general science of psychology.
Prerequisites: PSY 6130 with a minimum grade of B- and PSY 7130 with a minimum grade of B-
Term Offered: Spring, Summer, Fall

PSY 6200 Systems Of Personality
[3 credit hours]
Advanced historical overview of the main systems for understanding human beings: sources of motivation, coping, dysfunction, strengths/virtues. Emphasizes philosophical understandings of personality systems, analysis of major contributions and multi-perspective critiques.
Term Offered: Spring, Fall

PSY 6210 Psychopathology
[3 credit hours]
Critical analysis of diagnostic classification models, etiological conceptualizations and therapeutic interventions form mental disorders.
Term Offered: Fall

PSY 6220 Cognitive Assessment
[4 credit hours]
Assessment of cognitive functioning, utilizing tests of cognitive abilities and achievement.
Term Offered: Spring, Fall

PSY 6230 Personality Assessment
[4 credit hours]
Assessment of personality functioning utilizing objective tests.
Prerequisites: PSY 6220 with a minimum grade of D-
Term Offered: Spring

PSY 6240 Assessment I
[4 credit hours]
This course is designed to provide clinical psychology doctoral students with the training to attain the profession-wide competency in assessment, as required by the APA Commission on Accreditation. Students will learn foundational skills in psychometrics and integrative multimethod assessment in the process of learning to administer, score, interpret, and communicate about the most commonly used standardized measures for behavioral and cognitive assessment in order to be prepared to engage in evidence-based assessment practice.
Corequisites: PSY 6290, PSY 6360
Term Offered: Spring, Fall

PSY 6250 Seminar In Clinical Psychology
[3 credit hours]
Advanced seminar focusing on selected topics from the general area of clinical psychology. -001 Clinical neuropsychology -002 Child psychopathology -003 Child Clinical Intervention -004 Marital & Family Therapy -005 Psychotherapy research & program evaluation.
Term Offered: Spring, Summer, Fall

PSY 6260 Professional And Ethical Issues
[3 credit hours]
Exploration of ethical and professional issues faced by clinical psychologists. Detailed analysis of the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct.
Term Offered: Spring, Fall

PSY 6280 Assessment II
[4 credit hours]
This course is designed to provide clinical psychology doctoral students with the training to attain the profession-wide competency in assessment, as required by the APA Commission on Accreditation. Students will learn foundational skills in psychometrics and integrative multimethod assessment in the process of learning to administer, score, interpret, and communicate about the most commonly used standardized measures for neuropsychological and personality and psychopathology assessment in order to be prepared to engage in evidence-based assessment practice.
Prerequisites: PSY 6240 with a minimum grade of D-
Corequisites: PSY 6300, PSY 6370
Term Offered: Spring

PSY 6290 Foundations of Clinical Practice I
[3 credit hours]
The goal of this course is to provide an introduction to the basic clinical skills needed to conduct intake assessments and provide therapy. Foundational clinical skills central to all forms of assessment and therapy will be reviewed and practiced, and basic tenets of professionalism and ethics relevant to clinical psychology will be discussed. Application of skills to diverse populations and cultural competence considerations for assessment and therapy will also be discussed.
Corequisites: PSY 6240, PSY 6360
Term Offered: Fall

PSY 6300 Foundations of Clinical Practice II
[3 credit hours]
The goal of this course is to provide a continued introduction, building upon the content of PSY 6300 Foundations of Clinical Practice I, to the basic clinical skills needed to conduct intake and diagnostic assessments, administer structured diagnostic interviews, and provide therapy. Foundational clinical skills central to all forms of assessment and therapy will be reviewed and practiced, including assessment and treatment techniques relevant to vulnerable and at-risk groups.
Prerequisites: PSY 6290 with a minimum grade of D-
Corequisites: PSY 6280, PSY 6370
Term Offered: Spring

PSY 6330 Psychodynamic Psychotherapy
[3 credit hours]
Didactic course covering psychoanalytic/psychodynamic theories, case conceptualization, theorapy techniques, and relevant empirical research.
Term Offered: Spring, Fall

PSY 6340 Cognitive-Behavioral Psychotherapy
[3 credit hours]
Presentation and exploration of the theory and techniques of cognitive-behavioral assessment and therapy. Emphasis on understanding the theoretical and empirical base for cognitive-behavioral interventions and implications for application in clinical and clinical-research settings.
Term Offered: Spring

PSY 6360 Foundations of Psychotherapy I
[3 credit hours]
This course is designed to provide a basis for the attainment of the profession-wide competency of intervention, with a specific focus on preparing students to develop competence in evidence-based interventions consistent with the scope of Health Service Psychology. This course will present an overview of psychopathology and various classification models of the major disorder areas, as well as provide an introduction to the major theories of psychology and the principles underlying behavioral and cognitive therapy.
Corequisites: PSY 6240, PSY 6290
Term Offered: Spring, Fall

PSY 6370 Foundations of Psychotherapy II
[3 credit hours]
This course is designed to provide a basis for the attainment of the profession-wide competency of intervention, with a specific focus on preparing students to develop competence in evidence-based interventions consistent with the scope of Health Service Psychology. This course will present an overview of and foundational knowledge relevant to four key areas of psychological intervention: (1) Cognitive Behavioral Therapy, (2) Family and Couple Therapy, (3) Psychodynamic Psychotherapy, and (4) Child and Adolescent Therapy.
Prerequisites: PSY 6360 with a minimum grade of D-
Corequisites: PSY 6280, PSY 6300
Term Offered: Spring

PSY 6380 Empirically Supported Interventions and Processes of Change
[3 credit hours]
This course is designed to provide advanced knowledge in empirically-supported interventions in clinical psychology. Specifically, this course will provide in-depth instruction in the use of psychological interventions for treatment numerous psychological conditions. All interventions or approaches taught in this course have been well researched with substantial data existing to support their effectiveness.
Prerequisites: PSY 6240 with a minimum grade of D- and PSY 6280 with a minimum grade of D- and PSY 6290 with a minimum grade of D- and PSY 6300 with a minimum grade of D- and PSY 6360 with a minimum grade of D- and PSY 6370 with a minimum grade of D-
Term Offered: Spring, Fall

PSY 6390 Clinical Laboratory
[3 credit hours]
Clinical interviewing, diagnostic assessment, case conceptualization and oral presentation of clinical cases. Diagnostic, therapeutic and professional issues are addressed via didactic coursework and practicum work with clients in the Psychology Clinic.
Term Offered: Spring

PSY 6400 Cognitive Psychology
[3 credit hours]
An intensive examination of human information processing. Topics include neural bases of cognition, perceptual and attentional processing, mental imagery, memory, problem solving and reasoning.
Term Offered: Spring, Summer, Fall

PSY 6410 Seminar In Cognitive Psychology
[3 credit hours]
An advanced seminar focusing on selected topics from the general area of Cognitive Psychology.
Term Offered: Spring, Fall

PSY 6500 Developmental Psychology
[3 credit hours]
Advanced treatment of the theoretical and empirical literature in developmental psychology, and of the major issues of the field.
Term Offered: Spring, Fall

PSY 6510 Seminar In Developmental Psychology
[3 credit hours]
Readings and evaluative discussions of the primary research literature in developmental psychology.
Prerequisites: PSY 6500 with a minimum grade of D-
Term Offered: Spring, Fall

PSY 6600 Behavioral Neuroscience
[3 credit hours]
Structure and function of neurons and the neural mediation of behavior, both normal and abnormal.
Term Offered: Summer

PSY 6700 Social Psychology
[3 credit hours]
Social cognition and behavior, interpersonal influence and social relations will be addressed.
Term Offered: Spring, Fall

PSY 6710 Seminar In Social Psychology
[3 credit hours]
In-depth treatment of selected topics in Social Psychology.
Term Offered: Spring, Fall

PSY 6720 Social Cognition
[3 credit hours]
This course examines how people make sense of other people, themselves, and social situations by examining the cognitive structures and processes involved in judgments, decisions, perceptions, beliefs, and behavior. The topics include (but are not limited to) attribution, counterfactual thinking, judgment heuristics, schemas, person perception, attitudes, and stereotypes/prejudice.
Term Offered: Spring, Fall

PSY 6810 Clinical Practicum I
[0-3 credit hours]
This first-year practicum course includes observation of and entry-level participation in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Term Offered: Spring, Fall

PSY 6820 Clinical Practicum II
[3 credit hours]
This second-year practicum course includes participation, as a beginning student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PSY 6830 Clinical Practicum III
[1-3 credit hours]
This third-year practicum course includes participation, as an experienced student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of C and PSY 6820 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PSY 6840 Clinical Practicum IV
[1-3 credit hours]
This fourth-year practicum course includes participation, as a senior-level student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of D- and PSY 6820 with a minimum grade of D- and PSY 6830 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

PSY 6850 Family And Couple Practicum
[3 credit hours]
Supervision of psychotherapy with families and couples seen through The University of Toledo Psychology Clinic.
Term Offered: Spring, Fall

PSY 6930 Seminar In Psychology
[3 credit hours]
Readings and evaluative discussions of the primary research literature in psychology.
Term Offered: Spring, Fall

PSY 6940 Supervised Clinical Practicum
[1-3 credit hours]
Supervised applied assessment, therapeutic and consultative experience in community settings.
Term Offered: Summer, Fall

PSY 6950 Community Placement in Clinical Psychology
[0 credit hours]
The Externship in Clinical Psychology is a field placement program in which students are placed in structured clinical service settings with psychologists and other behavioral healthcare providers. Students obtain supervised clinical training in the application of basic clinical psychological service skills.
Term Offered: Spring, Summer, Fall

PSY 6960 M.a. Thesis
[1-6 credit hours]
Developing, conducting and analyzing the thesis research project, writing the thesis.
Term Offered: Spring, Summer, Fall

PSY 6980 Special Topics
[1-3 credit hours]
Professional issues in academic and scientific psychology.
Term Offered: Spring, Summer, Fall

PSY 6990 Independent Study
[1-15 credit hours]
Directed reading and/or experimentation on a topic selected by the study in conjunction with a faculty mentor.
Term Offered: Spring, Summer, Fall

PSY 7030 Research Practicum
[1-9 credit hours]
Developing, conducting, analyzing and preparing reports of research projects under faculty supervision. May be repeated.
Term Offered: Spring, Summer, Fall

PSY 7040 Teaching Practicum
[3 credit hours]
Supervised experience in the teaching of psychology. May be repeated for credit.
Term Offered: Spring, Fall

PSY 7050 Culture And Psychology
[3 credit hours]
A theoretical and empirical analysis of the systematic functioning of culture in psychological phenomena, with a focus on key concepts in clinical, cognitive, developmental and social psychology.
Term Offered: Spring

PSY 7070 The Science of Emotion
[3 credit hours]
An integrative course focusing on emotion in the context of affective and biological aspects of behavior.
Term Offered: Spring, Summer, Fall

PSY 7080 Grant Writing in Psychology
[3 credit hours]
Provides an overview of the federal grant writing process in Psychology.
Term Offered: Spring, Summer, Fall

PSY 7100 Quantitative Methods In Psychology I
[3 credit hours]
Probability theory, descriptive and inferential statistics, hypothesis testing, correlation.
Term Offered: Spring, Fall

PSY 7110 Quantitative Methods In Psychology II
[3 credit hours]
Analysis of variance, regression analyses, non-parametric analyses.
Term Offered: Spring, Fall

PSY 7130 Design And Evaluation Of Psychological Research
[3 credit hours]
Readings and discussion of problems of research design and analysis.
Term Offered: Fall

PSY 7150 Psychometrics and Scale Development
[3 credit hours]
Procedures for developing and examining the reliability and validilty of test scales, including theories of measurement, item analysis, factor analysis, and diagnostic efficiency statistics.
Prerequisites: PSY 7100 with a minimum grade of D- and PSY 7110 with a minimum grade of D-

PSY 7160 Advanced Research Seminar in Psychology
[3 credit hours]
Advanced research seminar focusing on selected topics from the general science of psychology.
Prerequisites: PSY 6130 with a minimum grade of B- and PSY 7130 with a minimum grade of B-
Term Offered: Spring, Summer, Fall

PSY 7200 Systems Of Personality
[3 credit hours]
Advanced historical overview of the main systems for understanding human beings: sources of motivation, coping, dysfunction, strengths/virtues. Emphasizes philosophical understandings of personality systems, analysis of major contributions and multi-perspective critiques.
Term Offered: Spring, Fall

PSY 7210 Psychopathology
[3 credit hours]
Critical analysis of diagnostic classification models, etiological conceptualizations and therapeutic interventions form mental disorders.
Term Offered: Fall

PSY 7220 Cognitive Assessment
[4 credit hours]
Assessment of cognitive functioning, utilizing tests of cognitive abilities and achievement.
Term Offered: Spring, Fall

PSY 7230 Personality Assessment
[4 credit hours]
Assessment of personality functioning utilizing objective tests.
Prerequisites: PSY 6220 with a minimum grade of D- or PSY 7220 with a minimum grade of D-
Term Offered: Spring

PSY 7240 Assessment I
[4 credit hours]
This course is designed to provide clinical psychology doctoral students with the training to attain the profession-wide competency in assessment, as required by the APA Commission on Accreditation. Students will learn foundational skills in psychometrics and integrative multimethod assessment in the process of learning to administer, score, interpret, and communicate about the most commonly used standardized measures for behavioral and cognitive assessment in order to be prepared to engage in evidence-based assessment practice.
Corequisites: PSY 6290, PSY 6360
Term Offered: Spring, Fall

PSY 7250 Seminar In Clinical Psychology
[3 credit hours]
Advanced seminar focusing on selected topics from the general area of clinical psychology. -001 Clinical neuropsychology -002 Child psychopathology -003 Child Clinical Intervention -004 Marital & Family Therapy -005 Psychotherapy research & program evaluation.
Term Offered: Spring, Summer, Fall

PSY 7260 Professional And Ethical Issues
[3 credit hours]
Exploration of ethical and professional issues faced by clinical psychologists. Detailed analysis of the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct.
Term Offered: Spring, Fall

PSY 7280 Assessment II
[4 credit hours]
This course is designed to provide clinical psychology doctoral students with the training to attain the profession-wide competency in assessment, as required by the APA Commission on Accreditation. Students will learn foundational skills in psychometrics and integrative multimethod assessment in the process of learning to administer, score, interpret, and communicate about the most commonly used standardized measures for neuropsychological and personality and psychopathology assessment in order to be prepared to engage in evidence-based assessment practice.
Prerequisites: PSY 7240 with a minimum grade of D-
Corequisites: PSY 7300, PSY 7370
Term Offered: Spring

PSY 7290 Foundations of Clinical Practice I
[3 credit hours]
The goal of this course is to provide an introduction to the basic clinical skills needed to conduct intake assessments and provide therapy. Foundational clinical skills central to all forms of assessment and therapy will be reviewed and practiced, and basic tenets of professionalism and ethics relevant to clinical psychology will be discussed. Application of skills to diverse populations and cultural competence considerations for assessment and therapy will also be discussed.
Corequisites: PSY 7240, PSY 7360
Term Offered: Fall

PSY 7300 Foundations of Clinical Practice II
[3 credit hours]
The goal of this course is to provide a continued introduction, building upon the content of PSY 6300 Foundations of Clinical Practice I, to the basic clinical skills needed to conduct intake and diagnostic assessments, administer structured diagnostic interviews, and provide therapy. Foundational clinical skills central to all forms of assessment and therapy will be reviewed and practiced, including assessment and treatment techniques relevant to vulnerable and at-risk groups.
Prerequisites: PSY 7290 with a minimum grade of D-
Corequisites: PSY 7280, PSY 7370
Term Offered: Spring

PSY 7330 Psychodynamic Psychotherapy
[3 credit hours]
Didactic course covering psychoanalytic/psychodynamic theories, case conceptualization, therapy techniques, and relevant empirical research.
Prerequisites: PSY 7390 with a minimum grade of D-
Term Offered: Spring, Fall

PSY 7340 Cognitive-Behavioral Psychotherapy
[3 credit hours]
Presentation and exploration of the theory and techniques of cognitive-behavioral assessment and therapy. Emphasis on understanding the theoretical and empirical base for cognitive-behavioral interventions and implications for application in clinical and clinical-research settings.
Term Offered: Spring

PSY 7360 Foundations of Psychotherapy I
[3 credit hours]
This course is designed to provide a basis for the attainment of the profession-wide competency of intervention, with a specific focus on preparing students to develop competence in evidence-based interventions consistent with the scope of Health Service Psychology. This course will present an overview of psychopathology and various classification models of the major disorder areas, as well as provide an introduction to the major theories of psychology and the principles underlying behavioral and cognitive therapy.
Corequisites: PSY 7240, PSY 7290
Term Offered: Spring, Fall

PSY 7370 Foundations of Psychotherapy II
[3 credit hours]
This course is designed to provide a basis for the attainment of the profession-wide competency of intervention, with a specific focus on preparing students to develop competence in evidence-based interventions consistent with the scope of Health Service Psychology. This course will present an overview of and foundational knowledge relevant to four key areas of psychological intervention: (1) Cognitive Behavioral Therapy, (2) Family and Couple Therapy, (3) Psychodynamic Psychotherapy, and (4) Child and Adolescent Therapy.
Prerequisites: PSY 7360 with a minimum grade of D-
Corequisites: PSY 7280, PSY 7300
Term Offered: Spring

PSY 7380 Empirically Supported Interventions and Processes of Change
[3 credit hours]
This course is designed to provide advanced knowledge in empirically-supported interventions in clinical psychology. Specifically, this course will provide in-depth instruction in the use of psychological interventions for treatment numerous psychological conditions. All interventions or approaches taught in this course have been well researched with substantial data existing to support their effectiveness.
Prerequisites: PSY 6240 with a minimum grade of D- or PSY 7240 with a minimum grade of D- or PSY 6280 with a minimum grade of D- or PSY 7280 with a minimum grade of D- or PSY 6290 with a minimum grade of D- or PSY 7290 with a minimum grade of D- or PSY 6300 with a minimum grade of D- or PSY 7300 with a minimum grade of D- or PSY 6360 with a minimum grade of D- or PSY 7360 with a minimum grade of D- or PSY 6370 with a minimum grade of D- or PSY 7370 with a minimum grade of D-
Term Offered: Spring, Fall

PSY 7390 Clinical Laboratory
[3 credit hours]
Clinical interviewing, diagnostic assessment, case conceptualization and oral presentation of clinical cases. Diagnostic, therapeutic and professional issues are addressed via didactic coursework and practicum work with clients in the Psychology Clinic.
Term Offered: Spring

PSY 7400 Cognitive Psychology
[3 credit hours]
An intensive examination of human information processing. Topics include neural bases of cognition, perceptual and attentional processing, mental imagery, memory, problem solving and reasoning.
Term Offered: Spring, Fall

PSY 7410 Seminar In Cognitive Psychology
[3 credit hours]
An advanced seminar focusing on selected topics from the general area of Cognitive Psychology.
Term Offered: Spring, Fall

PSY 7500 Developmental Psychology
[3 credit hours]
Advanced treatment of the theoretical and empirical literature in developmental psychology, and of the major issues of the field.
Term Offered: Spring, Fall

PSY 7510 Seminar In Developmental Psychology
[3 credit hours]
Readings and evaluative discussions of the primary research literature in developmental psychology.
Prerequisites: PSY 6500 with a minimum grade of D-
Term Offered: Spring, Fall

PSY 7600 Behavioral Neuroscience
[3 credit hours]
Structure and function of neurons and the neural mediation of behavior, both normal and abnormal.
Term Offered: Summer

PSY 7700 Social Psychology
[3 credit hours]
Social cognition and behavior, interpersonal influence and social relations will be addressed.
Term Offered: Spring, Fall

PSY 7710 Seminar In Social Psychology
[3 credit hours]
In depth treatment of selected topics in Social Psychology.
Term Offered: Spring, Fall

PSY 7720 Social Cognition
[3 credit hours]
This course examines how people make sense of other people, themselves, and social situations by examining the cognitive structures and processes involved in judgments, decisions, perceptions, beliefs, and behavior. The topics include (but are not limited to) attribution, counterfactual thinking, judgment heuristics, schemas, person perception, attitudes, and stereotypes/prejudice.
Term Offered: Spring, Fall

PSY 7810 Clinical Practicum I
[0-3 credit hours]
This first-year practicum course includes observation of and entry-level participation in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Term Offered: Spring, Fall

PSY 7820 Clinical Practicum II
[3 credit hours]
This second-year practicum course includes participation, as a beginning student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PSY 7830 Clinical Practicum III
[1-3 credit hours]
This third-year practicum course includes participation, as an experienced student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of C and PSY 6820 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PSY 7840 Clinical Practicum IV
[1-3 credit hours]
This fourth-year practicum course includes participation, as a senior-level student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of C and PSY 6820 with a minimum grade of C and PSY 6830 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PSY 7850 Family And Couple Practicum
[3 credit hours]
Supervision of psychotherapy with families and couples seen through The University of Toledo Psychology Clinic.
Term Offered: Spring, Fall

PSY 7930 Seminar In Psychology
[3 credit hours]
Readings and evaluative discussions of the primary research literature in psychology.
Term Offered: Spring, Fall

PSY 7940 Supervised Clinical Practicum
[1-3 credit hours]
Supervised applied assessment, therapeutic and consultative experience in community settings.
Term Offered: Summer, Fall

PSY 7950 Community Placement in Clinical Psychology
[0 credit hours]
The Externship in Clinical Psychology is a field placement program in which students are placed in structured clinical service settings with psychologists and other behavioral healthcare providers. Students obtain supervised clinical training in the application of basic clinical psychological service skills.
Term Offered: Spring, Summer, Fall

PSY 7980 Special Topics
[1-3 credit hours]
Professional issues in academic and scientific psychology.
Term Offered: Spring, Summer, Fall

PSY 7990 Independent Study
[1-15 credit hours]
Directed reading and/or experimentation on a topic selected by the study in conjunction with a faculty mentor.
Term Offered: Spring, Summer, Fall

PSY 8940 APA Accredited Clinical Internship
[0-1 credit hours]
Full-time supervised training in an APA accredited predoctoral internship entity. Students will complete clinical work under direct supervision and with guidance of the program training director and internship training director. Grades will be awarded as Credit/No Credit.
Term Offered: Spring, Summer, Fall

PSY 8960 Phd Dissertation
[1-15 credit hours]
Developing, conducting and analyzing the dissertation research project; writing the dissertation.
Term Offered: Spring, Summer, Fall

M.A. in Psychology

Students enrolled in the doctoral program earn the M.A. degree in partial fulfillment of requirements for the Ph.D. degree.

A minimum of 38 semester hours beyond the bachelor's degree is required. Each student must complete specific course requirements and must complete a master's thesis. Although the program is designed to provide broad training in general psychology, it is expected that the thesis will be conducted within one of the following domains:

- clinical psychology,
- cognitive psychology,
- developmental psychology, or
- social psychology.

Code	Title	Hours
Core Requirements		**21**
Statistics & Research Design		9
PSY 6100	Quantitative Methods In Psychology I	
PSY 6110	Quantitative Methods In Psychology II	
PSY 6130	Design And Evaluation Of Psychological Research	
Core Content Courses [1]		6
Select two of the following:		
PSY 6400	Cognitive Psychology	
PSY 6410/7410	Seminar In Cognitive Psychology	
PSY 6500	Developmental Psychology	
PSY 6600	Behavioral Neuroscience	
or PSY 6070	The Science of Emotion	
or PSY 7070	The Science of Emotion	
PSY 6510/7510	Seminar In Developmental Psychology	
PSY 6700	Social Psychology	
PSY 6710/7710	Seminar In Social Psychology	
PSY 6720	Social Cognition	
Research Requirements		6
PSY 6960	M.a. Thesis	
Other		
Master's thesis passed by thesis committee [2]		
Track Requirements		**17**
Select one of the following track:		17
Clinical Psychology		
1. Clinical Core		
PSY 6240	Assessment I	
PSY 6360	Foundations of Psychotherapy I	
PSY 6280	Assessment II	
PSY 6380	Empirically Supported Interventions and Processes of Change	
2. Practicum		
PSY 6810	Clinical Practicum I	
Experimental Psychology		
1. Seminars		
Select two of the following: [3]		6
PSY 6410/7410	Seminar In Cognitive Psychology	
PSY 6510/7510	Seminar In Developmental Psychology	
PSY 6710/7710	Seminar In Social Psychology	
2. Research Practicum		
PSY 6030	Research Practicum	
Total Hours		**82**

[1] For the core content courses, experimental students should take Cognitive (PSY6400), Developmental (PSY6500), Behavioral Neuroscience (PSY6600), Social (PSY6700), or Science of Emotion (PSY6/7070).

[2] If a student earns a grade of C+ or below in a course, that course will not be allowed to fill a requirement.
If a student earns a second grade of C+ or below, that student will be dismissed from the doctoral program.

[3] Chosen in area of specialization (i.e., social, cognitive, developmental, psychobiology), courses chosen outside of specialization must be approved by advisor and experimental coordinator.

- PLO 1: Ethical and Legal Standards Demonstrate knowledge of and operate in a manner consistent with the APA Ethical Principles of Psychologists and Code of Conduct as well as with all relevant laws, regulations, rules, and policies regulating the scholarly and professional activities of psychologists.
- PLO 2: Professional Values and Attitudes Act in a professional manner, employing and demonstrating self-reflection, an openness to constructive feedback on scholarly products, and the ability to apply and integrate constructive feedback in scholarly activities.
- PLO 3: Communication Skills Create oral and written communications that are well-integrated and informative to the field of study. Evaluate oral and written communications of peers and professionals in the field.
- PLO 4: Interpersonal Skills - Demonstrate effective interpersonal skills with relevant colleagues, supervisors, and organizations.
- PLO 5: Research Comprehension - Critically evaluate research and other scholarly activities.
- PLO 6: Research Production - Formulate and produce research and other scholarly activities (including critical literature reviews and theoretical papers) at a level that can contribute to the scientific literature. Disseminate research and other scholarly activities via peer-reviewed journals and local, regional, and national conference presentations.
- PLO 7: Knowledge of Individual and Cultural Diversity Describe and discuss how personal and cultural history, attitudes, and biases might influence interactions with, or research examining, persons of dissimilar histories, attitudes, and biases.
- PLO 8: Integration of Individual and Cultural Diversity - Integrate knowledge of individual and cultural differences into research and other scholarly activities.

PhD in Psychology

A minimum of 92 semester hours of course work is required in the Ph.D. program in psychology, 45 hours of core requirements, and a minimum of 47 hours in one of two areas of concentration – experimental or clinical psychology. Training in clinical psychology, which is fully accredited by the American Psychological Association, provides students with a broad educational foundation in the science and the practice of clinical psychology. Training in experimental psychology allows students to focus on various aspects of cognitive psychology and language, developmental psychology, and social psychology.

Applicants must satisfy admission requirements of the College of Graduate Studies, the Judith Herb College of Arts, Social Sciences and Education, and the department. Each applicant must submit an application, transcripts of previous academic work, and three letters of recommendation. A statement of purpose, which describes the student's research interests and career goals, is also required from each applicant.

The purpose of the doctoral program is to prepare students for careers in academia (teaching, research, clinical work), in mental health programs, in clinical intervention settings, as well as in other settings. Doctoral training emphasizes the inculcation of scientific attitudes with regard to the gathering and evaluation of information; the solving of basic and applied research problems; and clinical assessment and psychotherapy. Each student must complete specific course requirements, a master's thesis, doctoral examinations, and a doctoral dissertation. An individual plan of study is developed by the student in consultation with the academic advisor and advisory committee.

- Concentration in Clinical Psychology (p. 355)
- Concentration in Experimental Psychology (p. 356)

Concentration in Clinical Psychology

Code	Title	Hours
Core Courses		
Core Methods Courses		12
PSY 6100/7100	Quantitative Methods In Psychology I	
PSY 6110/7110	Quantitative Methods In Psychology II	
PSY 6130/7130	Design And Evaluation Of Psychological Research	
Advanced Statistics Elective, approved by adviser		
Core Content Courses [1, 2, 3]		*6*
Select two of the following:		
PSY 6400/7400	Cognitive Psychology	
PSY 6500/7500	Developmental Psychology	
PSY 6510/7510	Seminar In Developmental Psychology	
PSY 6600/7600	Behavioral Neuroscience	
or PSY 6070	The Science of Emotion	
or PSY 7070	The Science of Emotion	
PSY 6700/7700	Social Psychology	
PSY 6710/7710	Seminar In Social Psychology	
PSY 6720/7720	Social Cognition	
Research Requirements		27
PSY 6960	M.a. Thesis	
PSY 8960	Phd Dissertation	
PSY 7030	Research Practicum	
PSY XXXX six hours of advanced research electives.		
Other		
Qualifying Exam passed by committee		
Doctoral disssertation passed by dissertation comittee		
Minimum GPA 3.0 [2]		
Concentration Requirements		**47**
Clinical Area		
1. Clinical Core Courses		
PSY 6810	Clinical Practicum I	

PSY 6240/7240	Assessment I
PSY 6280/7280	Assessment II
PSY 6360/7360	Foundations of Psychotherapy I
PSY 6380/7380	Empirically Supported Interventions and Processes of Change
2. Clinical Practica [5]	
Select at least 14 hours of the following:	
PSY 6820/7820	Clinical Practicum II
PSY 6830/7830	Clinical Practicum III
PSY 6840/7840	Clinical Practicum IV
3. Specialized Coursework/Electives [4]	
PSY 6250/7250	Seminar In Clinical Psychology
Seminar in Experimental Psychology	
Additional Statistics of Methods Courses	
Advanced Clinical Seminar	
PSY 8940	APA Accredited Clinical Internship
Total Hours	**92**

[1] Students must demonstrate foundational knowledge in the current body of research and methods in *each* of the following core areas: Affective, Biological, Cognitive, Developmental, Social. This can be fulfilled with the following courses: PSY 6/7070 The Science of Emotion; PSY 6/7400 Cognitive Psychology; PSY 6/7500 Developmental Psychology; PSY 6/7700 Social Psychology. Alternatives to courses in this list must be coordinated with your Faculty Mentor and approved by the DCT. It is very important that the student and their mentor check with the APA C-7 discipline specific knowledge requirements. For the approved alternative, students should complete the ***Current Student Psychology Discipline Specific Knowledge (DSK) Course Alternative Form*** (see Appendix C) and place copies of all material in their file.

[2] Students also must fulfill a History and Systems of Psychology requirement. This can be fulfilled by either (1) an undergraduate transcript indicating a grade of B- or higher and the syllabus for a course pertaining to the History and Systems of Psychology, or (2) successfully completing PSY 5000 (History of Psychology) as an elective course in the program.

[3] For clinical students, one 3-hour elective course used to fulfill this requirement must be a core content course not previously fulfilled in the above list. For example, if the student has taken 6/7400 and 6/7700 to fulfill the core content course requirement above, one of the electives to fulfill the elective requirement must be 6/7500, or a course equivalent as described in footnote '1' to the core course requirements.

[4] A student in the Clinical Program may elect to substitute up to 4 hours of Clinical Practicum III or Clinical Practicum IV with up to 4 hours of Research Practicum.

[5] For clinical students, up to 6 credit hours of PSY 6/7030 (not used to fulfill the "research practicum" requirement above) may be taken to fulfill the elective requirement.

Concentration in Experimental Psychology

Code	Title	Hours
Core Courses		
Core Methods Courses		12
PSY 6100/7100	Quantitative Methods In Psychology I	
PSY 6110/7110	Quantitative Methods In Psychology II	
PSY 6130/7130	Design And Evaluation Of Psychological Research	
Advanced Statistics Elective, approved by adviser		
Core Content Courses [1]		*6*
Select two of the following:		
PSY 6400/7400	Cognitive Psychology	
PSY 6500/7500	Developmental Psychology	
PSY 6510/7510	Seminar In Developmental Psychology	
PSY 6600/7600	Behavioral Neuroscience	
or PSY 6070	The Science of Emotion	
or PSY 7070	The Science of Emotion	
PSY 6700/7700	Social Psychology	
PSY 6710/7710	Seminar In Social Psychology	
PSY 6720/7720	Social Cognition	
Research Requirements		27
PSY 6960	M.a. Thesis	
PSY 8960	Phd Dissertation	
PSY 7030	Research Practicum	
PSY XXXX six hours of advanced research electives.		
Other		
Qualifying Exam passed by committee		
Doctoral disssertation passed by dissertation comittee		
Minimum GPA 3.0		
Concentration Requirements		**47**
Experimental Area		
1 Specialty Seminars		
Select three of the following:		
PSY 6410/7410	Seminar In Cognitive Psychology	

PSY 6510/7510	Seminar In Developmental Psychology
PSY 6710/7710	Seminar In Social Psychology
2. Teaching	
PSY 7040	Teaching Practicum
3. Research Practicum	
PSY 6030/7030	Research Practicum
4. Experimental Core Courses	
Select two of the following not already taken	
PSY 6400/7400	Cognitive Psychology
PSY 6500/7500	Developmental Psychology
PSY 6700/7700	Social Psychology
PSY 6600/7600	Behavioral Neuroscience
PSY 6070/7070	The Science of Emotion
Total Hours	**92**

[1] For the core content courses, experimental students should take Cognitive (PSY6400), Developmental (PSY6500), Behavioral Neuroscience (PSY6600), Social (PSY6700), or Science of Emotion (PSY6/7070).

- PLO 1: Ethical and Legal Standards Demonstrate knowledge of and operate in a manner consistent with the APA Ethical Principles of Psychologists and Code of Conduct as well as with all relevant laws, regulations, rules, and policies regulating the scholarly and professional activities of psychologists.
- PLO 2: Professional Values and Attitudes Act in a professional manner, employing and demonstrating self-reflection, an openness to constructive feedback on scholarly products, and the ability to apply and integrate constructive feedback in scholarly activities.
- PLO 3: Communication Skills Create oral and written communications that are well-integrated and informative to the field of study. Evaluate oral and written communications of peers and professionals in the field.
- PLO 4: Interpersonal Skills - Demonstrate effective interpersonal skills with relevant colleagues, supervisors, and organizations.
- PLO 5: Research Comprehension - Critically evaluate research and other scholarly activities.
- PLO 6: Research Production - Formulate and produce research and other scholarly activities (including critical literature reviews and theoretical papers) at a level that can contribute to the scientific literature. Disseminate research and other scholarly activities via peer-reviewed journals and local, regional, and national conference presentations.
- PLO 7: Knowledge of Individual and Cultural Diversity Describe and discuss how personal and cultural history, attitudes, and biases might influence interactions with, or research examining, persons of dissimilar histories, attitudes, and biases.
- PLO 8: Integration of Individual and Cultural Diversity - Integrate knowledge of individual and cultural differences into research and other scholarly activities.

Department of Sociology and Anthropology

Thomas Zych, Chair
Karie Peralta, Graduate Director

Degrees Offered

- Graduate Certificate Disability Studies (p. 361)
- Graduate Certificate in Applied Social Research (p. 360)
- M.A. in Interdisciplinary Studies (p. 361)

- Joint Program in Law and Disability Studies (https://www.utoledo.edu/law/academics/joint-degrees/disability-studies.html)

ANTH 5300 Cultural Resource Management - WAC
[3 credit hours]
Course explores the history, theory, and contemporary issues behind the historic preservation movement and emergence of Cultural Resource Management in the United States; topics engaged include legislation, federal and state programs, the national register, regional planning, and research orientations.
Term Offered: Spring, Summer, Fall

ANTH 5440 People, Population, and Society: Demographic Analysis
[3 credit hours]
Methods of population analysis, including examination and evaluation of data sources.
Term Offered: Spring, Summer

ANTH 5450 Exploring the City
[3 credit hours]
This course takes an interdisciplinary approach to life in cities around the world, with emphasis on the ethnographic exploration of how power, cultural difference, and social inequality in cities are produced and experienced.
Term Offered: Spring, Fall

ANTH 5530 Qualitative Approaches in Social Science Research
[3 credit hours]
This course examines qualitative methods used in social science research. Focusing on ethnographic and qualitative methods, the course provides students the skills necessary to design and conduct qualitative research studies.
Term Offered: Spring, Fall

ANTH 5740 Nutritional Anthropology
[3 credit hours]
An examination of the historical, social, political and economic factors that influence the production, distribution and consumption of food and the effects on world health and development.
Term Offered: Spring, Fall

ANTH 5760 Medical Anthropology
[3 credit hours]
An examination of the biocultural nature of health and illness.
Term Offered: Spring, Fall

ANTH 5980 Problems In Anthropology
[3 credit hours]
Courses on varied anthropological specialties. May be repeated in different specialty areas such as religion, ethnohistory, ethnic conflict and area courses.
Term Offered: Spring, Summer, Fall

ANTH 6990 Independent Research In Anthropology
[1-3 credit hours]
Supervised independent research in anthropology.
Term Offered: Spring, Fall

MLS 6000 Introduction to Interdisciplinary Studies
[3 credit hours]
A gateway experience for incoming Master of Arts in Interdisciplinary Studies students. Students will learn the conventions and expectations of graduate-level reading, writing, research, critical analysis, and explore the concept of interdisciplinarity.
Term Offered: Spring, Summer, Fall

MLS 6010 MLS Seminar in Humanities
[3 credit hours]
Introduction to the concerns and methods of graduate study in the Humanities. This course will demonstrate, through readings from different eras, the interrelated nature of literature, philosophy and history.
Term Offered: Spring, Summer, Fall

MLS 6020 Mls Seminar In Social Sciences
[3 credit hours]
Drawing from major principles and concepts in the social sciences, this course examines issues of the individual and society from a range of disciplinary approaches. Special topics vary.
Term Offered: Spring, Summer, Fall

MLS 6030 Mls Seminar In Natural Sciences
[3 credit hours]
This course discusses the major ideas of the natural sciences in terms of their impact upon the human species. Specific topics vary.
Term Offered: Spring, Summer, Fall

MLS 6040 Mls Seminar In The Visual And Performing Arts
[3 credit hours]
An examination of the concept of creativity in the fields of visual art, theater, dance and music. Topics covered vary with instructor.
Term Offered: Spring, Summer, Fall

MLS 6100 Interdisciplinary Research Methods
[3 credit hours]
Exploration of what it means to use interdisciplinary approaches to research and writing. The course focuses on the logic of interdisciplinary research and how to use disciplinary research epistemologies in interdisciplinary projects. The course also discusses institutional Review Boards and ethical treatment of human subjects in research.
Term Offered: Spring, Fall

MLS 6400 Studies In Humanities
[1-6 credit hours]
Individually supervised study in the humanities. Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Summer, Fall

MLS 6500 Studies In Social Sciences
[1-6 credit hours]
Individually supervised study in the social sciences. Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Summer, Fall

MLS 6600 Studies In Natural Sciences
[1-6 credit hours]
Individually supervised study in the natural sciences. Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Fall

MLS 6700 Studies In The Visual And Performing Arts
[1-6 credit hours]
Individualized or small-group study in the visual and performing arts.
Term Offered: Spring, Summer, Fall

MLS 6970 Masters of Liberal Studies Project
[1-6 credit hours]
Creative or applied capstone project supervised by faculty advisor and committee.
Term Offered: Spring, Summer, Fall

MLS 6990 Mls Thesis
[1-6 credit hours]
Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Summer, Fall

SOC 5040 Classical Theory
[3 credit hours]
19th Century theory in sociology with emphasis on A. Comte, K. Marx, E. Durkheim, T. Veblen, M. Weber and H. Spencer.
Term Offered: Spring, Fall

SOC 5100 Community Organizing And Development
[3 credit hours]
This course will review the major forms of community and organizing since World War II. Practical issues and theoretical issues will be stressed. Students will engage in intensive case study research applying the course concepts in addition to reading and writing on the various topics.

SOC 5160 Health And Gender
[3 credit hours]
An examination of gender as a predisposing factor of health status, health behavior, health care delivery, and the structure and posture of health care professionals.
Term Offered: Spring, Summer, Fall

SOC 5180 Medical Sociology
[3 credit hours]
An analysis of the sociocultural factors in health and illness, and in medical and paramedical services, and in the field of health practice as a social institution.
Term Offered: Spring, Fall

SOC 5270 Social Research Methods
[3 credit hours]
Introduction to procedures used in the various phases of sociological research.
Term Offered: Spring, Fall

SOC 5290 Social Research Statistics
[3 credit hours]
Study of major statistical procedures and techniques in sociology.
Term Offered: Spring, Fall

SOC 5340 Population And Society
[3 credit hours]
Examination of the interaction among variables of population (fertility, mortality and migration) and other aspects of societal organization.
Term Offered: Fall

SOC 5440 People, Population, and Society: Demographic Analysis
[3 credit hours]
Methods of population analysis, including examination and evaluation of data sources.
Term Offered: Spring, Summer

SOC 5450 Exploring the City
[3 credit hours]
This course takes an interdisciplinary approach to life in cities around the world, with emphasis on the ethnographic exploration of how power, cultural difference, and social inequality in cities are produced and experienced.
Term Offered: Spring, Fall

SOC 5530 Qualitative Approaches in Social Science Research
[3 credit hours]
This course examines qualitative methods used in social science research. Focusing on ethnographic and qualitative methods, the course provides students the skills necessary to design and conduct qualitative research studies.
Term Offered: Spring, Fall

SOC 5560 Fieldwork in Sociology
[6 credit hours]
This course involves the student in meaningful social research at the community level. The student is introduced to methods in fieldwork in the social sciences.
Term Offered: Spring, Summer, Fall

SOC 5710 Criminology
[3 credit hours]
Crime and criminal behavior: nature, types and extent of crime, societal reactions; problems in research and theory, prevention, control and treatment.
Term Offered: Summer

SOC 5720 Deviant Behavior
[3 credit hours]
Study of the analysis of the nature, meaning and process of deviant behavior in terms of social norms, control and societal reaction.
Term Offered: Spring, Summer, Fall

SOC 5760 Juvenile Delinquency
[3 credit hours]
Delinquency and delinquent behavior, including definitions, extent, process, types and causes; methods of prevention, protective control and treatment; institutional and non-institutional facilities and services.

SOC 5810 Gender In Cross-Cultural Perspective
[3 credit hours]
Analysis of gender stratification and its impact on culture in various nations and across ethnic groups in the United States.

SOC 5830 Social Movements
[3 credit hours]
This course analyzes how and why social protest movements form, and how and why they succeed or fail. Attention will be given to post-World War II social movements, including current examples.
Term Offered: Spring, Fall

SOC 5840 Globalization
[3 credit hours]
This course starts by looking at the historical context of globalization, showing this process is not necessarily something new. From there it focuses on three dimensions of globalization: economic, political, and cultural - stressing the interconnectedness of these issues. This course is not an exhaustive survey of all facets of globalization, but it does at least touch upon many of the major issues related to this phenomenon.
Term Offered: Spring

SOC 5850 Public and Applied Sociology
[3 credit hours]
This course introduces students to how sociological research can be made accessible to communities, organizations, and broad audiences. Students learn how they can use sociological skills and insights to improve social conditions and contribute to the betterment of society.
Term Offered: Spring, Summer, Fall

SOC 5980 Special Topics In Sociology
[3 credit hours]
Sociological examination of a developing social issue. May be repeated in different specialized topics.
Term Offered: Spring, Summer, Fall

SOC 5990 Directed Readings In Sociology
[1-3 credit hours]
Written proposal required. May be repeated for additional credit. For majors wishing to continue course work in greater depth or seeking contact with unlisted subject areas.
Term Offered: Spring, Summer

SOC 6000 Introduction To Graduate Studies In Sociology
[0 credit hours]
Graduate students are exposed to and get acquainted with the academic and professional nature of the field of sociology from the experience of several faculty members. Some of the topics that will be covered include writing theses, doing internships and seeking graduate work and careers.
Term Offered: Spring, Fall

SOC 6050 Advanced Social Theory And Political Economy
[3 credit hours]
This course will analyze and evaluate major social theories drawn from various 19th and 20th century intellectual and ideological traditions. The common subject focus of course readings is state, power and class relations.
Prerequisites: SOC 4040 with a minimum grade of D- or SOC 5040 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

SOC 6270 Advanced Social Research Methods
[3 credit hours]
Examination of advanced methods of data collection in sociological research.
Prerequisites: SOC 5270 with a minimum grade of D-
Term Offered: Spring, Fall

SOC 6290 Advanced Social Research Statistics
[3 credit hours]
Examination of advanced methods of data analysis in sociological research.
Prerequisites: SOC 5290 with a minimum grade of D-
Term Offered: Spring, Fall

SOC 6640 Seminar in Diversity and Inequality
[3 credit hours]
This course examines theories and research on diversity and inequality. Possible topics include social class, race, gender, sexual orientation and disability, plus evaluating the interconnections between these areas.

SOC 6900 Independent Research In Sociology
[1-3 credit hours]
Student-selected research topic under the supervision of a sociology faculty member. Permission to enroll is contingent on the instructor's acceptance of the student's research proposal.
Term Offered: Spring, Summer, Fall

SOC 6930 Seminars In Sociology
[3 credit hours]
Seminar on selected topics in the field of Sociology.
Term Offered: Spring, Fall

SOC 6940 Graduate Internship
[0-9 credit hours]
In applied setting in areas of student interest: community organizing - health-probation - gerontology.
Prerequisites: (SOC 6040 with a minimum grade of C or SOC 6050 with a minimum grade of C) and SOC 6270 with a minimum grade of C and SOC 6290 with a minimum grade of C
Term Offered: Spring, Summer, Fall

SOC 6960 Thesis
[1-6 credit hours]
Topic (proposal) is selected by the student and approved by a thesis committee.
Prerequisites: (SOC 6270 with a minimum grade of C and SOC 6290 with a minimum grade of C and SOC 6040 with a minimum grade of C or SOC 6050 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

SOC 6970 Master of Sociology Project
[1-6 credit hours]
Applied capstone project supervised by faculty advisor and committee that integrates the knowledge and skills in the program.
Term Offered: Spring, Summer, Fall

SOC 6990 Independent Study In Sociology
[1-3 credit hours]
Written proposal required. May be repeated for additional credit. For majors wishing to continue course work in greater depth or seeking contact with unlisted subject areas.
Term Offered: Spring, Summer, Fall

Graduate Certificate in Applied Social Research

The Applied Social Research Certificate is an interdisciplinary, 15-hour program of study administered by the Department of Sociology and Anthropology. It is designed to provide students with the opportunity to acquire practical and communicative research tools. Students must complete SOC 6270 (Advanced Social Research Methods), SOC 6290 (Advanced Social Research Statistics), and at least nine hours of electives.

To be accepted into the certificate program, students must have earned at least nine hours of graduate credit and a graduate GPA of 3.0 or higher. Those who have not earned at least nine hours of graduate credit are required to have a baccalaureate degree. Applicants with an undergraduate GPA of less than 3.0 must submit GRE scores.

Students should consult with the graduate director for additional information about program requirements and options.

Code	Title	Hours
SOC 6270	Advanced Social Research Methods	3
SOC 6290	Advanced Social Research Statistics	3
Electives		
Select 9 credits from the following:		9
SOC 5100	Community Organizing And Development	
SOC 5450	Exploring the City	
SOC 5830	Social Movements	
SOC 5840	Globalization	
SOC 6280		
SOC 5530	Qualitative Approaches in Social Science Research	
SOC 5440	People, Population, and Society: Demographic Analysis	
ANTH 5300	Historic Preservation and Cultural Resource Management - WAC	
BUAD 6400	Results-Based Management	
PSC 5590	Law, Policy And The Politics of Sexuality	
GEPL 5110	Geographic Information Systems	
GEPL 5420	Quantitative Methods in Geographic Research	
SOC 5560	Fieldwork in Sociology	
Total Hours		**15**

Graduate Certificate Disability Studies

As many as one in five people can be considered disabled, making knowledge about disability issues beneficial for all professions. This certificate enhances understanding of disability as a unique identity, history and culture. It is 100% online, and is ideal for working professionals and graduate students seeking advancement in a wide range of areas related to Disability Studies.

Code	Title	Hours
DST 6000	Disability Studies in Theory and Practice	3
DST 6200	Representations of Disability and the Rise of Disability Culture	3
DST 6400	Disability History and Rights	3
DST 6600	Disability Ethics and Policy	3
Total Hours		**12**

M.A. in Interdisciplinary Studies

Jerry Van Hoy, Director

The Master of Interdisciplinary Studies at The University of Toledo seeks to provide an intellectually challenging and academically rigorous education to non-traditional students with bachelor's degrees who desire additional study in the liberal arts. By its very nature, the Master of Interdisciplinary Studies program encourages interdisciplinary thinking and respects diverse philosophical and methodological approaches to knowledge. Degree requirements are flexible, allowing students to design a customized program of study that reflects their unique academic interests. In designing the curriculum, students are able to choose from dozens of graduate courses taught campus-wide. You can also earn a graduate certificate as part of your plan of study by incorporating certificate courses in MIS course electives.

Recognizing the unique challenges facing non-traditional students, the program attempts to provide course offerings in a variety of formats. The Master of Interdisciplinary Studies degree may be completed via distance learning or on campus. For further information, please see https://www.utoledo.edu/programs/grad/interdisciplinary-studies/ or contact the director at jerry.vanhoy@utoledo.edu.

All students seeking admission to the Master of Interdisciplinary Studies program must file an application with the College of Graduate Studies. Application materials consist of an application, a statement of purpose, writing sample, and post-secondary transcripts (not necessary for applicants with a UT degree). Applicants may request or may be requested to have an interview with the director.

EARLY ADMISSION TO THE Master of Interdisciplinary Studies PROGRAM

Students currently enrolled in the BA in Liberal Studies program of University College (UC) are given an opportunity to enroll in up to nine semester-hours of graduate course work in the Master of Interdisciplinary Studies program of the Judith Herb College of Arts, Social Sciences and Education . Students may then apply those courses and credit hours to both their BA and Master of Interdisciplinary Studies degree requirements for graduation from The University of Toledo.

Undergraduate students accepted into the LS/MIS option will be admitted to the MIS program and allowed to complete three graduate level classes. They will then continue in the MIS program upon completion of the BA degree requirements. The nine hours of graduate course work will be applied to completion of both LS and MIS degree requirements. It will be the joint responsibility of staff in UC and MIS to supervise students admitted to the LS/MIS option and to ensure that the limit of nine hours taken as an undergraduate is strictly enforced.

The following provisions apply to classes taken for graduate credit:

1. Graduate classes can be taken at The University of Toledo only *after* the student is accepted in to the LS/MIS joint program.
2. Only MIS classes numbered 6010-6040 may be included in the approved nine semester hours of graduate credit taken as an undergraduate.

Students must have a 3.3 cumulative undergraduate grade-point average to be considered for this option. Applications must contain:

1. A letter of application.
2. A completed "Regular Graduate Admission" form.
3. At least two letters of recommendation from faculty members teaching ALS/MIS classes, or upper-level classes in the students' proposed area of concentration at the graduate level.

The student and the MIS Graduate Adviser must develop an approved MIS plan of study and file this plan immediately after the student is granted graduate student status. The plan of study must specify the course work and credit hours that will be accepted as part of the LS/MIS early admission option.

Students in the Interdisciplinary Studies, MA are required to take 33 credit hours.

Code	Title	Hours
Core Seminar		
MLS 6000	Introduction to Interdisciplinary Studies	3
Research Methods		
MLS 6100	Interdisciplinary Research Methods	3
Or another research methods course chosen in consulation with the director and an adviser		3
Electives		
Courses chosen in consultation with the director and an advisor		21-24
Capstone Requirement		
Select one of the following:		3-6
MLS 6970	Masters of Liberal Studies Project	
MLS 6990	Mls Thesis	
Total Hours		**33-39**

Thesis option (MLS 6990): A thesis is a written report on original independent research conducted by the student under the supervision of his or her thesis adviser and thesis committee. The thesis must be written in scholarly format, with the appropriate citation format and extensive references. The literature review developed for the thesis

proposal should serve as the initial component of the thesis. Typical thesis length: 50 to 70 pages including all tables, figures, and references.

Project option (MLS 6970): A project is an applied or creative work. Generally a project will include a product that contributes knowledge via applied research or creative accomplishment (such as video, a course of study, short stories or essays). Projects must include an explanatory essay that includes an explanation of the methods and theory involved. In addition, the document will describe, in summarized fashion, the project development process. The literature review developed for the project proposal may serve as the basis of the explanatory essay. Typical explanatory essay length: 20 to 30 pages, including references.

Combined bachelor's to master's BA/BS in Individualized Studies to Master of Interdisciplinary Studies: Undergraduate students accepted to the BA/BS in Individualized Studies to Master of Interdisciplinary Studies option will be admitted to the Interdisciplinary Studies, MA program and allowed to complete up to three graduate level classes (nine credit hours total) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue into the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes may be taken at The University of Toledo only after the student is accepted in the program, 2) MLS 6000, MLS 6100 and one of the courses from the list below may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

DST 6000 Disability Studies in Theory and Practice
DST 6200 Representations of Disability and the Rise of Disability Culture
DST 6400 Disability History and Rights
MGMT 6100 Leading Through Ethical Decision-Making
MGMT 6150 Leading and Developing Yourself
MGMT 6190 Leading change and Organizational Improvement
MKTG 6230 Digital Marketing
PUBH 6010 Public Health Epidemiology
PUBH 6020 Management and Leadership in Public Health
PUBH 6080 Social Determinants of Health
PSC 5480 Introduction to Nonprofits
PSC 5430 Human Resources Management in Public and Nonprofit Organizations
PSC 5380 Fundraising

- PLO 1. Students will critically assess the assumptions and problem solving techniques associated with the disciplinary perspectives of the humanities, social sciences and natural sciences.
- PLO 2. Students will examine social class, race, gender, and disability in their research and writing.
- PLO 3. Students will write clearly, critically, and effectively.
- PLO 4. Students will apply an integrative process to research, problem solving or creative endeavor.

MLS 6000 Introduction to Interdisciplinary Studies
[3 credit hours]
A gateway experience for incoming Master of Arts in Interdisciplinary Studies students. Students will learn the conventions and expectations of graduate-level reading, writing, research, critical analysis, and explore the concept of interdisciplinarity.
Term Offered: Spring, Summer, Fall

MLS 6010 MLS Seminar in Humanities
[3 credit hours]
Introduction to the concerns and methods of graduate study in the Humanities. This course will demonstrate, through readings from different eras, the interrelated nature of literature, philosophy and history.
Term Offered: Spring, Summer, Fall

MLS 6020 Mls Seminar In Social Sciences
[3 credit hours]
Drawing from major principles and concepts in the social sciences, this course examines issues of the individual and society from a range of disciplinary approaches. Special topics vary.
Term Offered: Spring, Summer, Fall

MLS 6030 Mls Seminar In Natural Sciences
[3 credit hours]
This course discusses the major ideas of the natural sciences in terms of their impact upon the human species. Specific topics vary.
Term Offered: Spring, Summer, Fall

MLS 6040 Mls Seminar In The Visual And Performing Arts
[3 credit hours]
An examination of the concept of creativity in the fields of visual art, theater, dance and music. Topics covered vary with instructor.
Term Offered: Spring, Summer, Fall

MLS 6100 Interdisciplinary Research Methods
[3 credit hours]
Exploration of what it means to use interdisciplinary approaches to research and writing. The course focuses on the logic of interdisciplinary research and how to use disciplinary research epistemologies in interdisciplinary projects. The course also discusses institutional Review Boards and ethical treatment of human subjects in research.
Term Offered: Spring, Fall

MLS 6400 Studies In Humanities
[1-6 credit hours]
Individually supervised study in the humanities. Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Summer, Fall

MLS 6500 Studies In Social Sciences
[1-6 credit hours]
Individually supervised study in the social sciences. Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Summer, Fall

MLS 6600 Studies In Natural Sciences
[1-6 credit hours]
Individually supervised study in the natural sciences. Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Fall

MLS 6700 Studies In The Visual And Performing Arts
[1-6 credit hours]
Individualized or small-group study in the visual and performing arts.
Term Offered: Spring, Summer, Fall

MLS 6970 Masters of Liberal Studies Project
[1-6 credit hours]
Creative or applied capstone project supervised by faculty advisor and committee.
Term Offered: Spring, Summer, Fall

MLS 6990 Mls Thesis
[1-6 credit hours]
Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Summer, Fall

Department of Teacher Education

Marcella Kehus, chair

The Department of Teacher Education prepares and develops educators as PreK-12 teachers, curriculum specialists, and educational researchers. Graduate students may focus their study on issues of curriculum and instruction generally or within a specific subject-matter area. Students may choose to concentrate their study in primary childhood education, middle childhood education, adolescent and young adult education, special education, career and technical education, literacy education, or foreign language education.

Master's Degree programs are designed for continuing study in curriculum and instruction as well as initial teacher education leading to teaching licensure. The licensure and master's programs (LAMP) are for designed for individuals who already hold a bachelor's degree and are interested in becoming a licensed PreK-12 teacher in Ohio.

The Doctor of Philosophy Degree in curriculum and instruction is an advanced study of issues in curriculum and instruction that prepares students as educational researchers and leaders. Students may choose a concentration in curriculum and instruction, or special education.

Graduate Certificates are designed to provide students with focused study in advanced reading and literacy instruction, career-based intervention, prekindergarten special needs, or transition to work. Certificates lead to the appropriate licensure endorsements in Ohio.

ACCREDITATION

The Education programs in the Judith Herb College of Arts, Social Sciences, and Education are fully accredited by the Council for Accreditation of Educator Preparation (CAEP). This accreditation status is effective between fall 2023 and fall of 2030. The next on-site visit will take place in spring 2030. Additionally, all licensure programs are approved by the Ohio Department of Higher Education.

Master's Degrees

Master of Education in Career and Technical Education (p. 382)

Master of Education in Curriculum and Instruction (p. 384)

Master of Education in Early Childhood Education (p. 386)

Master of Education in Middle Childhood Education (p. 387)

Master of Education in Secondary Education (p. 390)

Master of Education in Special Education (p. 396)

Doctoral Degrees

Doctor of Philosophy in Curriculum and Instruction (p. 398)

- Concentrations: Curriculum and Instruction, and Special Education

Graduate Certificates

Certificate in Advanced Reading and Literacy Instruction (p. 378)

Certificate in Career-based Intervention (p. 379)

Certificate in PreKindergarten Special Needs (p. 380)

Certificate in Transition to Work (p. 382)

Courses

CI 5470 Literacy Assessment and Remediation
[3 credit hours]
Examine current evidence-based literacy practices in assessment and remediation. Emphasis on knowledge and skill needed to diagnose and assess students in reading and writing by working with an at-risk learner in a public school setting. Apply word identification, comprehension, fluency, vocabulary and writing instructional strategies for supporting readers in an experiential learning environment.
Prerequisites: Upper Division with a score of 1 or CI 3400 with a minimum grade of C and CI 3430 with a minimum grade of C and CI 3460 with a minimum grade of C
Term Offered: Spring, Summer, Fall

CI 5490 Content Area Literacy
[3 credit hours]
Study of the integration of reading comprehension, writing, oral language and word skill development and digital literacies in all areas of learning. Attention will be given to instructional methods as well as assessment practices.
Term Offered: Spring, Summer, Fall

CI 5510 Mathematics For The Young Child
[3 credit hours]
Development of mathematical understanding in young children, appropriate learning and assessment experiences and analysis of curriculum. Mathematics focus on place value, number sense, geometry, measurement, algebra, data analysis and probability.
Term Offered: Spring, Fall

CI 5980 Special Topics In Curriculum & Instruction
[1-5 credit hours]
A course developed around topics of interest and concern to educators.
Term Offered: Spring, Summer, Fall

CI 5990 Graduate Independent Study In Curriculum And Instruction
[1-5 credit hours]
Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of the faculty of the Department of Curriculum and Instruction.
Term Offered: Spring, Summer, Fall

CI 6110 Language Arts Methods of Teaching
[3 credit hours]
An initial in-depth study of methods and materials for teaching and learning the English Language Arts in middle and secondary classrooms with emphasis on planning, content standards and instructional strategies that attend to students as learners; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6210
Term Offered: Fall

CI 6120 Social Studies Methods of Teaching
[3 credit hours]
An initial in-depth study of methods and materials for teaching and learning Social Studies in middle and secondary classrooms with emphasis on planning, content standards and instructional strategies that attend to students as learners; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program.
Corequisites: CI 6220
Term Offered: Fall

CI 6130 Mathematics Method of Teaching
[3 credit hours]
An initial in-depth study of methods and materials for teaching and learning Mathematics in middle and secondary classrooms with emphasis on planning, content standards and instructional strategies that attend to students as learners; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6230
Term Offered: Fall

CI 6140 Science Methods of Teaching
[3 credit hours]
An initial in-depth study of methods and materials for teaching and learning Science in middle and secondary classrooms with emphasis on planning, content standards and instructional strategies that attend to students as learnners; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Term Offered: Fall

CI 6150 Advanced Methods of Teaching in Language Arts
[3 credit hours]
A continued in-depth study of methods and materials for teaching and learning the English Language Arts in middle and secondary classrooms with an emphasis on academic language and classroom level assessments; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6110 with a minimum grade of C or CI 6120 with a minimum grade of C or CI 6130 with a minimum grade of C or CI 6140 with a minimum grade of C
Corequisites: CI 6250
Term Offered: Spring

CI 6160 Social Studies Advanced Methods of Teaching
[3 credit hours]
A continued in-depth study of methods and materials for teaching and learning Social Studies in middle and secondary classrooms with an emphasis on academic language and classroom level assessments; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6110 with a minimum grade of C or CI 6120 with a minimum grade of C or CI 6130 with a minimum grade of C or CI 6140 with a minimum grade of C
Corequisites: CI 6260
Term Offered: Spring

CI 6170 Mathematics Advanced Methods of Teaching
[3 credit hours]
A continued in-depth study of methods and materials for teaching and learning Mathematics in middle and secondary classrooms with an emphasis on academic language and classroom level assessments; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6110 with a minimum grade of C or CI 6120 with a minimum grade of C or CI 6140 with a minimum grade of C or CI 6130 with a minimum grade of C
Corequisites: CI 6270
Term Offered: Spring

CI 6180 Science Advanced Methods of Teaching
[3 credit hours]
A continued in-depth study of methods and materials for teaching and learning Science in middle and secondary classrooms with an emphasis on academic language and classroom level assessments; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6120 with a minimum grade of C or CI 6130 with a minimum grade of C or CI 6140 with a minimum grade of C
Corequisites: CI 6280
Term Offered: Spring

CI 6190 Ambitious Teaching in PK-12 Classrooms
[3 credit hours]
Designed for graduate students studying teaching and learning, this course explores current ideas about ambitious and culturally responsive PK-12 teaching and a teacher's role in the classroom. Ideas underlying dilemmas of teaching subject matter for all learners will be examined within student-authored cases of teaching. Students reflect on their experiences in the classroom to examine their personal role as an ambitious PK-12 classroom teacher.
Term Offered: Spring, Fall

CI 6210 Practicum in Teaching Language Arts
[1 credit hour]
Initial field experience for LAMP Middle Childhood and Adolescent to Young Adult licensure only; experiences include focused observations in classroom settings, co-teaching with mentor teacher and the design, planning and teaching of units that integrate the English Language Arts. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6110
Term Offered: Fall

CI 6220 Practicum in Teaching Social Studies
[1 credit hour]
Initial field experience for LAMP Middle Childhood and Adolescent to Young Adult licensure only; experiences include focused observations in classroom settings, co-teaching with mentor teacher and the design, planning and teaching of units that integrate Social Studies. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6120
Term Offered: Fall

CI 6230 Practicum in Teaching Mathematics
[1 credit hour]
Initial field experience for LAMP Middle Childhood and Adolescent to Young Adult licensure only, experiences include focused observations in classroom settings, co-teaching with mentor teacher and the design, planning and teaching of units that integrate Mathematics. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6130
Term Offered: Fall

CI 6240 Practicum in Teaching Science
[1 credit hour]
Initial field experience for LAMP Middle Childhood and Adolescent to Young Adult licensure only; experiences include focused observations in classroom settings, co-teaching with mentor teacher and the design, planning and teaching of units that integrate Science. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6140
Term Offered: Fall

CI 6250 Internship/Student Teaching in Language Arts
[4 credit hours]
Part 1 of full time, supervised classroom teaching; for LAMP middle childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6210 with a minimum grade of C or CI 6220 with a minimum grade of C or CI 6230 with a minimum grade of C or CI 6240 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CI 6260 Internship/Student Teaching in Social Studies
[4 credit hours]
Part 1 of full time, supervised classroom teaching; for LAMP middle childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6210 with a minimum grade of C or CI 6220 with a minimum grade of C or CI 6230 with a minimum grade of C or CI 6240 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CI 6270 Internship/Student Teaching in Mathematics
[4 credit hours]
Part 1 of full time, supervised classroom teaching; for LAMP middle childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6210 with a minimum grade of C or CI 6220 with a minimum grade of C or CI 6230 with a minimum grade of C or CI 6240 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CI 6280 Internship/Student Teaching in Science
[4 credit hours]
Part 1 of full time, supervised classroom teaching; for LAMP middle childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6210 with a minimum grade of C or CI 6220 with a minimum grade of C or CI 6230 with a minimum grade of C or CI 6240 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CI 6300 Seminar in Student Teaching
[1 credit hour]
This seminar course meets throughout the semester along with the student teaching internship to provide discussion and guidance for the LAMP student teaching experience.
Corequisites: CI 6250, CI 6260, CI 6270, CI 6280, CI 6320, CIEC 6940, SPED 6330
Term Offered: Spring

CI 6310 Practicum in Teaching Foreign Language
[1 credit hour]
Initial field experience for LAMP Middle Childhood and Adolescent to Young Adult licensure only; experiences include focused observations in classroom settings, co-teaching with a mentor teacher, and the design, planning, and teaching of units that integrate Foreign Language.
Corequisites: SPAN 5120
Term Offered: Fall

CI 6320 Internship/Student Teaching in Foreign Language
[4 credit hours]
Part 1 of full time, supervised classroom teaching; for LAMP middle childhood and AYA licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6310 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CI 6370 Fundamentals Of Grant Writing
[3 credit hours]
This seminar teaches participants about fundamentals of grant writing. Topics covered include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.
Term Offered: Spring, Summer

CI 6400 Trends In Literacy Acquisition
[3 credit hours]
Study of the theories and foundational components of literacy acquisition and instruction aligned with the Science of Reading. Issues for learners from diverse backgrounds including English Language Learners and those who have dyslexia are examined.
Term Offered: Fall

CI 6410 Content Area Literacy
[3 credit hours]
Study of the integration of reading and writing in the content areas. Attention to both content area literacy approaches and disciplinary literacy practices. Consideration of needs of diverse learners including English Language Learners.
Term Offered: Spring, Summer, Fall

CI 6430 Diagnosis Of Reading Disability
[3 credit hours]
Teachers acquire the knowledge and skills needed to assess the reading and writing of students and to plan appropriate instruction. Emphasis on phonemic awareness, concepts of print, word recognition, fluency, comprehension, word study, and writing.
Prerequisites: CI 6400 with a minimum grade of C
Term Offered: Spring, Summer, Fall

CI 6440 Remediation Practicum
[3 credit hours]
In this course, participants engage in systematic, explicit and evidence-based literacy tutoring of learners across K#12 grades. Additionally, participants engage in the planning and enactment of professional development with other educators related to the conduct of remedial tutoring.
Prerequisites: (CI 6400 with a minimum grade of C and CI 6430 with a minimum grade of C)
Term Offered: Spring

CI 6490 Theory And Research In Literacy
[3 credit hours]
Extensive examination of current research and theoretical considerations in language and literacy learning and instruction. Contemporary contextual factors such as policy and standards are explored. The reciprocal nature of research and practice is a central theme of the course. Individualized culminating projects focus on specific issues of interest related to language and literacy learning and instruction.
Term Offered: Spring, Summer, Fall

CI 6590 Theory And Research In Mathematics Education
[3 credit hours]
Critical appraisal of current theory and research in mathematics education. Emphasis on issues related to teacher practice, student learning, and curriculum development.
Term Offered: Spring, Summer, Fall

CI 6650 Teacher Learning and Education
[3 credit hours]
Designed for future teacher educators and teacher leaders, students investigate frameworks for teacher professional knowledge including pedagogical content knowledge, teacher learning, educative mentoring, and program design. Teacher educators' roles as leaders for teacher learning and improvement are examined.

CI 6690 Theory And Research In Science Education
[3 credit hours]
Designed for individuals beginning their thesis, project, or seminar paper phase of their graduate program, this course explores both theory and research in science education. Based on an area of interest, students review and critically analyze the research literature in science education. Students also learn how to find primary sources, read and critique research, and organize and write a literature review.
Term Offered: Spring, Summer, Fall

CI 6730 Curriculum, Assessment, and Instruction
[3 credit hours]
In this course, students explore the connection between state standards, objectives, assessment, and instruction. This course would be designed for students who are in the classroom or have some exposure to K-12 classrooms. This course is a deep dive into backwards planning, choosing standards, developing assessments, and a focus on instruction.
Term Offered: Spring

CI 6790 Theory And Research In Social Studies
[3 credit hours]
Intensive study of research and theoretical considerations related to the development and current status of learning and instruction in the social studies. Historical and contemporary contextual factors such as policy and standards are explored. The reciprocal nature of research and practice is a central theme of the course. Individualized culminating projects focus on issues related to learning and instruction in the social studies.
Term Offered: Spring, Fall

CI 6800 Foundations Of Curriculum & Instruction
[3 credit hours]
The purpose of CI 6800/8800, Foundations of Curriculum, is to provide an introduction to the foundational areas that affect the design and development of curriculum. This includes the history, social forces, philosophy, and psychology behind many of the curriculum practices and issues that exist in schools today as well as the nature of the curriculum development process. As a result, the course is designed to increase the learner's awareness of the field of curriculum and to introduce specific skills in design and development.
Term Offered: Summer, Fall

CI 6810 Curriculum Development: K-12
[3 credit hours]
The purpose of CI 6810/8810, Curriculum Development: K-12, is to provide appropriate background information and practice in curriculum and instructional design and direct experiences in approaching this process imaginatively. The course will focus on how to use both traditional and emerging models of curriculum design and development to create a working curriculum and to design instructional based on research-based theories of learning and models of teaching.
Term Offered: Spring, Fall

CI 6830 Curriculum Trends And Issues
[3 credit hours]
Designed for advanced students of education, this course guides students in exploring core ideas to develop a framework for the study of teaching. Students investigate issues of what and how to teach in the content areas as well as explore the knowledge of expert content teachers. As a core graduate course in curriculum and instruction, students analyze and integrate ideas to form a theoretical framework and are guided in developing professional written work grounded in the literature. Students explore questions and approaches for research on content teaching.
Term Offered: Spring, Summer, Fall

CI 6840 Curriculum For Educational Leaders
[3 credit hours]
The purpose of this course is to introduce educational leaders to research-based leadership theories and principles and how these apply to P-12 school settings. Building principals, teacher leaders, and instructional coaches will focus on creating learning environments throughout the school that increase teacher effectiveness, utilize alternative assessment strategies, and focus on connecting curriculum, instruction and assessment in all classrooms.
Term Offered: Spring, Fall

CI 6890 Theory and Research in Learning and Teaching Content
[3 credit hours]
A critical analysis of the research literature in language arts, mathematics, science, or social studies education. Students examine educational research regarding ideas about learning and teaching that influence research, finding primary sources, reading and critiquing research, and organizing and writing a literature review.
Term Offered: Spring, Summer, Fall

CI 6900 Master's Culminating Seminar In Teacher Education
[1-3 credit hours]
This seminar is the master's culminating experience for students studying teaching and learning. This course is completed in three stages with a focus on the preparation and submission of a professional manuscript for publication in Learning to Teach Language Arts, Mathematics, Science, and Social Studies Through Research and Practice. Students identify a problem for practice, review professional resources, and present well-formed message orally and in writing.
Term Offered: Spring, Summer, Fall

CI 6920 Masters Research Project In Curriculum And Instruction
[1-3 credit hours]
Students will complete an individual research project under the direction of a committee of at least two faculty members in Curriculum and Instruction, ordinarily including the faculty adviser.
Term Offered: Spring, Summer, Fall

CI 6950 Internship Capstone
[1 credit hour]
Part 2 of full time, supervised classroom teaching; for LAMP middle childhood and Adolescent to Young Adult licensure only; added emphasis on continual professional growth and development as educators. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6250 with a minimum grade of C or CI 6260 with a minimum grade of C or CI 6270 with a minimum grade of C or CI 6280 with a minimum grade of C or CI 6320 with a minimum grade of C
Term Offered: Spring, Summer, Fall

CI 6960 Masters Thesis In Curriculum And Instruction
[1-3 credit hours]
Students will complete a thesis under the direction of committee of at least two faculty members from Curriculum and Instruction, ordinarily including the faculty adviser.
Term Offered: Spring, Summer, Fall

CI 7940 Specialist Practicum In Curriculum And Instruction
[1-3 credit hours]
Observation and supervised experience in an appropriate setting. This experience may be in a school or other educational setting. Student will study under the supervision of appropriate mentors or advisors.
Term Offered: Spring, Summer, Fall

CI 7980 Special Topics In Curriculum & Instruction
[1-5 credit hours]
A course developed around topics of interest and concern to educators.
Term Offered: Spring, Summer, Fall

CI 8370 Fundamentals Of Grant Writing
[3 credit hours]
This seminar teaches participants about fundamentals of grant writing. Topics covered include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.
Term Offered: Spring, Summer

CI 8400 Trends In Literacy Acquisition
[3 credit hours]
Study of the theories and foundational components of literacy acquisition and instruction aligned with the Science of Reading. Issues for learners from diverse backgrounds including English Language Learners and those who have dyslexia are examined.
Term Offered: Fall

CI 8410 Content Area Literacy
[3 credit hours]
Study of the integration of reading and writing in the content areas. Attention to both content area literacy approaches and disciplinary literacy practices. Consideration of needs of diverse learners including English Language Learners.
Term Offered: Spring, Summer, Fall

CI 8430 Diagnosis Of Reading Disability
[3 credit hours]
Teachers acquire the knowledge and skills needed to assess the reading and writing of students and to plan appropriate instruction. Emphasis on phonemic awareness, concepts of print, word recognition, fluency, comprehension, word study, and writing.
Prerequisites: CI 6400 with a minimum grade of C
Term Offered: Spring, Summer, Fall

CI 8440 Remediation Practicum
[3 credit hours]
In this course, participants engage in systematic, explicit and evidence-based literacy tutoring of learners across K#12 grades. Additionally, participants engage in the planning and enactment of professional development with other educators related to the conduct of remedial tutoring.
Prerequisites: (CI 6400 with a minimum grade of C and CI 6430 with a minimum grade of C)
Term Offered: Spring

CI 8490 Theory And Research In Literacy
[3 credit hours]
Extensive examination of current research and theoretical considerations in language and literacy learning and instruction. Contemporary contextual factors such as policy and standards are explored. The reciprocal nature of research and practice is a central theme of the course. Individualized culminating projects focus on specific issues of interest related to language and literacy learning and instruction.
Term Offered: Spring, Summer, Fall

CI 8590 Theory And Research In Mathematics Education
[3 credit hours]
Critical appraisal of current theory and research in mathematics education. Emphasis on issues related to teacher practice, student learning, and curriculum development.
Term Offered: Spring, Summer, Fall

CI 8650 Teacher Learning and Education
[3 credit hours]
Designed for future teacher educators and teacher leaders, students investigate frameworks for teacher professional knowledge including pedagogical content knowledge, teacher learning, educative mentoring, and program design. Teacher educators' roles as leaders for teacher learning and improvement are examined.

CI 8690 Theory And Research In Science Education
[3 credit hours]
Designed for individuals beginning their thesis, project, or seminar paper phase of their graduate program, this course explores both theory and research in science education. Based on an area of interest, students review and critically analyze the research literature in science education. Students also learn how to find primary sources, read and critique research, and organize and write a literature review.
Term Offered: Spring, Summer, Fall

CI 8700 Doctoral Pro-Seminar I: Introduction to Scholarship in Curriculum and Instruction
[3 credit hours]
The doctoral research cycle begins by introducing students to issues in curriculum and instruction, establishing a research agenda, and building a community of scholars. Pre-requisite to Pro-Seminar II.
Term Offered: Spring, Fall

CI 8710 Doctoral Pro-Seminar II: Themes in theory and research in Curriculum and Instruction
[3 credit hours]
The doctoral research cycle continues by examining the paradigmatic and theoretical bases of C&I research. Develop lines of inquiry grounded in theoretical knowledge and personal interests. Prerequisite: Pro-Seminar I.
Prerequisites: CI 8700 with a minimum grade of D-
Term Offered: Spring, Summer

CI 8720 Doctoral Pro-Seminar III: Themes in theory and research in curriculum and instruction.
[3 credit hours]
The doctoral research cycle is completed. A study is designed, conducted and disseminated within a research group under the guidance of a mentor. Prerequisite: CI 8700 + 8710.
Prerequisites: CI 8710 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

CI 8790 Theory And Research In Social Studies
[3 credit hours]
Intensive study of research and theoretical considerations related to the development and current status of learning and instruction in the social studies. Historical and contemporary contextual factors such as policy and standards are explored. The reciprocal nature of research and practice is a central theme of the course. Individualized culminating projects focus on issues related to learning and instruction in the social studies.
Term Offered: Spring, Fall

CI 8800 Foundations Of Curriculum & Instruction
[3 credit hours]
The purpose of CI 6800/8800, Foundations of Curriculum, is to provide an introduction to the foundational areas that affect the design and development of curriculum. This includes the history, social forces, philosophy, and psychology behind many of the curriculum practices and issues that exist in schools today as well as the nature of the curriculum development process. As a result, the course is designed to increase the learner's awareness of the field of curriculum and to introduce specific skills in design and development.
Term Offered: Spring, Summer, Fall

CI 8810 Curriculum Development: K-12
[3 credit hours]
The purpose of CI 6810/8810, Curriculum Development: K-12, is to provide appropriate background information and practice in curriculum and instructional design and direct experiences in approaching this process imaginatively. The course will focus on how to use both traditional and emerging models of curriculum design and development to create a working curriculum and to design instructional based on research-based theories of learning and models of teaching.
Term Offered: Spring, Fall

CI 8830 Curriculum Trends And Issues
[3 credit hours]
Designed for advanced students of education, this course guides students in exploring core ideas to develop a framework for the study of teaching. Students investigate issues of what and how to teach in the content areas as well as explore the knowledge of expert content teachers. As a core graduate course in curriculum and instruction, students analyze and integrate ideas to form a theoretical framework and are guided in developing professional written work grounded in the literature. Students explore questions and approaches for research on content teaching.
Term Offered: Spring, Summer, Fall

CI 8840 Curriculum For Educational Leaders
[3 credit hours]
The purpose of this course is to introduce educational leaders to research-based leadership theories and principles and how these apply to P-12 school settings. Building principals, teacher leaders, and instructional coaches will focus on creating learning environments throughout the school that increase teacher effectiveness, utilize alternative assessment strategies, and focus on connecting curriculum, instruction and assessment in all classrooms.
Term Offered: Spring, Fall

CI 8860 Advanced Curriculum Theory
[3 credit hours]
This course is designed to build on the foundational concepts and principles introduced in CI 6800/8800 and to explore, analyze and evaluate curriculum theory as it applies to curriculum studies as a discipline. This course will explore curriculum theory as a "complicated conversation" led by educators with the knowledge of contemporary social issues, history, philosophy and popular culture. The course will analyze and evaluate modernist and postmodern theories and practices and engage students with readings, discussions, and interactions with influential curriculum theorists.
Term Offered: Spring, Fall

CI 8900 Doctoral Seminar In Curriculum And Instruction
[2-4 credit hours]
This seminar will consider problems and provide advanced study for doctoral students in Curriculum and Instruction.
Term Offered: Spring, Summer, Fall

CI 8930 Independent Research In Curriculum And Instruction
[1-5 credit hours]
Individual study is designed to provide the doctoral student opportunity to work individually on professional problems under the direction of CI faculty.
Term Offered: Spring, Summer, Fall

CI 8940 Doctoral Internship In Curriculum And Instruction
[1-3 credit hours]
Placement of doctoral students in appropriate school, school district, or other professional setting under direction of appropriate mentors or advisors.
Term Offered: Spring, Fall

CI 8960 Dissertation In Curriculum And Instruction
[1-10 credit hours]
Original research in an area of curriculum and instruction.
Term Offered: Spring, Summer, Fall

CIEC 5000 Ece: Philosophy And Practice
[3 credit hours]
A comprehensive introduction to the profession of early childhood education by examining relevant issues as they relate to overall development of children ages birth to eight years.
Term Offered: Spring, Summer, Fall

CIEC 5070 Effective Teaching Practices, Pre-K To 3rd Grade
[3 credit hours]
This course is designed to apply characteristics of best practice to curriculum development and implementation with adherence to the national and state curriculum standards as they apply to children, age 3 to 8, with diverse educational needs.
Prerequisites: Upper Division with a score of 1
Corequisites: CIEC 3380
Term Offered: Spring, Fall

CIEC 5150 Setting The Stage For Early Childhood Learning: Inspirations From Reggio Emilia
[3 credit hours]
This course will explore Reggio's philosophy of early childhood education and the numerous ways that children explore the "hundred languages." Reggio uses these languages (art, clay, wire, sculpture, light, shadow, etc.) as a way to help children represent their world and what they know about it.
Term Offered: Spring, Summer

CIEC 5340 Infant/Toddler Curriculum
[3 credit hours]
Introduction to the sequential development of the young child from birth to 3 years. Students will engage in field hours in infant-toddler settings, design learning materials and critique research in topics related to infant/toddler curriculum.
Term Offered: Spring, Summer, Fall

CIEC 5350 Public Policy And Advocacy In Early Childhood Education
[3 credit hours]
Students will understand the implications of social, political and economic policies on the emergence of services for young children in the 21st century.
Prerequisites: CIEC 5000 with a minimum grade of C
Term Offered: Spring, Summer, Fall

CIEC 5380 Field Experience Cohort I
[3 credit hours]
This course aligns with the graduate Cohort II coursework (CIEC 5070).
Prerequisites: EDP 5210 with a minimum grade of C
Corequisites: CIEC 5070
Term Offered: Spring, Fall

CIEC 5460 Science Methods For Early Childhood Education
[3 credit hours]
This course is designed to help teachers of science in grades Pre-Kindergarten through third to understand the concepts, ideas and applications of science in the real world. Students will learn how scientific thinking involves collecting data, analyzing data, making decisions and taking action based on those decisions. Students will learn how to plan effective science experience for young children that cause them to explore environments and act upon their descoveries. Students will learn how to assess the scientific thinking of young children appropriately, using formal and infornal strategies.
Term Offered: Spring, Fall

CIEC 5480 Practicum I
[1 credit hour]
Practicum is a supervised opportunity for students to gain experience in the classroom and other settings that provide instruction to children in a Kindergarten through 5th grade classroom. Students will focus on lesson plan implementation, differentiated instruction, behavior management strategies and assessment of student learning. The course further assists students in acquiring the necessary knowledge and skills needed to function as an educator in a changing and diverse society. Furthermore, activities will assist students in the field of primary education to: understand learners and the learning processes; gain experience using of instructional technology necessary for professional practice; work effectively in both professional and community roles. Students in this practicum will focus their planning on Literacy, Reading Development, Phonics and Science content standards, while practicing integrated curricular design and developmentally appropriate practices for children in Kindergarten through 5th grade.
Corequisites: CIEC 5460
Term Offered: Spring, Fall

CIEC 5520 Multisensory Experiences
[3 credit hours]
Development and sensory principles underlying the planning and implementation of developmentally appropriate learning activities for young children. Technical content will include the physical and neurological bases for learning.

CIEC 5550 Teaching Methods For Early Childhood Social Studies
[3 credit hours]
In depth study of methods and materials for teaching social studies from pre-school to third grade. Implementation of early childhood curriculum within the context of current technology and the development of critical thinking skills.
Prerequisites: CIEC 5460 with a minimum grade of C
Corequisites: CIEC 5770
Term Offered: Spring, Fall

CIEC 5770 Practicum II
[1 credit hour]
Practicum is a supervised opportunity for students to gain experience in the classroom and other settings that provide instruction to children in an early childhood setting. Students will focus on lesson plan implementation, differentiated instruction, behavior management strategies and assessment of student learning in their practicums. The course further assists students in acquiring the necessary knowledge and skills needed to function as an educator in a changing and diverse society. Furthermore, activities will assist students in the field of primary education to: understand learners and the learning processes; gain experience using of instructional technology necessary for professional practice; work effectively in both professional and community roles.
Prerequisites: CIEC 5480 with a minimum grade of C
Corequisites: CIEC 5550
Term Offered: Spring, Fall

CIEC 5980 Special Topics In Early Childhood Education
[1-5 credit hours]
A course developed around topics of interest and concern to inservice teachers within districts served by the Center for Educational Research and Services. Stresses solution and resolution of educational problems occurring within the district.
Term Offered: Spring, Summer, Fall

CIEC 5990 Graduate Independent Study In Early Childhood Education
[1-5 credit hours]
Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of the faculty in Early Childhood Education.
Term Offered: Spring, Summer, Fall

CIEC 6310 Pre-K/Primary Curriculum
[3 credit hours]
The study and design of early childhood curriculum from a best practice/developmental perspective including integrated curriculum, anti-bias approaches, authentic assessment, direct learning strategies. Student self assessment and change project required.
Term Offered: Spring, Fall

CIEC 6320 Meaning And Development Of Play Behavior
[3 credit hours]
Theoretical bases of play behavior and its role in curriculum development/assessment. Students implement and evaluate a sociodramatic play kit and conduct library research on one aspect of play behavior.
Term Offered: Spring, Summer

CIEC 6330 Language And Concept Development
[3 credit hours]
Study of the language and literacy development of the young child with emphasis upon the factors that influence and support this development. Students will do projects to implement their learning.
Term Offered: Spring, Summer, Fall

CIEC 6750 Developmental And Classroom Assessment
[3 credit hours]
Focuses upon teaching and learning in a developmental learning environment. Emphases includes observing the developmental characteristics of young children and assessment for prescriptive teaching.
Term Offered: Spring, Summer, Fall

CIEC 6900 Masters Research Seminar In Early Childhood Educaton
[2-3 credit hours]
Examination of research and current issues in early childhood education. Emphasis on theory and research and evaluation models.
Prerequisites: CIEC 6950 with a minimum grade of C
Term Offered: Spring

CIEC 6920 Masters Research Project In Early Childhood Education
[1-3 credit hours]
Student will complete an individual research project under the direction of a committee of at least two faculty members in Early Childhood ordinarily involving the faculty advisor.

CIEC 6940 Internship/Student Teaching In Primary Education
[4 credit hours]
Internship is a supervised opportunity for students to gain experience in the classroom and other settings that provide instruction to children in an primary education setting. Students will focus on lesson plan implementation, differentiated instruction, behavior management strategies and assessment of student learning in their internships. The course further assists students in acquiring the necessary knowledge and skills needed to function as an educator in a changing and diverse society. Furthermore, activities will assist students in the field of primary education to: understand learners and the learning processes; gain experience using of instructional technology necessary for professional practice; work effectively in both professional and community roles.
Prerequisites: CIEC 5770 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CIEC 6950 Theory And Research In Early Childhood
[3 credit hours]
Review and analysis of theory and research related to rationale and methods for program options for young children. Critique research and prepare a review of synthesis of research.
Term Offered: Fall

CIEC 8310 Pre-K/Primary Curriculum
[3 credit hours]
The study and design of early childhood curriculum from a best practice/developmental perspective including integrated curriculum, anti-bias approaches, authentic assessment, direct learning strategies. Student self assessment and change project required.
Term Offered: Spring, Fall

CIEC 8320 Meaning And Development Of Play Behavior
[3 credit hours]
Theoretical bases of play behavior and its role in curriculum development/assessment. Students implement and evaluate a sociodramatic play kit and conduct library research on one aspect of play behavior.
Term Offered: Spring, Summer

CIEC 8330 Language And Concept Development
[3 credit hours]
Study of the language and literacy development of the young child with emphasis upon the factors that influence and support this development. Students will do projects to implement their learning.
Term Offered: Spring, Summer, Fall

CIEC 8750 Developmental And Classroom Assessment
[3 credit hours]
Focuses upon teaching and learning in a developmental learning environment. Emphases includes observing the developmental characteristics of young children and assessment for prescriptive teaching.
Term Offered: Spring, Summer, Fall

CIEC 8900 Doctoral Seminar In Early Childhood Education
[2-4 credit hours]
This seminar will consider problems and provide advanced study for doctoral students in Early Childhood Education.
Term Offered: Spring, Fall

CIEC 8930 Independent Research In Early Childhood Education
[1-5 credit hours]
Individual study is designed to provide the doctoral student opportunity to work individually on professional problems under the direction of Early Childhood faculty.
Term Offered: Spring, Summer, Fall

CIEC 8950 Theory And Research In Early Childhood
[3 credit hours]
Review and analysis of theory and research related to rationale and methods for program options for young children. Critique research and prepare a review of synthesis of research.

CIEC 8960 Dissertation In Early Childhood Education
[1-12 credit hours]
Original research in an area of early childhood education.
Term Offered: Spring, Summer, Fall

CTE 5010 Teaching Occupational Skills
[3 credit hours]
This course is required for the Health Careers, Career-Technical Education and the six Career-Technical Licenses. This course addresses multiple topics critical to workforce education as they apply to the laboratory environment. Students are provided classroom and clinical experiences designed to assist the beginning teacher with basic laboratory instructional techniques and management strategies that integrate academic, occupational and employability skills in a contextual framework.
Term Offered: Summer

CTE 5020 Occupational Safety And Liability
[3 credit hours]
This course is required for the Adult Education, Career Based Intervention, and Work-Site Teacher/Coordinator endorsements. Occupational health and safety hazards applicable to school, business, and industry, will be examined. Utilizing clinical and classroom experiences students will investigate: the rationale for safety training; strategies to minimize exposure and prevent injuries; specific topics, such as ergonomics, blood borne pathogens, air quality, sound, hazardous materials, back safety, substance abuse, violence in the workplace, etc.
Term Offered: Spring, Summer

CTE 5030 Teaching Occupational Knowledge
[3 credit hours]
This course is required for the Health Careers, Career-Technical Education and the six Career-Technical Licenses. Designed as a co-requisite in the professional education series, this course addresses multiple topics critical to workforce education as they apply to the classroom environment. Students are provided classroom and clinical experiences designed to assist the beginning teacher with basic classroom instructional techniques and management strategies that integrate academic, occupational and employability skills in a contextual framework.
Term Offered: Summer

CTE 5050 Methods Of Teaching Career And Technical Education I
[3 credit hours]
The pedagogical and management skills introduced in CTE 4010 and CTE 4030 (Summer Workshop) are integrated in an applied setting such as a classroom. Learning profiles; employability skills; community partnerships; school-based and work site learning are foundational for student research, reflection, and inquiry. Students are required to develop and apply pedagogical and management skills related to the career technology setting. During these applications, students will be cognizant of and sensitive to issues of diversity, equity and special populations.
Term Offered: Spring, Fall

CTE 5070 Methods Of Teaching Career And Technical Education II
[3 credit hours]
The pedagogical and management skills introduced in CTE 4050 are integrated in an applied setting such as a classroom. Learning profiles; employability skills; community partnerships; school-based and work site learning are foundational for student research, reflection, and inquiry. Students are required to develop and apply pedagogical and management skills related to the career technology setting. During these applications, students will be cognizant of and sensitive to issues of diversity, equity and special populations.
Term Offered: Spring, Fall

CTE 5080 Principles Of School-To-work Transition
[3 credit hours]
Design for educators and employers to increase their knowledge and skill to build partnerships between schools and business, industry and labor. Examines transition concepts, components, implementation strategies and models.
Term Offered: Summer

CTE 5110 CTE Program Guidance and Trends
[3 credit hours]
The career-technical education teacher is an occupational professional who possesses the pedagogical knowledge and reflective decision-making skills necessary to enter the teaching profession at multiple levels. In order to prepare individuals as career-technical instructors, components of the licensure program were developed and approved by the State Board of Education, to promote high professional standards to provide quality classroom teachers. The components necessary to meet these standards are: a clear mission; operational goals; specific competencies of an assessment system and the latest trends in Career and Technical Education.
Term Offered: Spring

CTE 5140 Cooperative Education
[3 credit hours]
This course is required for the Career Based Intervention. The course is designed to present the basic fundamentals of establishing and operating a cooperative occupational program. Students investigate and develop operational procedures to address: student selection; assessing the quality of potential training stations; student placement; school-based learning; critical issues related to work-based learning; critical issues related to work-based learning; minor labor laws; partnering with parents, business, and labor; connecting activities; record keeping; evaluation techniques; etc.
Term Offered: Fall

CTE 5160 Curriculum Development & Teaching
[3 credit hours]
This course is required for the Career Based Intervention. Designed as a study of cooperative education curriculum and instructional methods, the course includes the coordination of school-based instruction with on-the-job work-based experience. Learning styles of diverse students; instructional planning and delivery; classroom management; integrated academics; authentic assessment; safety and liability issues; employability and SCANS skills; community partnerships; school-based and work-site learning; etc. are the basis for student research, reflection, and inquiry.
Term Offered: Spring, Summer

CTE 5180 Promotion, Recruitment & Retention
[3 credit hours]
A study of career and technical education in the community, and promotion, recruitment and retention strategies, including school publics, theories of community power structure and the career and technical school in a democratic society.
Term Offered: Summer, Fall

CTE 5900 Curriculum Construction in Career and Technical Education
[3 credit hours]
This course is a study of occupational analysis and course of study assembly. Occupational instructors will be assisted to conduct program analysis and develop course content through a systematic process.
Term Offered: Fall

CTE 5930 Supervised Teaching
[3 credit hours]
A planned field experience held in public school classrooms under the direction of University Supervisors. Practicing teacher observed planning, presenting and demonstrating teaching skills and managing the laboratory and classroom. During this planned three (3) semester hours the University of Toledo instructor will visit the classroom and laboratory for practical teacher observation.
Term Offered: Spring, Fall

CTE 5990 Individual Study In Career And Technical Education
[1-3 credit hours]
Individual study is designed to provide the opportunity to work individually on professional problems under the direction of the faculty in career and technical education.
Term Offered: Spring, Summer, Fall

CTE 6900 Research Seminar In Career And Technical Education
[3 credit hours]
This course is required for the master's program in Career & Technical Education. Students will undertake an individual research project guided by their career and technical education advisor.
Term Offered: Spring, Fall

CTE 6920 Master's Research Project In Career And Technical Education
[1-3 credit hours]
Open to a graduate student who elects the completion of a research project in fulfilling the research requirement of the master's degree.
Term Offered: Spring

SPED 5000 Issues In Special Education
[3 credit hours]
Examination of causes and characteristics, identification procedures, and potential of learners who significantly deviate from the norm mentally, physically and behaviorally. Issues related to services for persons with disabilities will be studied.
Term Offered: Spring, Summer, Fall

SPED 5010 Atypical Development In Early Childhood: Implications For Development
[3 credit hours]
Factors that contribute to atypical development in early childhood, appropriate intervention models and implications of delay on young children's development. The focus will be on conditions that may result in eligibility of children for early intervention and/or special education services in infancy (0-2), in the preschool (3-5) and primary grade (K-3) years (ages 5 to 8).
Term Offered: Summer, Fall

SPED 5080 Curriculum Adaptations & Strategies In Early Childhood Education
[3 credit hours]
Curriculum models and intervention strategies which facilitate the cognitive, academic, social, language, self-help and lay skills of children with disabilities in preschool and primary grades will be examined.
Prerequisites: Upper Division with a score of 1
Term Offered: Spring, Fall

SPED 5150 Advanced Practicum For Teaching Students With Moderate Educational Needs
[1 credit hour]
This course is taken with SPED 5160 to apply strategies and techniques for teaching students with moderate educational needs. Forty hours of required field.
Corequisites: SPED 5160
Term Offered: Spring, Fall

SPED 5160 Advanced Instructional Methods For Teaching Students With Moderate Educational Needs
[3 credit hours]
This course focuses on a community-referenced functional curricula approach to teaching children and youths with moderate to severe delays. An in-depth study of inclusionary activities, community-based instruction, social skills.

SPED 5170 Partnerships in Transition Planning
[3 credit hours]
An in-depth study of strategies for linking young adults with disabilities to avenues leading to productive and fulfilling employment. Supported/customized employment and the development of successful business partnerships to create jobs and careers for young adults with disabilities will be addressed. This course requires 20 hours of field experience.
Term Offered: Fall

SPED 5180 Advanced Instructional Methods For Teaching Students With Intensive Educational Needs
[3 credit hours]
An in-depth examination of appropriate curriculum models, instructional strategies and adaptations, and related behavior problems for students with severe and multiple disabilities. A transdiciplinary team approach is explored.
Term Offered: Spring

SPED 5190 Practicum II - Intensive Needs
[1 credit hour]
This course is to apply strategies and techniques for teaching students with intensive needs.
Corequisites: SPED 5180
Term Offered: Spring

SPED 5210 Augmentative and Alternative Communication
[3 credit hours]
This course will provide an overview of alternative or augmentative modes of communication for children who are unable to meet their daily communication needs through natural modes such as speech, gestures or handwriting. It will provide a broad overview of AAC and its application, along with the history and terminology.
Term Offered: Fall

SPED 5250 Assessment and Planning in Transition Education and Services
[3 credit hours]
The course examines the planning and programming that supports young adults with disabilities during their transition from school to adult life. The course will cover several issues in the area of transition, including models of transition, planning, evidence-based instruction, assessment, transition planning, and progress monitoring. This course requires 20 hours of field experience.
Term Offered: Fall

SPED 5260 Family And Professional Relations In Special Education
[3 credit hours]
Effective parent and professional partnerships will be explored. Interpersonal communication skills, legal issues, effective models for home-school communication, and differences in culture, values and family expectations will be discussed.
Term Offered: Summer, Fall

SPED 5270 Team Models And Community Networking In Early Intervention
[3 credit hours]
This course will focus on the skills, knowledge and ethical practices essential to the provision of effective service coordination and teaming for early intervention and early childhood special education. In addition, students will examine various models of teaming and consultation approaches and address issues related to working with individuals from cultural backgrounds other than their own.
Term Offered: Spring, Fall

SPED 5280 Management Of The Learning Environment In Early Childhood Special Education
[3 credit hours]
This class will provide an analysis of the various aspects of quality environments, in the home and early childhood centers for young children with special needs. Identifying characteristics of natural environments and designing interventions that promote positive child outcomes will be emphasized. A case study approach will be utilized. This course requires 50 hours of field experience.
Term Offered: Spring

SPED 5310 Advanced Instructional Methods For Teaching Students With Mild Educational Needs
[3 credit hours]
Theoretical considerations for designing instruction, lesson plan development using direct, explicit instructional approach, differentiation, co-teaching, and evidence-based practices to meet the needs of students with mild disabilities in school settings will be examined. Research-based approaches to teaching language arts, mathematics, science, and social studies, will be explored.
Term Offered: Spring, Fall

SPED 5320 Practicum II - Mild Needs
[1 credit hour]
Provides opportunities for field experience to use and refine the strategies for persons with mild disabilities.
Corequisites: SPED 5310
Term Offered: Spring, Fall

SPED 5340 Effective Management of Students with Special Needs in Educational Settings
[3 credit hours]
This course focuses on research-based strategies to promote appropriate behaviors and decrease challenging behaviors in classroom settings. Topics include the functions of behavior; designing preventative and management interventions for behaviors resistance to class-wide behavior supports; data collection; progress monitoring; and restorative, collaborative practices; and parent education addressing evidence-based practices appropriate in the home setting. A case-based approach will be used.
Term Offered: Spring

SPED 5380 Transition Process from High School to Post-Secondary Settings for Students w Disabilities
[3 credit hours]
This course prepares the pre-service special education interventionist to support students with disabilities during the transition from high school to post-secondary settings. The course will address several issues regarding transition, including legislation, assessment and planning, and evidence-based instructional strategies. Special emphasis will be placed on self-determination through self-advocacy.
Prerequisites: Upper Division with a score of 1
Term Offered: Spring, Fall

SPED 5980 Special Topics In Special Education
[1-5 credit hours]
An advanced course for graduate students in special education or related fields. Topics are selected based on needs of the population. Student may repeat this course under different section numbers.
Term Offered: Spring, Summer, Fall

SPED 5990 Independent Study In Special Education
[1-5 credit hours]
Individual study provides graduate students with opportunities to work individually on professional problems with faculty of the Depart of Special Education Services. Individual meetings with sponsoring faculty are held.
Term Offered: Spring, Summer, Fall

SPED 6070 Curriculum Models And Intervention Strategies In Early Childhood Special Education
[3 credit hours]
Atypical infant, toddler, and early childhood development will be examined. Specialized intervention techniques, their research and practice base and appropriate curriculum models will be explored.
Term Offered: Fall

SPED 6110 Practices of Teaching Learners with Exceptionalities
[3 credit hours]
This course is designed for candidates completing licensure. Teacher candidates will gain initial special education content that will assist in understanding students with exceptionalities and laws governing special education. In addition, teacher candidates will learn about the implementation of specially designed instruction for students with exceptionalities attending an inclusive classroom. This course will also focus on data collection, assessment, collaboration, and teaming.
Corequisites: SPED 6210
Term Offered: Fall

SPED 6130 Advanced Practices for Inclusive and Specialized Teaching
[3 credit hours]
This course is designed for candidates completing licensure and helps teacher candidates advance their practice. Continued content concentrating on the implementation of specially designed instruction for students with exceptionalities commonly attending an inclusive classroom will be continued. Additionally, data collection and assessment will be studied with respect to daily lesson planning, IEP writing, and behavioral management. IEP writing and functional behavior plans will be created based on a case study in the field. Collaboration and teaming with families will continue to be investigated.
Prerequisites: SPED 6110 with a minimum grade of C
Term Offered: Spring

SPED 6190 Policy, Context, and Hallmarks of Special Education
[3 credit hours]
This course is designed for candidates completing licensure. Teacher candidates will gain initial special education content that will assist in understanding students with exceptionalities and laws governing special education. In addition, teacher candidates will learn about the implementation of specially designed instruction for students with exceptionalities attending an inclusive classroom. This course will also focus on data collection, assessment, collaboration, and teaming.
Term Offered: Spring, Summer, Fall

SPED 6210 Practicum in Teaching Learners with Exceptionalities
[1 credit hour]
This course will provide directed practicum teaching experiences in general education (15 weeks) and special education (15 weeks) for candidates completing licensure. In this placement, teacher licensure candidates will use information about students' learning and performance to plan and deliver instruction that will close the achievement gap. They will create a learning environment that is physically and emotionally safe. Candidates will have the opportunity to work in educational settings with experienced teachers.
Corequisites: SPED 6110
Term Offered: Fall

SPED 6230 Internship in Inclusive and Specialized Teaching
[2 credit hours]
This course will provide directed planned field experiences in general education (15 weeks) and special education (15 weeks) for candidates completing licensure. In this placement, teacher licensure candidates will create learning situations in which students work independently and collaboratively in an environment that is respectful, supportive, and caring. Candidates will motivate students to work productively and assume responsibility for their own learning. Full responsibility for the classroom is expected by the end of the student teaching experience.
Prerequisites: SPED 6210 with a minimum grade of C
Corequisites: SPED 6130
Term Offered: Spring

SPED 6250 Issues and Research in Transition and Post-Secondary Outcomes for Students with Disabilities
[3 credit hours]
The course explores the history, ethics, legislation, case law, policy, and research that inform educational and programmatic decisions in the transition education field. This course requires 10 hours of field experience.
Term Offered: Spring

SPED 6330 Internship/Student Teaching for Intervention Specialist
[4 credit hours]
This course provides pre-service special education interventionists with a full-time student teaching experience with students with disabilities. Teaching experiences may occur in classrooms found within the continuum of placements, ranging from (not limited to) general education with consult to special schools. Full responsibility for the classroom is expected by the end of the student teaching experience.
Prerequisites: SPED 5320 with a minimum grade of C or SPED 5190 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

SPED 6900 Independent Research In Special Education
[1-5 credit hours]
Independent Research provides opportunities to work on individual research under the direction of faculty. The student meets with the instructor at intervals and conducts research without formal class meeting.

SPED 6920 Master's Research Project In Special Education
[1-5 credit hours]
The master's project is an individually designed product which meets the final activity requirement for completion of the masters degree.
Term Offered: Spring, Summer, Fall

SPED 6930 Seminars In Special Education
[1-5 credit hours]
Seminars will consider problems and provide advanced study in the field of Special Education. A student may register for more than one seminar during a graduate program.
Term Offered: Spring, Summer, Fall

SPED 6940 Internship/Externship In Special Education
[1-8 credit hours]
Provides the advanced graduate student with supervised practicum experiences at an off-campus site; including schools, hospitals, agencies, rehabilitation clinics, work training sites and other community sites where persons with disabilities are served.
Term Offered: Spring, Summer, Fall

SPED 6990 Independent Study In Special Education
[1-5 credit hours]
Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Department of Special Education Services. Individual meetings with sponsoring faculty are held.
Term Offered: Spring, Summer, Fall

SPED 7000 Issues In Special Education
[3 credit hours]
Examination of causes and characteristics, identification procedures, and potential of learners who significantly deviate from the norm mentally, physically and behaviorally. Issues related to services for persons with disabilities will be studied.
Term Offered: Spring, Summer, Fall

SPED 7150 Advanced Practicum For Teaching Students With Moderate Educational Needs
[1 credit hour]
This course is taken with SPED 5160 to apply strategies and techniques for teaching students with moderate educational needs. Forty hours of required field.
Term Offered: Spring

SPED 7160 Advanced Instructional Methods For Teaching Students With Moderate Educational Needs
[3 credit hours]
This course focuses on a community-referenced functional curricula approach to teaching children and youths with moderate to severe delays. An in-depth study of inclusionary activities, community-based instruction, social skills.
Term Offered: Spring, Fall

SPED 7170 Partnerships in Transition Planning
[3 credit hours]
An in-depth study of strategies for linking young adults with disabilities to avenues leading to productive and fulfilling employment. Supported/customized employment and the development of successful business partnerships to create jobs and careers for young adults with disabilities will be addressed. Leadership roles within the area of transition services will be emphasized.
Term Offered: Fall

SPED 7180 Advanced Instructional Methods For Teaching Students With Intensive Educational Needs
[3 credit hours]
An in-depth examination of appropriate curriculum models, instructional strategies and adaptations, and related behavior problems for students with severe and multiple disabilities. A transdiciplinary team approach is explored.
Term Offered: Spring

SPED 7190 Practicum II - Intensive Needs
[1 credit hour]
This course is to apply strategies and techniques for teaching students with intensive needs.
Corequisites: SPED 5180
Term Offered: Spring

SPED 7210 Augmentative and Alternative Communication
[3 credit hours]
This course will provide an overview of alternative or augmentative modes of communication for children who are unable to meet their daily communication needs through natural modes such as speech, gestures or handwriting.
Term Offered: Fall

SPED 7250 Assessment and Planning in Transition Education and Services
[3 credit hours]
The course examines the planning and programming that supports young adults with disabilities during their transition from school to adult life. The course will cover several issues in the area of transition, including models of transition, planning, evidence-based instruction, assessment, transition planning, and progress monitoring. Course content will prepare the student to have a leadership role in curriculum development.
Term Offered: Fall

SPED 7260 Family And Professional Relations In Special Education
[3 credit hours]
Effective parent and professional partnerships will be explored. Interpersonal communication skills, legal issues, effective models for home-school communication, and differences in culture, values and family expectations will be discussed.
Term Offered: Spring, Summer, Fall

SPED 7270 Team Models And Community Networking In Early Intervention
[3 credit hours]
This course will focus on the skills, knowledge and ethical practices essential to the provision of effective service coordination and teaming for early intervention and early childhood special education. In addition, students will examine various models of teaming and consultation approaches and address issues related to working with individuals from cultural backgrounds other than their own.
Term Offered: Spring, Summer, Fall

SPED 7280 Management Of The Learning Environment In Early Childhood Special Education
[3 credit hours]
This class will provide an analysis of the various aspects of quality environments, in the home and early childhood centers for young children with special needs. Students will identify characteristics of natural environments and design interventions that promote positive child outcomes. Critically thinking about evidence-based practices found in the special education professional literature will be emphasized.
Term Offered: Spring

SPED 7310 Advanced Instructional Methods For Teaching Students With Mild Educational Needs
[3 credit hours]
Theoretical considerations for designing instruction, lesson plan development using direct, explicit instructional approach, differentiation, co-teaching, and evidence-based practices to meet the needs of students with mild disabilities in school settings will be examined. Research-based approaches to teaching language arts, mathematics, science, and social studies, will be explored.
Term Offered: Spring, Fall

SPED 7320 Practicum II - Mild Needs
[1 credit hour]
Provides opportunities for field experience to use and refine the strategies for persons with mild disabilities.
Corequisites: SPED 5310
Term Offered: Spring, Fall

SPED 7340 Advanced Behavior Management
[3 credit hours]
This course provides training inservice teachers to become managers of intra-communication and interpersonal relationships in diverse special education settings. Nonviolent Crisis Prevention/Intervention (CPI) training required.
Term Offered: Spring

SPED 7610 Seminar I: Orientation to Interprofessional Teaming
[1 credit hour]
Become familiar with requirements for the Certificate in Interprofessional Teaming. Focus on competencies needed to work collaboratively with professionals to meet the needs of individuals with disabilities and their families.
Prerequisites: SPED 7270 with a minimum grade of D-
Term Offered: Summer

SPED 7630 Seminar III: Evidence-Based Practice and Innovation in Teaming
[1 credit hour]
Issues related to principles of ethical practice, professional and advocacy. Ways in which technology can promote effective teaming practices with other professionals as well as with family members.
Prerequisites: SPED 7620 with a minimum grade of D-
Term Offered: Summer

SPED 7980 Special Topics In Special Education
[1-5 credit hours]
An advanced course for graduate students in special education or related fields. Topics are selected based on needs of the population. Student may repeat this course under different section numbers.
Term Offered: Spring, Summer, Fall

SPED 7990 Independent Study In Special Education
[1-5 credit hours]
Individual study provides graduate students with opportunities to work individually on professional problems with special education faculty. Individual meetings with sponsoring faculty are held.
Term Offered: Spring, Summer, Fall

SPED 8070 Curriculum Models And Intervention Strategies In Early Childhood Special Education
[3 credit hours]
Atypical infant, toddler, and early childhood development will be examined. Specialized intervention techniques, their research and practice base and appropriate curriculum models will be explored. Supporting professional development at various organizational levels is addressed.
Term Offered: Fall

SPED 8250 Issues and Research in Transition and Post-Secondary Outcomes for Students with Disabilities
[3 credit hours]
The course explores the history, ethics, legislation, case law, policy, and research that inform educational and programmatic decisions in the transition education field. Emphasis will be placed on developing the knowledge, skills, and disposition of being a leader in the field of transition services.
Term Offered: Spring

SPED 8430 Policy and Leadership in Special Education
[3 credit hours]
This course examines the societal, legislative, and community-level factors that shape the field of special education. Students will analyze policies, laws, and cultural attitudes toward individuals with disabilities and explore their influence on service provision, advocacy, and inclusive practices. By developing leadership strategies, students will learn to navigate and influence systemic change, fostering equity and promoting innovative solutions within the special education landscape.
Term Offered: Fall

SPED 8450 Adaptive Development and Support Systems in Special Education
[3 credit hours]
This course explores adaptive systems that indirectly influence individuals with special needs, focusing on family support networks, school systems, and community resources. Students will learn to design, evaluate, and enhance social, emotional, and behavioral support systems that foster cohesive and comprehensive development. The course emphasizes the use of evidence-based practices to address the needs of individuals with disabilities across diverse settings.
Term Offered: Spring

SPED 8460 Evidence-Based Practices in Special Education
[3 credit hours]
This course examines advanced concepts and frameworks for supporting individuals with disabilities through evidence-based interventions and systemic practices. Designed for future researchers, faculty, and school administrators, the course focuses on critically analyzing research-driven strategies and their impact on educational, behavioral, and social-emotional outcomes. Emphasis is placed on designing and evaluating interventions that address complex needs across diverse educational settings and stakeholder systems. Students will engage in scholarly inquiry, apply theoretical frameworks, and develop innovative projects to advance the field of special education.
Term Offered: Fall

SPED 8490 Collaborative Research in Advanced Special Education
[3 credit hours]
This course provides a collaborative platform for doctoral-level special education students to engage with peers on advanced research topics in special education. Students will present their current research ideas, receive structured peer feedback, and participate in discussions on cutting-edge issues in the field. This seminar fosters academic community, enhances research rigor, and promotes collective problem-solving.
Term Offered: Spring

SPED 8900 Independent Research In Special Education
[1-5 credit hours]
Independent Research provides opportunities to work on individual research under the direction of faculty. The student meets with the instructor at intervals and conducts research without formal class meeting.
Term Offered: Spring, Summer, Fall

SPED 8940 Internship/Externship In Special Education
[1-8 credit hours]
Provides the advanced graduate student with supervised practicum experiences at an off-campus site; including schools, hospitals, agencies, rehabilitation clinics, work training sites and other community sites where persons with disabilities are served.
Term Offered: Spring, Summer, Fall

SPED 8960 Doctoral Dissertation In Curriculum & Instruction
[1-12 credit hours]
The doctoral dissertation is an original scholarly product required of all students completing the doctoral degree in Special Education Services.
Term Offered: Spring, Summer, Fall

SPED 8990 Independent Study In Special Education
[1-5 credit hours]
Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Department of Special Education Services. Individual meetings with sponsoring faculty are held.
Term Offered: Spring, Fall

Education Specialist in Curriculum and Instruction

The Education Specialist in Curriculum and Instruction degree is designed to meet the needs of individuals involved with the curriculum, teaching, and supervision aspects of discipline-centered areas of study. The EdS is a post-master's graduate program that provides students an area of educational specialization with emphasis on practice. The degree culminates in a practicum experience working in a school setting. Education Specialists are prepared to become teacher leaders, curriculum specialists, assessment specialists, or mentor teachers in their districts.

The EdS in Curriculum and Instruction is a 30 semester hour program. Students take courses in their area of concentration at the specialist level (beyond the master's). The degree culminates in a practicum experience working in a school setting. Coursework is completed through a combination of on-campus and online courses.

ADMISSION TO THE EDS IN CURRICULUM AND INSTRUCTION

In addition to admission requirements of the College of Graduate Studies, admission to the education specialist program requires the following:

- A master's degree from an accredited institution
- A well-written statement of purpose describing your background and goals as well as the importance of this degree in achieving those goals and demonstrating your writing ability
- Three letters of recommendation regarding your ability and character to succeed in this degree program from academic professionals

The education specialist program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What To Submit With Your Application

- Official transcripts from all institutions of higher education
- Statement of purpose
- Three letters of recommendation

For the Education Specialist degree, students must complete the following program requirements:

- A minimum of 30 semester hours of approved graduate course work beyond the master's level (7000 or 8000 level)
- A curriculum and instruction core that includes two of CI 7650, 8800, 8810, or 8830 or other approved curriculum and instruction course, with courses pre-approved by the faculty advisor
- An area of specialization in curriculum and instruction
- A supporting area with courses pre-approved by the faculty advisor
- An education specialist practicum experience

In addition, no more than six semester hours of credit from any combination of workshops (7950), problems or special topics courses (7980), and independent studies (7990) may be included in the degree program.

All coursework and requirements of the specialist degree must be taken within a six-year period immediately preceding the date the degree is awarded.

Plan of Study

A plan of study identifying the courses for the specialist degree is required after 12 credit hours, generally at the end of the first semester of full time study. The specialist plan of study must include the following within the 30 semester hour minimum:

- 6 credits of curriculum and instruction core
  - Two of CI 7650, 8800, 8810, or 8830 or other approved curriculum and instruction course
- 15 credits of specialization in curriculum and instruction
- 6 credits of a supporting area
- 3 credits of education specialist practicum

Licensure or endorsement may require additional semester hours to fulfill the credential requirements as well as degree requirements.

Guide for Developing a Plan of Study

Below is a guide for developing a Plan of Study for the Education Specialist in Curriculum and Instruction. Students should work with their faculty advisor to identify specific courses to fulfill program requirements.

Code	Title	Hours
Curriculum and Instruction Core		
Select two of the following:		6
CI 7650		
CI 8800	Foundations Of Curriculum & Instruction	
CI 8810	Curriculum Development: K-12	
CI 8830	Curriculum Trends And Issues	
Other curriculum courses as approved by faculty advisor		
Specialization in Curriculum and Instruction		
Select 15 credits as approved by faculty advisor		15
Supporting Area		
Select 6 credits as approved by advisor		6
Education Specialist Practicum		
Select the following:		3
CI 7940	Specialist Practicum In Curriculum And Instruction	
Total Hours		**30**

- PLO 1: Demonstrate knowledge of core ideas in curriculum and instruction including current ideas and issues in a thoughtful and substantive manner.
- PLO 2: Develop and articulate a theoretically grounded and supported argument regarding the study of teaching in a content area.
- PLO 3: Design a plan for studying learning that integrates core ideas and develops pedagogical content knowledge.
- PLO 4: Participate knowledgeably, reflectively, and professionally in discussions regarding core ideas for the study of teaching.
- PLO 5: Critique and provide productive feedback for peers.
- PLO 6: Communicate professionally in formal writing using language style and conventions of academic English and APA guidelines.
- PLO 7: Present an evidence-based account of students' learning based on assessment findings and evaluations.

Graduate Certificate in Advance Reading and Literacy Instruction

This certificate is designed for licensed teachers who want to be highly qualified to work with struggling readers and writers. The coursework that is part of this certificate also meets guidelines for the coursework

required for Ohio teachers to add the Ohio Reading Endorsement to their teaching licenses.

The certificate is a 12 semester hour program. All coursework is completed online and includes a minimum of 100 hours of field-based experience spanning multiple grade levels.

ADMISSION TO THE CERTIFICATE IN ADVANCE READING AND LITERACY INSTRUCTION

In addition to admission requirements of the college of Graduate Studies, admission to the certificate program requires the following:

- A baccalaureate degree from an accredited college or university
- A current Ohio educator license
- Twelve (12) semester hours of undergraduate or graduate prerequisite coursework in the teaching of reading PRIOR to taking any Advanced Reading/Literacy courses
- A 3 semester hour undergraduate or graduate course in phonics (This requirement is usually met in an undergraduate course prior to enrolling in the certificate program, but it can be met while completing the certificate coursework.)

The certificate program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

WHAT TO SUBMIT WITH YOUR APPLICATION

- Official transcripts from all institutions of higher education
- Copy of current teaching license(s)
- Resume or curriculum vitae

REQUIREMENTS FOR THE CERTIFICATE IN ADVANCED READING AND LITERACY INSTRUCTION

For the Certificate, students must complete the following program requirements:

- A minimum of 12 semester hours of approved graduate course work
- An area of specialization in reading and literacy instruction that includes CI 6400/8400, 6410/8410, 6430/8430, 6440/8440

Courses may be included as part of a master's or doctoral degree program as approved by the student's faculty advisor. Master's level courses (5000/6000 level) may be included as part of a master's plan of study. Doctoral level courses (7000/8000 level) may be included as part of a doctoral plan of study.

All coursework and requirements of the certificate must be taken within a four-year period immediately preceding the date the degree is awarded.

Additional Requirements

Students should consult with their faculty advisor for detailed information.

Prior to Applying to Add Endorsement to the Ohio Educator License

- Acceptable scores on the Ohio Assessment for Educators (http://www.oh.nesinc.com/) (OAE) Content Assessment(s) for the endorsement

Guide for Developing a Plan of Study

Below is a guide for developing a Plan of Study for the Certificate. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

A plan of study identifying the courses for the certificate is required after 6 credit hours. The certificate plan of study must include the following within the 12 semester hour minimum:

- 12 credits of specialization in reading and literacy instruction

GUIDE FOR DEVELOPING A PLAN OF STUDY

Below is a guide for developing a Plan of Study for the Certificate in Advanced Reading and Literacy Instruction. Students should work with their faculty advisor to identify specific courses to fulfill program requirements.

Code	Title	Hours
Specialization in Reading		
CI 6400/8400	Trends In Literacy Acquisition	3
CI 6410/8410	Content Area Literacy	3
CI 6430/8430	Diagnosis Of Reading Disability	3
CI 6440/8440	Remediation Practicum	3

- PLO 1. Describe core components of English literacy acquisition including: phonemic awareness, phonics, oral language development, writing, vocabulary development, fluency and comprehension
- PLO 2. Identify ways in which literacy acquisition is related to aspects of culture
- PLO 3. Describe theories and principles of effective literacy assessment
- PLO 4. Select, administer and interpret literacy assessments for specific purposes
- PLO 5. Use foundational knowledge of core components of English literacy acquisition to design and implement literacy instruction
- PLO 6. Use literacy assessment information to plan and evaluate instruction
- PLO 7. Design, implement and evaluate content area instruction in each of the following areas: vocabulary, comprehension, writing, and critical thinking

Graduate Certificate in Career-based Intervention

This certificate is designed for licensed teachers who want to develop the skills to work with at-risk students and help improve their academic

competence, develop employability skills, implement a career plan, graduate from high school and participate in a career pathway in preparation for postsecondary education and/or careers. Students in this certificate program complete the requirements for the Ohio Endorsement in Career-based Intervention.

The certificate is a 9 semester-hour program. All coursework is completed online and includes a minimum of 50 hours of school-based experience.

Admission to the Certificate in Career-based Intervention

In addition to admission requirements of the college of Graduate Studies, admission to the certificate program requires the following:

- A baccalaureate degree from an accredited college or university
- A current Ohio educator license
- Two years of successful teaching experience
- One year of work experience outside of education

The certificate program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Copy of current teaching license(s)
- Resume or curriculum vitae

Requirements for the Certificate in Career-based Intervention

For the Certificate, students must complete the following program requirements:

- A minimum of 9 semester hours of approved graduate course work

For the Ohio licensure endorsement, students must complete additional requirements to fulfill the credential requirements as well as the certificate requirements.

Courses may be included as part of a master's degree program as approved by the student's faculty advisor. Master's level courses (5000/6000 level) may be included as part of a master's plan of study.

All coursework and requirements of the certificate must be taken within a four-year period immediately preceding the date the degree is awarded.

Certificate Coursework

Code	Title	Hours
Select the following:		
CTE 5020	Occupational Safety And Liability	3
CTE 5140	Cooperative Education	3
CTE 5160	Curriculum Development & Teaching	3

GUIDE FOR DEVELOPING A PLAN OF STUDY

Below is a guide for developing a Plan of Study for the graduate certificate. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		Hours
CTE 5140	Cooperative Education	3
	Hours	**3**
Second Term		
CTE 5160	Curriculum Development & Teaching	3
	Hours	**3**
Third Term		
CTE 5020	Occupational Safety And Liability	3
	Hours	**3**
	Total Hours	**9**

- Standard 1. Candidates know and understand the content and specific concepts related to Career-based Intervention education.
- Standard 2. Candidates create learning environments that promote high levels of learning and achievement for all students.
- Standard 3. Candidates demonstrate the ability to plan and deliver effective instruction that advances the learning of each individual student.
- Standard 4. Candidates understand and use varied assessments to inform instruction, evaluate, and ensure student learning.
- Standard 5. Candidates collaborate and communicate with students, parents, other educators, administrators, and the community to support student learning.
- Standard 6. Candidates assume responsibility for professional growth, performance and involvement as an individual and as a member of a learning community.

Graduate Certificate in Prekindergarten Special Needs

This certificate is designed for licensed teachers who want to develop the skills to work effectively and successfully with preschool-aged children with disabilities in a variety of settings. Students in this certificate program complete the requirements for the Ohio Endorsement in Prekindergarten Special Needs and are qualified to teach in a school district-sponsored preschool special needs classroom or serve as itinerant preschool teachers serving young children with disabilities.

The certificate is a 15 semester-hour program. All coursework is completed online and includes a minimum of 50 hours of field-based experience.

Admission to the Certificate in Prekindergarten Special Needs

In addition to admission requirements of the College of Graduate Studies, admission to the master's program requires the following:

- A baccalaureate degree from an accredited four-year institution
- A current Ohio educator license in K-12 Intervention Specialist (mild/moderate or moderate/intensive) or in Early Childhood Education (PK-3)

The certificate program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Copy of current teaching license(s)
- Resume or curriculum vitae

Requirements for the Certificate in Prekindergarten Special Needs

For the Certificate, students must complete the following program requirements:

- A minimum of 15 semester hours of approved graduate coursework

Courses may be included as part of a master's degree program as approved by the student's faculty advisor.

All coursework and requirements of the certificate must be taken within a four-year period immediately preceding the date the degree is awarded.

Certificate Coursework

Code	Title	Hours
SPED 5010	Atypical Development In Early Childhood: Implications For Development	3
SPED 5270	Team Models And Community Networking In Early Intervention	3
SPED 5280	Management Of The Learning Environment In Early Childhood Special Education	3
SPED 6070	Curriculum Models And Intervention Strategies In Early Childhood Special Education	3
CIEC 6750	Developmental And Classroom Assessment	3

Additional requirements

Prior to Apply for Ohio Teaching Endorsement

- Acceptable scores on the Ohio Assessment for Educators (http://www.oh.nesinc.com/) (OAE) Content Assessment(s) for the endorsement

GUIDE FOR DEVELOPING A PLAN OF STUDY

Below is a guide for developing a Plan of Study for the Certificate. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		Hours
CIEC 6750	Developmental And Classroom Assessment	3
SPED 5010	Atypical Development In Early Childhood: Implications For Development	3
	Hours	**6**
Second Term		
SPED 5270	Team Models And Community Networking In Early Intervention	3
	Hours	**3**
Third Term		
SPED 6070	Curriculum Models And Intervention Strategies In Early Childhood Special Education	3
	Hours	**3**
Fourth Term		
SPED 5280	Management Of The Learning Environment In Early Childhood Special Education	3
	Hours	**3**
	Total Hours	**15**

- 2.6 Candidates design environments to promote active engagement, learning, and participation.
- 3.1 Candidates use developmentally appropriate instructional strategies to meet the individual needs and learning styles of young children.
- 3.2 Candidates utilize a variety of resources to design, implement, and evaluate meaningful curricula that address learning goals.
- 3.3 Candidates know and use multiple and varied strategies to help special needs young children learn content-specific knowledge in the general curriculum.
- 4.1 Candidates use data to individualize and adapt practices to meet each child's changing needs.
- 4.2 Candidates use appropriate formal and informal assessment tools and approaches.
- 4.3 Candidates partner with families and other professionals in the assessment process.
- 4.5 Candidates know and uphold federal and state laws, policies, and procedural requirements.
- 5.1 Candidates interact, communicate and work collaboratively with other professionals to plan instruction and construct appropriate learning goals for the special needs child.
- 5.2 Candidates collaborate with families to help establish connections with community resources.
- 5.3 Candidates support and empower families to participate in the early childhood special education process, including the development and implementation of the Individual Education Program (IEP).
- 6.1 Candidates know professional codes of ethics, and uphold ethical practices in their teaching.
- 6.2 Candidates reflect on their practices, articulate a philosophy and rationale for decisions, and self-assess and evaluate themselves as a basis for professional development.

- 6.3 Candidates seek opportunities to positively impact policies, practices, and procedures that support young children with special needs and their families.
- 6.4 Candidates support the evaluation process to secure and evaluate services by participating as an Evaluation Team member.
- 6.5 Candidates assume a leadership role in connecting children and families to community resources and services.

Graduate Certificate in Transition to Work

This certificate is designed for teachers who are licensed as intervention specialists or vocational educators who want to develop the skills to support youth with disabilities in their transition planning and related services. Students in this certificate program complete the requirements for the Ohio Endorsement in Transition to Work and are qualified to serve in transition-focused roles such as Job Training Coordinator and Career Assessment Specialist (CAS)

The certificate is a 9 semester-hour program. All coursework is completed online and includes a minimum of 50 hours of field-based experience.

Admission to the Certificate in Transition to work

In addition to admission requirements of the college of Graduate Studies, admission to the certificate program requires the following:

- A baccalaureate degree from an accredited college or university
- A current Ohio educator license as intervention specialist in special education or as a vocational educator

The certificate program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to submit with Your Application

- Official transcripts from all institutions of higher education
- Copy of current teaching license(s)
- Resume or curriculum vitae

Requirements for the Certificate in Transition to Work

For the Certificate, students must complete the following program requirements:

- A minimum of 9 semester hours of approved graduate course work

Courses may be included as part of a master's degree program as approved by the student's faculty advisor. Master's level courses (5000/6000 level) may be included as part of a master's plan of study.

All coursework and requirements of the certificate must be taken within a four-year period immediately preceding the date the degree is awarded.

Certificate Coursework

Code	Title	Hours
SPED 5170	Partnerships in Transition Planning	3
SPED 5250	Assessment and Planning in Transition Education and Services	3
SPED 6250	Issues and Research in Transition and Post-Secondary Outcomes for Students with Disabilities	3
Total Hours		**9**

GUIDE FOR DEVELOPING A PLAN OF STUDY

Below is a guide for developing a Plan of Study for the graduate certificate. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		Hours
SPED 5170	Partnerships in Transition Planning	3
SPED 5250	Assessment and Planning in Transition Education and Services	3
	Hours	**6**
Second Term		
SPED 6250	Issues and Research in Transition and Post-Secondary Outcomes for Students with Disabilities	3
	Hours	**3**
	Total Hours	**9**

- Standard 1. Candidates know and understand the foundations of special education and the framework of secondary transition services.
- Standard 2. Candidates create learning environments that promote high levels of learning and achievement for all students.
- Standard 3. Candidates demonstrate the ability to plan and deliver effective instruction that advances the learning of each individual student.
- Standard 4: Candidates construct and use varied assessments to inform instruction, evaluate, and ensure student learning.
- Standard 5. Candidates collaborate and communicate with students, parents, other educators, administrators, and the community to support student learning.
- Standard 6. Candidates assume responsibility for professional growth, performance and involvement as an individual and as a member of a learning community.

Master of Education in Career-Technical Education

The Master of Education in Career Tech Education is designed for individuals who hold a bachelor's degree and wish to earn an initial Ohio teaching license at the graduate level in conjunction with a master's degree. Students in this program earn a master's degree and complete requirements for an initial Ohio educator license for teaching in an approved career-tech workforce development program.

The ME in Career Tech Education is a 33 semester hour program. Students take courses in teacher education that include practicum and internship experiences in PK-12 schools along with supporting education courses. The program culminates with the completion of a master's culminating seminar. Coursework is completed through a combination of on-campus, online, and field-based courses.

Admission to the ME in Career-Tech Education

In addition to admission requirements of the College of Graduate Studies, admission to the master's program requires the following:

- A baccalaureate degree from an accredited four-year institution
- A well-written statement of purpose describing your background and goals as well as the importance of this degree in achieving those goals
- One letter of recommendation regarding your potential for doing master's level work from professionals such as an undergraduate major advisor, current employer, school principal or others who are knowledgeable about your ability to engage in graduate work in this degree program
- Employment to teach in a Career-Technical Education pathway in an Ohio school

The master's program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Statement of purpose
- One letter of recommendation
- Completed Initial CTE-37 Form from the Ohio Department of Education & Workforce with signatures from your school district

Requirements for the ME in Career-Tech Education

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 30 semester credit hours of approved graduate course work
- An area of specialization in teacher education that includes practicum and internship experiences in PK-12 schools
- Supporting coursework with courses pre-approved by the faculty advisor
- A master's culminating experience

For the Ohio licensure, students must complete additional requirements to fulfill the credential requirements as well as the degree requirements

No more than six semester hours of credit from any combination of workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

All coursework and requirements of the master's degree must be taken within a six-year period immediately preceding the date the degree is awarded.

Master's Coursework

Specialization in Teacher Education

Code	Title	Hours
Select the following:		
CTE 5010	Teaching Occupational Skills	3
CTE 5030	Teaching Occupational Knowledge	3
CTE 5050	Methods Of Teaching Career And Technical Education I	3
CTE 5070	Methods Of Teaching Career And Technical Education II	3
CTE 5110	CTE Program Guidance and Trends	3
CTE 5930	Supervised Teaching (Take this 3 credit hour course twice over two semesters)	6
Supporting Coursework		
EDP 5340	Classroom Engagement and Behavioral Supports	3
CI 5490	Content Area Literacy	3
Master's Culminating Experience		
CTE 6900	Research Seminar In Career And Technical Education	3
Total Hours		**30**

Guide for Developing a Plan of Study

Below is a guide for developing a Plan of Study for the Master of Education. Student should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		Hours
CTE 5010	Teaching Occupational Skills	3
CTE 5030	Teaching Occupational Knowledge	3
	Hours	**6**
Second Term		
CTE 5050	Methods Of Teaching Career And Technical Education I	3
CTE 5930	Supervised Teaching	3
	Hours	**6**
Third Term		
CTE 5070	Methods Of Teaching Career And Technical Education II	3
CTE 5930	Supervised Teaching	3
	Hours	**6**

Fourth Term		
EDP 5340	Classroom Engagement and Behavioral Supports	3
	Hours	**3**
Fifth Term		
CTE 5110	CTE Program Guidance and Trends	3
CI 5490	Content Area Literacy	3
	Hours	**6**
Sixth Term		
CTE 6900	Research Seminar In Career And Technical Education	3
	Hours	**3**
	Total Hours	**30**

- PLO 1 CLASSROOM ENVIRONMENT: Create a learning environment that encourages student motivation, positive behavior and collaborative social interaction. 1.1. Create safe and respectful learning environments where teachers and students safely operate equipment and follow emergency protocols (e.g., local and OSHA regulations, equipment operation and proper disposal of hazardous waste.) 1.2. Model respect for students diverse cultures, language skills and experiences. 1.3. Motivate students to work productively and assume responsibility for their learning.
- PLO 2 CURRICULUM: Create short-term and long-term, standards-based, instructional plans based on the varying learning needs of students. 2.1. Collaborate with postsecondary institutions to create in-demand career pathways and inform students of college credit opportunities. 2.2. Inform and encourage students to obtain and maintain industry credentials related to their career pathways. 2.3. Develop curriculum documents (e.g., course syllabus, course of study, unit plans and lesson plans) that meet the needs of all students by utilizing Depth of Knowledge (DOK) Levels. 2.4. Integrate competencies for relevant industry-recognized credentials into lesson plans. 2.5. Develop intellectually challenging projects that require higher-order reasoning and problem-solving skills. 2.6. Utilize career-technical student organizations to reinforce in-class instruction and promote 21st century skills. 2.7. Modify instruction to support all students in achieving their full learning potential. 2.8. Integrate employability skills as well as challenging technical content and knowledge into daily instruction. 2.9. Integrate challenging academic content and knowledge into daily instruction.
- PLO 3 INSTRUCTION: Use instructional strategies that actively engage students in developing problem-solving, critical-thinking and teamwork skills. 3.1. Use content-specific instructional strategies to teach main concepts and skills effectively. 3.2. Create learning situations where students work independently, collaboratively and as a whole class, while providing opportunities for individual assessment. 3.3. Integrate the main components of a career-technical education program into instruction (i.e., laboratory, classroom and career-technical student organizations). 3.4. Identify the domains of learning (i.e., cognitive, affective and psychomotor) and how they relate to the career-technical education classroom and laboratory. 3.5. Demonstrate instructional strategies that foster positive relationships with students.\\n3.6. Utilize business and industry to develop and implement experiential and work-based learning\\nopportunities for students that enhance classroom and laboratory learning. 3.7. Demonstrate how inquiry-based instructional strategies are a prominent part of teaching practices.
- PLO 4 ASSESSMENT: Utilize formal and informal assessment strategies to evaluate students progress toward learning goals, provide feedback to improve student learning and improve instruction. 4.1. Select, develop and use a variety of diagnostic, formative and summative assessments to monitor student learning and progress. 4.2. Provide opportunities for students to self-assess their learning and set individual goals. 4.3. Analyze student data to reflect, self-assess and modify the teaching-learning cycle (e.g., plan, teach, assess, revise and reteach). 4.4. Make assessment results available to students and stakeholders in a format that is understandable and maintains appropriate privacy requirements.
- PLO 5 PROGRAM REVIEW: Utilize data for continual program improvement. 5.1. Use Quality Program Standards and program-level data to review the career-technical education program and recommend improvements. 5.2. Establish, implement and maintain a required advisory committee aligned with the program pathway. 5.3. Utilize the advisory committee s recommendations to assist with program review and improvement.
- PLO 6. RECRUITMENT: Engage all stakeholders in the development and support of the career-technical program. 6.1. Articulate to stakeholders (e.g., parents, students, business leaders and associated school personnel) how career-technical education prepares students for successful employment and ongoing education. 6.2. Actively recruit for and market the career-technical education program to all populations, including non-traditional students (e.g., recruit males for predominantly female occupations and vice versa). 6.3. Collaborate with business and other community organizations to promote positive student learning and work-based learning experiences.
- PLO 7 PROFESSIONALISM: Continue to develop as professionals. 7.1. Adhere to established ethics, policies and legal codes of professional conduct. 7.2. Participate in ongoing education and professional development to stay current and obtain advanced training, industry credentials and licensure requirements. 7.3. Communicate professionally, clearly and effectively. 7.4. Collaborate with district teachers and administrators on non-teaching responsibilities (e.g., serving on committees, attending staff and individualized education program meetings, supervising students during non-teaching times.) 7.5. Participate in related local, state and national professional associations.

Master of Education in Curriculum and Instruction

The Master of Education in Curriculum and Instruction degree is designed for those who wish to become more effective educators. Students in this program develop greater expertise in developing curriculum, designing instruction, assessing, and understanding the needs of learners. Students work with faculty to choose a range of courses focused on their particular interest within curriculum and instruction.

The ME in Curriculum and Instruction is a 30 semester hour program. Students take courses in Curriculum and Instruction along with education courses selected with a faculty adviser based on the student's interests and goals. Students also choose a Supporting Area from one of the

following areas: Early Childhood Education, Educational Psychology, Literacy, Research and Measurement, Special Education, or Theory and Social Foundations. The program culminates with a theory and research course and the completion of a master's culminating seminar, project, or thesis depending on the student's interest.

Admission to the ME in Curriculum and Instruction

In addition to admission requirements of the College of Graduate Studies, admission to the master's program requires the following:

- A baccalaureate degree from an accredited four-year institution
- A well-written statement of purpose describing your background and goals as well as the importance of this degree in achieving those goals
- Three letters of recommendation regarding your potential for doing master's level work from professionals such as an undergraduate major advisor, current employer, school principal or others who are knowledgeable about your ability to engage in graduate work in this degree program

The master's program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your application

- Official transcripts from all institutions of higher education
- Statement of purpose
- Three letters of recommendation

Requirements for the ME in Curriculum and Instruction

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 30 semester credit hours of approved graduate course work
- 15 credit hours of core courses
- 12 credit hours of specialization in one area: Curriculum and Instruction, Early Childhood, or Literacy
- 3 credit hours of culminating experience

Note that courses may only apply to one category (i.e., core or specialization).

All coursework and requirements of the master's degree must be taken within a six-year period immediately preceding the date the degree is awarded.

Guide for Developing a Plan of Study

Below is a guide for developing a Plan of Study for the Master of Education in Curriculum and Instruction. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

Note that courses may only apply to one category (i.e., core, specialization, or supporting area).

Code	Title	Hours
Curriculum and Instruction Core		
CI 6800	Foundations Of Curriculum & Instruction	3
CI 6830	Curriculum Trends And Issues	3
EDP 5110	Advanced Educational Psychology	3
RESM 5310	Understanding and Consuming Research	3
TSOC 5300	Philosophy of Education	3
Students must choose ONE specialization		**12**
Specialization in Curriculum and Instruction		
CI 6400	Trends In Literacy Acquisition	
CI 6650	Teacher Learning and Education	
CI 6810	Curriculum Development: K-12	
CIEC 6310	Pre-K/Primary Curriculum	
Specialization in Early Childhood Education		
CIEC 6310	Pre-K/Primary Curriculum	
CIEC 6320	Meaning And Development Of Play Behavior	
CIEC 6330	Language And Concept Development	
CIEC 6950	Theory And Research In Early Childhood	
Specialization in Literacy		
CI 6400	Trends In Literacy Acquisition	
CI 6410	Content Area Literacy	
CI 6430	Diagnosis Of Reading Disability	
CI 6440	Remediation Practicum	
Master's Culminating Experience		
CI 6920	Masters Research Project In Curriculum And Instruction	3
Total Hours		**30**

- PLO 1. Advanced Curriculum Leadership Improvement \nGraduates will lead collaborative curriculum design and evaluation efforts by critically analyzing instructional programs, applying advanced theories of#learning, and using research to guide school-wide curriculum improvements.
- PLO 2. Critical Pedagogical Analysis Instructional Transformation \nGraduates will conduct systematic, critical analyses of classroom practices—using frameworks from#learning#sciences, equity-oriented pedagogy, and instructional design—to develop and model transformative teaching practices that elevate#learning#for all students.
- PLO 3. Data Leadership Evidence-Informed Decision Making \n \nGraduates will lead teams in collecting, analyzing, and interpreting multiple sources of student and program data to diagnose instructional needs, implement responsive interventions, and promote equitable#learning outcomes#across classrooms and grade levels.

- PLO 4. Professional Leadership, Advocacy, Organizational Change \nGraduates will demonstrate advanced educational leadership by mentoring colleagues, facilitating professional#learning#communities, and advocating for evidence-based policies and practices that promote continuous improvement and organizational change within schools.

Master of Education in Early Childhood Education

The Master of Education in Early Childhood Education degree is designed for those who hold a bachelor's degree and wish to earn an initial Ohio teaching license at the graduate level in conjunction with a master's degree. Students in this program earn a master's degree and complete requirements for an initial Ohio educator license in Primary Education for grades PK through grade 5.

The ME in Early Childhood Education is a 36 semester hour program. Students take courses in teacher education that include practicum and internship experiences in PK-12 schools along with supporting education courses. The program culminates with a theory and research course and the completion of a master's culminating seminar, project, or thesis depending on the student's interest. Coursework is completed through a combination of on-campus, online, and school-based courses.

Admission to the ME in Early Childhood Education

In addition to admission requirements of the College of Graduate Studies, admission to the master's program requires the following:

- A baccalaureate degree from an accredited four-year institution
- A well-written statement of purpose describing your background and goals as well as the importance of this degree in achieving those goals
- One letter of recommendation regarding your potential for doing master's level work from professionals such as an undergraduate major advisor, current employer, school principal or others who are knowledgeable about your ability to engage in graduate work in this degree program
- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work is preferred
- A content area grade point average (GPA) of at least 2.7 on a 4.0 scale for coursework for the selected licensure area is preferred
- Undergraduate content area and literacy-related coursework for the selected licensure area
    - Literacy courses CI 3400, CI 3430, and CI 3460 are required prior to beginning the master's program

The master's program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Statement of purpose
- Resume
- One letter of recommendation

Requirements for the ME in Early Childhood Education

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 36 semester credit hours of approved graduate course work
- An area of specialization in teacher education that includes practicum and internship experiences in PK-12 schools
- Supporting coursework with courses pre-approved by the faculty advisor
- A master's culminating experience

For the Ohio licensure, students must complete additional requirements to fulfill the credential requirements as well as the degree requirements.

No more than six semester hours of credit from any combination of workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

All coursework and requirements of the master's degree must be taken within a six-year period immediately preceding the date the degree is awarded.

Master's Coursework

Code	Title	Hours
Specialization in Teacher Education		
CIEC 5460	Science Methods For Early Childhood Education	3
CIEC 5480	Practicum I	1
CIEC 5550	Teaching Methods For Early Childhood Social Studies	3
CI 6300	Seminar in Student Teaching	1
CIEC 5770	Practicum II	1
CIEC 6750	Developmental And Classroom Assessment	3
CIEC 6940	Internship/Student Teaching In Primary Education	4
CI 5470	Literacy Assessment and Remediation	3
CI 5510	Mathematics For The Young Child	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
SPED 5000	Issues In Special Education	3
Supporting Coursework		
EDP 5340	Classroom Engagement and Behavioral Supports	3
Master's Culminating Experience		
Select ONE of the Following:		3
CIEC 6950	Theory And Research In Early Childhood	

CI 6890	Theory and Research in Learning and Teaching Content	
Select ONE of the Following:		3
CIEC 6900	Masters Research Seminar In Early Childhood Educaton	
CIEC 6920	Masters Research Project In Early Childhood Education	
CI 6900	Master's Culminating Seminar In Teacher Education	
Total Hours		**37**

Additional Requirements

Prior to Beginning Classroom Experiences

- Current Ohio preservice teacher permit or other permit as specified by The State of Ohio are required prior to beginning classroom experiences.
- Acceptable scores on the Ohio Assessment for Educators (http://www.oh.nesinc.com/) (OAE) Content Assessment for the licensure area
- All undergraduate content area and literacy related courses

Prior to Applying for Ohio Teaching License

- Acceptable scores on all Ohio Assessment for Educators (OAE) tests and edTPA Portfolio Assessment as specified tests specified by The State of Ohio for the licensure area are required prior to applying for Ohio teaching license.

GUIDE FOR DEVELOPING A PLAN OF STUDY

Below is a guide for developing a Plan of Study for the Master of Education. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		**Hours**
Select the following:		
EDP 5340	Classroom Engagement and Behavioral Supports	3
CIEC 6750	Developmental And Classroom Assessment	3
CIEC 6950	Theory And Research In Early Childhood	3
	Hours	**9**
Second Term		
Select the following:		
CI 5470	Literacy Assessment and Remediation	3
CIEC 5460	Science Methods For Early Childhood Education	3
CIEC 5480	Practicum I	1
	Hours	**7**
Third Term		
Select the following:		
SPED 5000	Issues In Special Education	3
CIEC 5550	Teaching Methods For Early Childhood Social Studies	3
CIEC 5770	Practicum II	1
CI 5510	Mathematics For The Young Child	3
CI 6900	Master's Culminating Seminar In Teacher Education	1
	Hours	**11**
Fourth Term		
Select the following:		
CI 6300	Seminar in Student Teaching	1
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
CIEC 6940	Internship/Student Teaching In Primary Education	4
CI 6900	Master's Culminating Seminar In Teacher Education	2
	Hours	**10**
	Total Hours	**37**

- PLO 1: Candidates use their understanding of young children's characteristics and needs, and of multiple interacting influences on children s development and learning, to create environments that are healthy, respectful, supportive, and challenging for all children.
- PLO 2: Candidates know about, understand, and value the importance and complex characteristics of children's families and communities. They use this understanding to create respectful, reciprocal relationships that support and empower families, and to involve all families in their children's development and learning.
- PLO 3: Candidates know about and understand the goals, benefits, and uses of assessment. They know about and use systematic observations, documentation, and other effective assessment strategies in a responsible way, in partnership with families and other professionals, to positively influence children's development and learning.
- PLO 4: Candidates integrate their understanding of and relationships with children and families; their understanding of developmentally effective approaches to teaching and learning; and their knowledge of academic disciplines to design, implement, and evaluate experiences that promote positive development and learning for all children.
- PLO 5: Candidates identify and conduct themselves as members of the early childhood profession. They know and use ethical guidelines and other professional standards related to early childhood practice. They are continuous, collaborative learners who demonstrate knowledgeable, reflective, and critical perspectives on their work, making informed decisions that integrate knowledge from a variety of sources.

Master of Education in Middle Childhood Education

The Master of Education in Middle Childhood Education is designed for those who hold a bachelor's degree and wish to earn an initial Ohio

teaching license at the graduate level in conjunction with a master's degree. Students in this program earn a master's degree and complete requirements for an initial Ohio educator license in Middle Childhood for grades 4 through 9 in two subject-matter areas. Subject-matter area options include: reading/language arts, mathematics, science and social studies. Students completing this program will also be eligible for an intervention specialist dual license for grades 4 through 9.

The ME in Middle Childhood Education is a 34 semester hour program. Students take courses in teacher education that include practicum and internship experiences in PK-12 schools along with supporting education courses. The program culminates with the completion of a master's culminating seminar. Coursework is completed through a combination of on-campus, online, and field-based courses.

Admission to the ME in Middle Childhood Education

In addition to admission requirements of the College of Graduate Studies, admission to the master's program requires the following:

- A baccalaureate degree from an accredited four-year institution
- A well-written statement of purpose describing your background and goals as well as the importance of this degree in achieving those goals
- One letter of recommendation regarding your potential for doing master's level work from professionals such as an undergraduate major advisor, current employer, school principal or others who are knowledgeable about your ability to engage in graduate work in this degree program
- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work is preferred
- A content area grade point average (GPA) of at least 2.7 on a 4.0 scale for coursework in the selected licensure area is preferred
- Undergraduate content area and literacy-related coursework for the selected licensure area
    - Literacy courses CI 3400, CI 3430, and CI 3460 are required prior to beginning the master's program

The master's program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Statement of purpose
- Resume
- One letter of recommendation

Requirements for the ME in Middle Childhood Education

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 34 semester credit hours of approved graduate course work
- An area of specialization in teacher education that includes practicum and internship experiences in PK-12 schools
- Supporting coursework with courses
- A master' culminating experience

For the Ohio licensure, students must complete additional requirements to fulfill the credential requirements as well as the degree requirements

In addition, no more than six semester hours of credit from any combination of workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

All coursework and requirements of the master's degree must be taken within a six-year period immediately preceding the date the degree is awarded.

Master's Courework

Code	Title	Hours
Specialization in Teacher Education		
Select the following:		
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
CI 6950	Internship Capstone	1
CI 6300	Seminar in Student Teaching	1
CI 5470	Literacy Assessment and Remediation	3
SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
SPED 6190	Policy, Context, and Hallmarks of Special Education	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
Select TWO of the following:		6
CI 6110	Language Arts Methods of Teaching	
CI 6120	Social Studies Methods of Teaching	
CI 6130	Mathematics Method of Teaching	
CI 6140	Science Methods of Teaching	
Select ONE of the following:		1
CI 6210	Practicum in Teaching Language Arts	
CI 6220	Practicum in Teaching Social Studies	
CI 6230	Practicum in Teaching Mathematics	
CI 6240	Practicum in Teaching Science	
Select ONE of the following:		4

CI 6250	Internship/Student Teaching in Language Arts	
CI 6260	Internship/Student Teaching in Social Studies	
CI 6270	Internship/Student Teaching in Mathematics	
CI 6280	Internship/Student Teaching in Science	
Supporting Coursework		
EDP 5110	Advanced Educational Psychology	3
Master's Culminating Experience		3
CI 6900	Master's Culminating Seminar In Teacher Education (Part One)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Two)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Three)	
Total Hours		**35**

Additional Requirements

Students should consult with their faculty advisor for detailed information.

Prior to Beginning Classroom Experiences

- Current Ohio preservice teacher permit or other permit as specified by The State of Ohio are required prior to beginning classroom experiences.
- Acceptable scores on the Ohio Assessment for Educators (http://www.oh.nesinc.com/) (OAE) Content Assessment(s) for the licensure area
- All undergraduate content area and literacy-related courses

Prior to Applying for Ohio Teaching License

- Acceptable scores on all Ohio Assessment for Educators (OAE) tests and edTPA Portfolio Assessment as specified tests specified by The State of Ohio for the licensure area are required prior to applying for Ohio teaching license.

GUIDE FOR DEVELOPING A PLAN OF STUDY

Below is a guide for developing a Plan of Study for the Master of Education. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		**Hours**
Select the following:		
EDP 5110	Advanced Educational Psychology	3
SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
CI 6900	Master's Culminating Seminar In Teacher Education (Part ONE)	1
Select TWO of the following:		6
CI 6110	Language Arts Methods of Teaching	
CI 6120	Social Studies Methods of Teaching	
CI 6130	Mathematics Method of Teaching	
CI 6140	Science Methods of Teaching	
Select ONE of the following:		1
CI 6210	Practicum in Teaching Language Arts	
CI 6220	Practicum in Teaching Social Studies	
CI 6230	Practicum in Teaching Mathematics	
CI 6240	Practicum in Teaching Science	
	Hours	**15**

Second Term

Select the following:		
CI 5470	Literacy Assessment and Remediation	3
CI 6300	Seminar in Student Teaching	1
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
CI 6900	Master's Culminating Seminar In Teacher Education (Part TWO)	1
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
Select ONE of the following:		4
CI 6250	Internship/Student Teaching in Language Arts	
CI 6260	Internship/Student Teaching in Social Studies	
CI 6270	Internship/Student Teaching in Mathematics	
CI 6280	Internship/Student Teaching in Science	
	Hours	**15**

Third Term

Select the following:		
SPED 6190	Policy, Context, and Hallmarks of Special Education	3
CI 6950	Internship Capstone	1
CI 6900	Master's Culminating Seminar In Teacher Education (Part THREE)	1
	Hours	**5**
	Total Hours	**35**

- PLO 1: Learner Development Learning Differences: Apply knowledge of middle childhood developmental stages to design instruction and learning experiences that bridge elementary and adolescent needs, supporting equitable access to learning.
- PLO 2: Learning Environments: Create safe, supportive, and culturally responsive learning environments that promote collaboration, engagement, and self-motivation among grades 4–9 learners.
- PLO 3: Content Knowledge Application: Demonstrate deep understanding of central concepts, tools of inquiry, and structures of middle-level disciplines, and apply this knowledge to design equitable and meaningful learning experiences.
- PLO 4: Instructional Practice: Plan and implement instruction using multiple strategies and technologies to support rigorous learning goals, address transitional needs between elementary and secondary

education, differentiate instruction, and foster critical thinking and creativity

- PLO 5: Assessment Data-Informed Practice: Use formative and summative assessments to monitor learner progress, guide instructional decisions, and engage learners in age-appropriate self-assessment and goal setting.
- PLO 6: Professional Responsibility Ethics: Engage in ongoing professional learning, reflect on practice, act ethically, and collaborate with families, colleagues, and community partners to support learner growth.
- PLO 7: Research: Meaningfully interpret ideas and research from the professional literature to construct and present an argument in response to a question in subject matter education.

Master of Education in Secondary Education

The Master of Education in Secondary Education degree is designed for those who hold a bachelor's degree and wish to earn an initial Ohio teaching license at the graduate level in conjunction with a master's degree. Students in this program earn a master's degree and complete requirements for an initial Ohio educator license in Adolescent and Young Adult Education for grades 7 through 12 in one subject-matter area or Multi-age Education for PreK through grade 12 in one world language. Subject-matter area options include: English language arts, mathematics, chemistry, Earth and space science, life science, physics, integrated science or social studies. World language options include: Chinese, French, German, or Spanish. Students completing requirements for a license in adolescent and young adult education will also be eligible for an intervention specialist dual license for grades 7 through 12.

The ME in Secondary Education is a 31 semester hour program. Students take courses in teacher education that include practicum and internship experiences in PK-12 schools along with supporting education courses. The program culminates with the completion of a master's culminating seminar. Coursework is completed through a combination of on-campus, online, and field-based courses.

Admission to the ME in Secondary Education

In addition to admission requirements of the College of Graduate Studies, admission to the master's program requires the following:

- A baccalaureate degree from an accredited four-year institution
- A well-written statement of purpose describing your background and goals as well as the importance of this degree in achieving those goals
- One letter of recommendation regarding your potential for doing master's level work from professionals such as an undergraduate major advisor, current employer, school principal or others who are knowledgeable about your ability to engage in graduate work in this degree program
- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work is preferred
- A content area grade point average (GPA) of at least 2.7 on a 4.0 scale for coursework in the selected licensure area is preferred
- Undergraduate content area and literacy-related coursework for the selected licensure area

The master's program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Statement of purpose
- Resume
- One letter of recommendation

- Secondary Education (p. 390)Foreign Language Concentration, ME
- Secondary Education: Language Arts Education Concentration, ME (p. 391)
- Secondary Education: Mathematics Education Concentration, ME (p. 392)
- Secondary Education: Science Education Concentration, ME (p. 392)
- Secondary Education: Social Studies Education Concentration, ME (p. 393)

Secondary Education - Foreign Language Concentration, ME

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 32 semester credit hours of approved graduate course work
- A concentration in foreign language teacher education that includes practicum and internship experiences in PK-12 schools
- A master's culminating experience

For the Ohio licensure, students must complete additional requirements to fulfill the credential requirements as well as the degree requirements

In addition, no more than six semester hours of credit from any combination of workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

Master's Coursework

Code	Title	Hours
Specialization in Teacher Education		
CI 5490	Content Area Literacy	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
CI 6300	Seminar in Student Teaching	1
EDP 5110	Advanced Educational Psychology	3
CI 6950	Internship Capstone	1

SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
SPED 6190	Policy, Context, and Hallmarks of Special Education	3
Concentration in Foreign Language		
SPAN 5120	Teaching Colloquia	3
CI 6310	Practicum in Teaching Foreign Language	1
CI 6320	Internship/Student Teaching in Foreign Language	4
Master's Culminating Experience		3
CI 6900	Master's Culminating Seminar In Teacher Education (Part One)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Two)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Three)	
Total Hours		**32**

Additional Requirements

Students should consult with their faculty advisor for detailed information.

Prior to Beginning Classroom Experiences

- Current Ohio preservice teacher permit or other permit as specified by The State of Ohio are required prior to beginning classroom experiences.
- Acceptable scores on the Ohio Assessment for Educators (OAE) Content Assessment(s) for the licensure area
- All undergraduate content area courses

Prior to Applying for Ohio Teaching License

- Acceptable scores on all Ohio Assessment for Educators (OAE) tests and edTPA Portfolio Assessment as specified tests specified by The State of Ohio for the licensure area are required prior to applying for Ohio teaching license.

Secondary Education: Language Arts Education Concentration, ME

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 32 semester credit hours of approved graduate course work
- A concentration in language arts education that includes practicum and internship experiences in PK-12 schools
- A master's culminating experience

For the Ohio licensure, students must complete additional requirements to fulfill the credential requirements as well as the degree requirements

In addition, no more than six semester hours of credit from any combination of workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

Master's Coursework

Code	Title	Hours
Specialization in Teacher Education		
CI 5490	Content Area Literacy	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
CI 6300	Seminar in Student Teaching	1
CI 6950	Internship Capstone	1
EDP 5110	Advanced Educational Psychology	3
SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
SPED 6190	Policy, Context, and Hallmarks of Special Education	3
Concentration in Language Arts Education		
CI 6110	Language Arts Methods of Teaching	3
CI 6210	Practicum in Teaching Language Arts	1
CI 6250	Internship/Student Teaching in Language Arts	4
Master's Culminating Experience		3
CI 6900	Master's Culminating Seminar In Teacher Education (Part One)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Two)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Three)	
Total Hours		**32**

Additional Requirements

Students should consult with their faculty advisor for detailed information.

Prior to Beginning Classroom Experiences

- Current Ohio preservice teacher permit or other permit as specified by The State of Ohio are required prior to beginning classroom experiences.
- Acceptable scores on the Ohio Assessment for Educators (OAE) Content Assessment(s) for the licensure area
- All undergraduate content area courses

Prior to Applying for Ohio Teaching License

- Acceptable scores on all Ohio Assessment for Educators (OAE) tests and edTPA Portfolio Assessment as specified tests specified by The State of Ohio for the licensure area are required prior to applying for Ohio teaching license.

Secondary Education: Mathematics Education Concentration, ME

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 32 semester credit hours of approved graduate course work
- A concentration in mathematics teacher education that includes practicum and internship experiences in PK-12 schools
- A master's culminating experience

For the Ohio licensure, students must complete additional requirements to fulfill the credential requirements as well as the degree requirements

In addition, no more than six semester hours of credit from any combination of workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

Master's Coursework

Code	Title	Hours
Specialization in Teacher Education		
CI 5490	Content Area Literacy	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
CI 6300	Seminar in Student Teaching	1
EDP 5110	Advanced Educational Psychology	3
CI 6950	Internship Capstone	1
SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
SPED 6190	Policy, Context, and Hallmarks of Special Education	3
Concentration in Mathematics Education		
CI 6130	Mathematics Method of Teaching	3
CI 6230	Practicum in Teaching Mathematics	1
CI 6270	Internship/Student Teaching in Mathematics	4
Master's Culminating Experience		3
CI 6900	Master's Culminating Seminar In Teacher Education (Part One)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Two)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Three)	
Total Hours		**32**

Additional Requirements

Students should consult with their faculty advisor for detailed information.

Prior to Beginning Classroom Experiences

- Current Ohio preservice teacher permit or other permit as specified by The State of Ohio are required prior to beginning classroom experiences.
- Acceptable scores on the Ohio Assessment for Educators (OAE) Content Assessment(s) for the licensure area
- All undergraduate content area courses

Prior to Applying for Ohio Teaching License

- Acceptable scores on all Ohio Assessment for Educators (OAE) tests and edTPA Portfolio Assessment as specified tests specified by The State of Ohio for the licensure area are required prior to applying for Ohio teaching license.

Secondary Education: Science Education Concentration, ME

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 32 semester credit hours of approved graduate course work
- A concentration in science teacher education that includes practicum and internship experiences in PK-12 schools
- Supporting coursework with courses pre-approved by the faculty advisor
- A master's culminating experience

For the Ohio licensure, students must complete additional requirements to fulfill the credential requirements as well as the degree requirements

In addition, no more than six semester hours of credit from any combination of workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

Master's Coursework

Code	Title	Hours
Specialization in Teacher Education		
CI 5490	Content Area Literacy	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
CI 6300	Seminar in Student Teaching	1
EDP 5110	Advanced Educational Psychology	3
CI 6950	Internship Capstone	1
SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
SPED 6190	Policy, Context, and Hallmarks of Special Education	3

Concentration in Science Education		
CI 6140	Science Methods of Teaching	3
CI 6240	Practicum in Teaching Science	1
CI 6280	Internship/Student Teaching in Science	4
Master's Culminating Experience		3
CI 6900	Master's Culminating Seminar In Teacher Education (Part One)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Two)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Three)	
Total Hours		**32**

Additional Requirements

Students should consult with their faculty advisor for detailed information.

Prior to Beginning Classroom Experiences

- Current Ohio preservice teacher permit or other permit as specified by The State of Ohio are required prior to beginning classroom experiences.
- Acceptable scores on the Ohio Assessment for Educators (OAE) Content Assessment(s) for the licensure area
- All undergraduate content area courses

Prior to Applying for Ohio Teaching License

- Acceptable scores on all Ohio Assessment for Educators (OAE) tests and edTPA Portfolio Assessment as specified tests specified by The State of Ohio for the licensure area are required prior to applying for Ohio teaching license.

Secondary Education: Social Studies Education Concentration, ME

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 32 semester credit hours of approved graduate course work
- A concentration in social studies teacher education that includes practicum and internship experiences in PK-12 schools
- Supporting coursework with courses pre-approved by the faculty advisor
- A master's culminating experience

For the Ohio licensure, students must complete additional requirements to fulfill the credential requirements as well as the degree requirements

In addition, no more than six semester hours of credit from any combination of workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

Master's Coursework

Code	Title	Hours
Specialization in Teacher Education		
CI 5490	Content Area Literacy	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
CI 6300	Seminar in Student Teaching	1
EDP 5110	Advanced Educational Psychology	3
CI 6950	Internship Capstone	1
SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
SPED 6190	Policy, Context, and Hallmarks of Special Education	3
Concentration in Social Studies		
CI 6120	Social Studies Methods of Teaching	3
CI 6220	Practicum in Teaching Social Studies	1
CI 6260	Internship/Student Teaching in Social Studies	4
Master's Culminating Experience		3
CI 6900	Master's Culminating Seminar In Teacher Education (Part One)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Two)	
CI 6900	Master's Culminating Seminar In Teacher Education (Part Three)	
Total Hours		**32**

Additional Requirements

Students should consult with their faculty advisor for detailed information.

Prior to Beginning Classroom Experiences

- Current Ohio preservice teacher permit or other permit as specified by The State of Ohio are required prior to beginning classroom experiences.
- Acceptable scores on the Ohio Assessment for Educators (OAE) Content Assessment(s) for the licensure area
- All undergraduate content area courses

Prior to Applying for Ohio Teaching License

- Acceptable scores on all Ohio Assessment for Educators (OAE) tests and edTPA Portfolio Assessment as specified tests specified by The State of Ohio for the licensure area are required prior to applying for Ohio teaching license.

- Secondary Education (p. 390)Foreign Language Concentration, ME
- Secondary Education: Language Arts Education Concentration, ME (p. 391)
- Secondary Education: Mathematics Education Concentration, ME (p. 392)

- Secondary Education: Science Education Concentration, ME (p. 392)
- Secondary Education: Social Studies Education Concentration, ME (p. 395)

Secondary Education Foreign Language Concentration, ME

Below is a guide for developing a Plan of Study for the Master of Education. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		Hours
SPAN 5120	Teaching Colloquia	3
CI 6310	Practicum in Teaching Foreign Language	1
EDP 5110	Advanced Educational Psychology	3
SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
CI 6900	Master's Culminating Seminar In Teacher Education	1
	Hours	**12**
Second Term		
CI 6320	Internship/Student Teaching in Foreign Language	4
CI 6300	Seminar in Student Teaching	1
CI 5490	Content Area Literacy	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
CI 6900	Master's Culminating Seminar In Teacher Education	1
	Hours	**15**
Third Term		
SPED 6190	Policy, Context, and Hallmarks of Special Education	3
CI 6950	Internship Capstone	1
CI 6900	Master's Culminating Seminar In Teacher Education (Part THREE)	1
	Hours	**5**
	Total Hours	**32**

Secondary Education: Language Arts Education Concentration, ME

Below is a guide for developing a Plan of Study for the Master of Education. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		Hours
EDP 5110	Advanced Educational Psychology	3
SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
CI 6110	Language Arts Methods of Teaching	3
CI 6210	Practicum in Teaching Language Arts	1
CI 6900	Master's Culminating Seminar In Teacher Education (Part ONE)	1
	Hours	**12**
Second Term		
CI 5490	Content Area Literacy	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
CI 6250	Internship/Student Teaching in Language Arts	4
CI 6300	Seminar in Student Teaching	1
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
CI 6900	Master's Culminating Seminar In Teacher Education (Part TWO)	1
	Hours	**15**
Third Term		
Select the following:		
SPED 6190	Policy, Context, and Hallmarks of Special Education	3
CI 6950	Internship Capstone	1
CI 6900	Master's Culminating Seminar In Teacher Education (Part THREE)	1
	Hours	**5**
	Total Hours	**32**

Secondary Education: Mathematics Education Concentration, ME

Below is a guide for developing a Plan of Study for the Master of Education. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		Hours
CI 6130	Mathematics Method of Teaching	3
CI 6230	Practicum in Teaching Mathematics	1
EDP 5110	Advanced Educational Psychology	3
SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
CI 6900	Master's Culminating Seminar In Teacher Education (Part ONE)	1
	Hours	**12**

Second Term		
CI 6270	Internship/Student Teaching in Mathematics	4
CI 6300	Seminar in Student Teaching	1
CI 5490	Content Area Literacy	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
CI 6900	Master's Culminating Seminar In Teacher Education (Part TWO)	1
	Hours	**15**
Third Term		
SPED 6190	Policy, Context, and Hallmarks of Special Education	3
CI 6950	Internship Capstone	1
CI 6900	Master's Culminating Seminar In Teacher Education (Part THREE)	1
	Hours	**5**
	Total Hours	**32**

Secondary Education: Science Education Concentration, ME

Below is a guide for developing a Plan of Study for the Master of Education. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		**Hours**
CI 6140	Science Methods of Teaching	3
CI 6240	Practicum in Teaching Science	1
EDP 5110	Advanced Educational Psychology	3
SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
CI 6900	Master's Culminating Seminar In Teacher Education (Part ONE)	1
	Hours	**12**
Second Term		
CI 6280	Internship/Student Teaching in Science	4
CI 6300	Seminar in Student Teaching	1
CI 5490	Content Area Literacy	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
CI 6900	Master's Culminating Seminar In Teacher Education (Part TWO)	1
	Hours	**15**
Third Term		
SPED 6190	Policy, Context, and Hallmarks of Special Education	3
CI 6950	Internship Capstone	1
CI 6900	Master's Culminating Seminar In Teacher Education (Part THREE)	1
	Hours	**5**
	Total Hours	**32**

Secondary Education: Social Studies Education Concentration, ME

Below is a guide for developing a Plan of Study for the Master of Education. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		**Hours**
CI 6120	Social Studies Methods of Teaching	3
CI 6220	Practicum in Teaching Social Studies	1
EDP 5110	Advanced Educational Psychology	3
SPED 6110	Practices of Teaching Learners with Exceptionalities	3
SPED 6210	Practicum in Teaching Learners with Exceptionalities	1
CI 6900	Master's Culminating Seminar In Teacher Education (Part ONE)	1
	Hours	**12**
Second Term		
CI 6260	Internship/Student Teaching in Social Studies	4
CI 6300	Seminar in Student Teaching	1
CI 5490	Content Area Literacy	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
SPED 6130	Advanced Practices for Inclusive and Specialized Teaching	3
CI 6900	Master's Culminating Seminar In Teacher Education (Part TWO)	1
	Hours	**15**
Third Term		
SPED 6190	Policy, Context, and Hallmarks of Special Education	3
CI 6950	Internship Capstone	1
CI 6900	Master's Culminating Seminar In Teacher Education (Part THREE)	1
	Hours	**5**
	Total Hours	**32**

- PLO 1: Learner Development Learning Differences: Apply knowledge of adolescent cognitive, linguistic, social, emotional, and physical development to design age-appropriate instruction and learning experiences that support equitable access to learning.
- PLO 2: Learning Environments: Create safe, supportive, and culturally responsive learning environments that promote collaboration, engagement, and self-motivation among grades 7–12 learners.

- PLO 3: Content Knowledge Application: Demonstrate deep understanding of central concepts, tools of inquiry, and structures of secondary-level disciplines, and apply this knowledge to design equitable and meaningful learning experiences.
- PLO 4: Instructional Practice: Plan and implement instruction using multiple strategies and technologies to support rigorous learning goals, prepare learners for college and career readiness, differentiate instruction, and foster critical thinking and creativity.
- PLO 5: Assessment Data-Informed Practice: Use formative and summative assessments to monitor learner progress, guide instructional decisions, and engage learners in goal setting for postsecondary success.

Master of Education in Special Education

The Master of Education in Special Education degree is designed for those who hold a bachelor's degree and wish to earn an initial Ohio teaching license at the graduate level in conjunction with a master's degree. Students in this program earn a master's degree and complete requirements for an initial Ohio educator license in Intervention Specialist for grades for K through grade 12 in mild/moderate or moderate/intensive needs.

The ME in Special Education is a 36 semester hour program. Students take courses in teacher education that include practicum and internship experiences in PK-12 schools along with supporting education courses. The program culminates with the completion of a master's culminating seminar. Coursework is completed through a combination of on-campus, online, and field-based courses.

Admission to the ME in Special Education

In addition to admission requirements of the College of Graduate Studies, admission to the master's program requires the following:

- A baccalaureate degree from an accredited four-year institution
- A well-written statement of purpose describing your background and goals as well as the importance of this degree in achieving those goals
- One letter of recommendation regarding your potential for doing master's level work from professionals such as an undergraduate major advisor, current employer, school principal or others who are knowledgeable about your ability to engage in graduate work in this degree program
- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work is preferred
- A content area grade point average (GPA) of at least 2.7 on a 4.0 scale for coursework for the selected licensure area is preferred
- Undergraduate content area and literacy-related coursework for the selected licensure area
  - Literacy courses CI 3400, CI 3430, and CI 3460 are required prior to beginning the master's program

The master's program has selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- Statement of purpose
- Resume
- One letter of recommendation

Requirements for the ME in Special Education

For the Master of Education degree, students must complete the following program requirements:

- A minimum of 36 semester credit hours of approved graduate course work
- An area of specialization in teacher education that includes practicum and internship experiences in PK-12 schools
- Supporting coursework with courses pre-approved by the faculty advisor
- A master's culminating experience

For the Ohio licensure, students must complete additional requirements to fulfill the credential requirements as well as the degree requirements.

No more than six semester hours of credit from any combination of workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

All coursework and requirements of the master's degree must be taken within a six-year period immediately preceding the date the degree is awarded.

Master's Coursework

Code	Title	Hours
Specialization in Teacher Education		
SPED 5000	Issues In Special Education	3
SPED 5150	Advanced Practicum For Teaching Students With Moderate Educational Needs	1
SPED 5160	Advanced Instructional Methods For Teaching Students With Moderate Educational Needs	3
SPED 5260	Family And Professional Relations In Special Education	3
SPED 5340	Effective Management of Students with Special Needs in Educational Settings	3
SPED 5380	Transition Process from High School to Post-Secondary Settings for Students w Disabilities	3
SPED 6330	Internship/Student Teaching for Intervention Specialist	4
CI 5470	Literacy Assessment and Remediation	3
CI 6190	Ambitious Teaching in PK-12 Classrooms	3

CI 6300	Seminar in Student Teaching	1
Select ONE of the following sets:		4, 7
Mild/Moderate		
SPED 5310	Advanced Instructional Methods For Teaching Students With Mild Educational Needs	
SPED 5320	Practicum II - Mild Needs	
Moderate/Intensive		
SPED 5180	Advanced Instructional Methods For Teaching Students With Intensive Educational Needs	
SPED 5190	Practicum II - Intensive Needs	
SPED 5210	Augmentative and Alternative Communication	
Supporting Coursework		
EDP 5340	Classroom Engagement and Behavioral Supports	3
Master's Culminating Experience		
Select the following:		3
CI 6900	Master's Culminating Seminar In Teacher Education	
Total Hours		**37-40**

Additional Requirements

Students should consult with their faculty advisor for detailed information.

Prior to Beginning Classroom Experiences

- Current Ohio preservice teacher permit or other permit as specified by The State of Ohio are required prior to beginning classroom experiences.
- All undergraduate content area and literacy-related courses

Prior to Applying for Ohio Teaching License

- Acceptable scores on all Ohio Assessment for Educators (OAE) tests and edTPA Portfolio Assessment as specified tests specified by The State of Ohio for the licensure area are required prior to applying for Ohio teaching license.

GUIDE FOR DEVELOPING A PLAN OF STUDY

Below is a guide for developing a Plan of Study for the Master of Education. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

First Term		**Hours**
Select the following:		
EDP 5340	Classroom Engagement and Behavioral Supports	3
SPED 5150	Advanced Practicum For Teaching Students With Moderate Educational Needs	1
SPED 5160	Advanced Instructional Methods For Teaching Students With Moderate Educational Needs	3
SPED 5260	Family And Professional Relations In Special Education	3
	Hours	**10**

Second Term		
Select the following:		
SPED 5340	Effective Management of Students with Special Needs in Educational Settings	3
CI 5470	Literacy Assessment and Remediation	3
Select ONE of the following sets:		4
Mild/Moderate		
SPED 5310	Advanced Instructional Methods For Teaching Students With Mild Educational Needs	
SPED 5320	Practicum II - Mild Needs	
Moderate/Intensive		
SPED 5180	Advanced Instructional Methods For Teaching Students With Intensive Educational Needs	
SPED 5190	Practicum II - Intensive Needs	
	Hours	**10**

Third Term		
Select the following:		
SPED 5000	Issues In Special Education	3
SPED 5380	Transition Process from High School to Post-Secondary Settings for Students w Disabilities	3
CI 6900 Master's Culminating Seminar in Teacher Education		1
Moderate/Intensive Only		
SPED 5210	Augmentative and Alternative Communication	0,3
	Hours	**7-10**

Fourth Term		
Select the following:		
SPED 6330	Internship/Student Teaching for Intervention Specialist	4
CI 6300	Seminar in Student Teaching	1
CI 6190	Ambitious Teaching in PK-12 Classrooms	3
CI 6900	Master's Culminating Seminar In Teacher Education	2
	Hours	**10**
	Total Hours	**37-40**

- PLO 1: Learner Development Learning: Differences Apply knowledge of exceptionalities and diverse developmental needs to design individualized and inclusive instruction that supports equitable access to learning.
- PLO 2: Learning Environments: Create safe, supportive, and culturally responsive learning environments that promote collaboration, engagement, and self-motivation among learners with disabilities across P–12 settings.
- PLO 3: Content Knowledge Application: Demonstrate deep understanding of central concepts, tools of inquiry, and structures of

special education and general curriculum, and apply this knowledge to design equitable and meaningful learning experiences.

- PLO 4: Instructional Practice: Plan and implement instruction using multiple strategies and technologies to support rigorous learning goals, adapt curriculum for diverse needs, differentiate instruction, and foster critical thinking and creativity.
- PLO 5: Assessment Data-Informed Practice: Use formative and summative assessments to monitor learner progress, guide instructional decisions, and engage learners in individualized goal setting and progress monitoring.
- PLO 6: Professional Responsibility Ethics: Engage in ongoing professional learning, reflect on practice, act ethically, and collaborate with families, colleagues, and related service providers to support learner growth.
- PLO 7: Research: Meaningfully interpret ideas and research from the professional literature to construct and present an argument in response to a question in subject matter education.

PhD in Curriculum and Instruction

Students in the PhD in Curriculum and Instruction study the interactions between learners, teachers, and subject matter. Designed for students interested in research about and leadership in teaching and learning environments, this program develops educators as researchers and advanced professionals in education.

The PhD in Curriculum and Instruction is a 60 semester hour program. Students take core educational courses along with courses selected with faculty based on the student's interests and goals. The program culminates with the completion of original research addressing a problem in curriculum and instruction based on the student's area of concentration. Coursework can be completed on campus or through a combination of on-campus and online courses.

There are two areas of concentration.

Curriculum and Instruction: For students interested in focused study of teaching and learning environments in a particular area such as English language arts, reading, mathematics, science, or social studies or in broader issues of curriculum and instruction.

Special Education: For students interested in focused study of the nature and needs of learners with special needs including early intervention, preschool special needs, high incidence conditions (e.g. learning disability, intellectual disability, emotional disturbance), severe disabilities (e.g. physical, cognitive and social-emotional), transition, and behavior disorders. This concentration is completed online.

Admission to the PhD in Curriculum and Instruction

In addition to admission requirements of the College of Graduate Studies, admission to the doctoral program requires the following:

- A master's degree from an accredited college or university
- Previous academic work necessary to successfully complete a doctoral program in the area of study
- Evidence of research and writing ability such as a master's thesis, proctored writing sample, a written research report, one or more reprints of publications, a paper presented to a professional society, or similar evidence of competence
- A statement of purpose that describes why you wish to pursue this doctoral program and includes information on previous study, educational experience, professional accomplishments, immediate and future professional goals, a proposed time schedule for completing the degree, and any other information that you believe is relevant for admission into this doctoral degree program
- Three letters of recommendation regarding your potential for doing doctoral level work. Letters should be recommendations from professionals who are knowledgeable about your ability to engage in graduate work in this doctoral degree program

What to Submit with Your Application

- Official transcripts from all institutions of higher education
- A sample of academic writing (e.g. report, thesis, project, or academic paper)
- Statement of purpose
- Three letters of recommendation

Degree Requirements By Concentration

- Curriculum and Instruction (p. 398)
- Special Education (p. 399)

Curriculum and Instruction

For the Doctor of Philosophy in Curriculum and Instruction degree, students must complete the following program requirements:

- A minimum of 60 semester credit hours of approved doctoral level (7000/8000 level) course work
- 21 credit hours of specialization in curriculum and instruction
- 15 credit hours of research tools including courses in quantitative research, qualitative research, and independent research
- 9 credit hours in a supporting area
- A written comprehensive program examination
- An oral comprehensive program examination after passing the written examination
- 15 credit hours of dissertation research
- An oral presentation and defense of a dissertation research proposal
- An oral presentation and defense of the completed dissertation research in a public forum
- A written document of the completed dissertation research in approved style and format

All coursework and requirements of the doctoral degree must be taken within a seven-year period immediately preceding the date the degree is awarded.

ADDITIONAL PROGRAM REQUIREMENTS

COURSEWORK PHASE

- A doctoral program committee is required before the completion of 18 credit hours. The doctoral program committee has a minimum of three members who are selected from the membership of the graduate faculty of the University. The doctoral program committee is responsible for assisting the student in the development of a plan of study and assuring competence by overseeing the comprehensive program written examination and the comprehensive program oral examination.

Program Examinations

- A written comprehensive program examination
- An oral comprehensive program examination after successful completion of the written examination

DISSERTATION RESEARCH PHASE

- A doctoral dissertation committee is required immediately after the completion of the required coursework, comprehensive program written examination, and comprehensive program oral examination. The dissertation committee has a minimum of four graduate faculty members including one who is not in the discipline major. The dissertation committee is responsible for guiding dissertation research and approving the dissertation concept, research proposal, and the completed dissertation research, both the written dissertation and oral dissertation defense. Students must work closely with the committee throughout the dissertation process.
- All research with human subjects must be approved by the Institutional Research Board before beginning any phase of the research study. Student must complete IRB training as defined by the University's Human Research Protection Program.
- A public defense of the dissertation is required.
- The final written dissertation must be approved by the dissertation committee and formatted according the guidelines of the college and the College of Graduate Study. Electronic submission of the dissertation to *OhioLINK* is mandatory.

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Special Education

For the Doctor of Philosophy in Curriculum and Instruction degree, students must complete the following program requirements:

- A minimum of 60 semester credit hours of approved doctoral level (7000/8000 level) course work
- 21 credit hours of specialization in special education
- 15 credit hours in research tools including quantitative research, qualitative research, and independent research
- 9 credit hours of supporting courses from other doctoral areas in the College
- A written comprehensive program examination
- An oral comprehensive program examination after passing the written examination
- 15 credit hours of dissertation research
- An oral presentation and defense of a dissertation research proposal
- An oral presentation and defense of the completed dissertation research in a public forum
- A written document of the completed dissertation research in approved style and format

All coursework and requirements of the doctoral degree must be taken within a seven-year period immediately preceding the date the degree is awarded.

ADDITIONAL pROGRAM REQUIREMENTS

COURSEWORK PHASE

- A doctoral program committee is required before the completion of 18 credit hours. The doctoral program committee has a minimum of three members who are selected from the membership of the graduate faculty of the University. The doctoral program committee is responsible for assisting the student in the development of a plan of study and assuring competence by overseeing the comprehensive program written examination and the comprehensive program oral examination.

Program Examinations

- A written comprehensive program examination
- An oral comprehensive program examination after successful completion of the written examination

DISSERTATION RESEARCH PHASE

- A doctoral dissertation committee is required immediately after the completion of the required coursework, the comprehensive program written examination, and the comprehensive program oral examination. The dissertation committee has a minimum of four graduate faculty members including one who is not in the discipline major. The dissertation committee is responsible for guiding dissertation research and approving the dissertation concept, research proposal, and the completed dissertation research, both the written dissertation and oral dissertation defense. Students must work closely with the committee throughout the dissertation process.
- All research with human subjects must be approved by the Institutional Research Board before beginning any phase of the research study. Student must complete IRB training as defined by the University's Human Research Protection Program.
- A public defense of the dissertation is required.
- The final written dissertation must be approved by the dissertation committee and formatted according the guidelines of the college

and the College of Graduate Study. Electronic submission of the dissertation to *OhioLINK* is mandatory.

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Plan of study By Concentration

- Curriculum and Instruction (p. 398)
- Special Education (p. 399)

Curriculum and Instruction

Below is a guide for developing a Plan of Study for the PhD in Curriculum and Instruction. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

Code	Title	Hours
Specialization in Curriculum and Instruction		
EDU 7000	Introduction to Doctoral Studies	3
CIEC 8320	Meaning And Development Of Play Behavior	3
CIEC 8330	Language And Concept Development	3
CI 8650	Teacher Learning and Education	3
CI 8830	Curriculum Trends And Issues	3
EDP 7110	Advanced Educational Psychology	3
TSOC 8310	Major Educational Theorists	3
Research Tools		
EDU 7100	Quantitative Research Foundations: Concepts and Practice	3
EDU 7200	Foundations of Qualitative Research	3
EDU 7300	Foundations of Theory	3
CI 8930	Independent Research In Curriculum And Instruction	3
Select one of the following:		3
EDU 8100	Literacy in Advanced Quantitative Methods	
EDU 8400	Advanced Seminar in Research	
Supporting Area		**9**
Select 9 credits from one area below		
Special Education Supporting Area		
SPED 7250	Assessment and Planning in Transition Education and Services	
SPED 8430	Policy and Leadership in Special Education	
CI 8370	Fundamentals Of Grant Writing	
Early Childhood Supporting Areas		
CIEC 8310	Pre-K/Primary Curriculum	
CIEC 8950	Theory And Research In Early Childhood	
SPED 7270	Team Models And Community Networking In Early Intervention	
SPED 7280	Management Of The Learning Environment In Early Childhood Special Education	
SPED 8070	Curriculum Models And Intervention Strategies In Early Childhood Special Education	
Educational Psychology Supporting Area		
EDP 8160	Self and Identity	
EDP 8120	School Violence Theory, Prevention, and Intervention	
EDP 8270	Parenting: Theory And Research	
Theory and Social Foundations Supporting Area		
TSOC 7110	Modern Educational Controversies	
TSOC 7600	Foundations of Peace Education	
TSOC 8140	School-State Relations	
TSOC 7210	Social Justice in American Society	
Literacy Supporting Area		
CI 8400	Trends In Literacy Acquisition	
CI 8410	Content Area Literacy	
CI 8430	Diagnosis Of Reading Disability	
Program Examinations		
Approval of Written Exam(s)		
Approval of Oral Exam(s)		
Dissertation Research		**15**
CI 8960	Dissertation In Curriculum And Instruction	
Approval of Research Proposal		
Approval of Oral Presentation of Dissertation Research		
Approval of Dissertation Final Document		
Total Hours		**60**

Special Education

Guide for Developing a Plan of Study

Below is a guide for developing a Plan of Study for the PhD in Curriculum and Instruction. Students should review their degree audit and work with their faculty advisor to identify specific courses to fulfill program requirements.

Code	Title	Hours
Specialization in Special Education		
EDU 7000	Introduction to Doctoral Studies	3
SPED 8430	Policy and Leadership in Special Education	3
SPED 8450	Adaptive Development and Support Systems in Special Education	3
SPED 8460	Evidence-Based Practices in Special Education	3
SPED 8490	Collaborative Research in Advanced Special Education	3
CI 8370	Fundamentals Of Grant Writing	3
RESM 8360	Program Evaluation	3
Research Tools		
EDU 7100	Quantitative Research Foundations: Concepts and Practice	3
EDU 7200	Foundations of Qualitative Research	3
EDU 7300	Foundations of Theory	3
SPED 8900	Independent Research In Special Education	3
Select one of the following:		3
EDU 8100	Literacy in Advanced Quantitative Methods	
EDU 8400	Advanced Seminar in Research	
Supporting Area		**9**

Select 9 credits from other doctoral areas in the College following advisor guidance		
Program Examinations		
Approval of Written Exam(s)		
Approval of Oral Exam(s)		
Dissertation Research		**15**
SPED 8960	Doctoral Dissertation In Curriculum & Instruction	
Approval of Research Proposal		
Approval of Oral Presentation of Dissertation Research		
Approval of Dissertation Final Document		
Total Hours		**60**

- PLO 1: Students will be able to critically analyze research and theory in the field of curriculum studies.
- PLO 2: Students will be able to conduct qualitative and/or quantitative research to address critical research questions.
- PLO 3: Students will develop a conceptual and theoretical base in their area of specialization (special education, early childhood education, etc.)
- PLO 4: Students will develop skills necessary to construct and disseminate knowledge in their field.
- PLO 5: Students will conduct original research that addresses current challenges and advances knowledge within their area of specialization.

Department of Women's and Gender Studies

Shara Crookston, Chair

WGST 5860 Seminar in Feminist Theory
[3 credit hours]
This introduction to global feminist thought familiarizes students with feminist terminology and a variety of feminist theoretical frameworks.
Term Offered: Spring

WGST 5880 Queer and Sexuality Theories-WAC
[3 credit hours]
An overview of the complexities, contradictions, and conflicts in the rapidly shifting field sometimes known as Queer Studies. This course attempts to walk a line between the hyberabstraction of "clasic theoretical" concepts/texts and their more "concrete" contextualized locations in communities and identities. This course focuses on the field that emerged from the g/l/b/t movement as it moved into the academy in the l990's.
Term Offered: Spring

WGST 5900 Seminar in Women's Studies
[3 credit hours]
Seminar focused on timely topics in Women's Studies chosen by rotating faculty.
Term Offered: Spring

WGST 5980 Special Topics Gender
[3 credit hours]
A course on specialized topics in Women's and Gender Studies. Consult schedule of courses for topics to be studied and semester offered.
Term Offered: Spring, Summer, Fall

WGST 6240 Research and Methods in Women's and Gender Studies
[3 credit hours]
This course will present an overview of the ways in which women's/gender/feminist studies have informed and complicated traditional theories of research and methodologies. Students will examine and use various research methods and tools to prepare a final research project.
Term Offered: Fall

WGST 6250 Feminism and U.S. Film
[3 credit hours]
This course will focus on the representation of women in dominant U.S. cinema with a particular interest in the filmic responses created by independent women film makers. We will examine the celluloid construction of women and gender presented in classic Hollywood Cinema using the tools of feminist analysis and discourse. We will be particularly concerned with the ways in which gender, race, class and sexuality shape the cinematic representations of women.
Term Offered: Fall

WGST 6260 Women, Gender & Disability
[3 credit hours]
This course will be an interdisciplinary exploration of the intersections of gender and disability and the significance of these categories of analysis as they are understood and experienced by American women with and without disabilities.
Term Offered: Spring

WGST 6980 Directed Readings in Women's and Gender Studies
[1-4 credit hours]
Supervised independent reading and research on selected topics. Student meets individually with instructor to develop a detailed written proposal. The course provides students with the opportunity to read independently on a topic related to gender studies under the direction of a WGST faculty member.
Term Offered: Spring, Summer, Fall

WGST 6990 Independent Project in WGST
[1-4 credit hours]
Supervised independent project. Students work with a faculty member to design a semester long project that utilizes the knowledge and skills gained through the certificate program. The course provides students with the opportunity to develop an individual project related to gender studies under the close supervision of a WGST faculty member.
Term Offered: Spring, Fall

WGST 8000 Independent Study in Women's and Gender Studies
[1-3 credit hours]
Directed study of a specific topic under the supervision of a Women's and Gender Studies faculty member. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Summer, Fall

Department of World Languages and Cultures

An Chung Cheng, Program Director

An Chung Cheng, Spanish Graduate Advisor
Friederike Emonds, German Graduate Advisor

Degrees Offered

- Graduate Certificate in Spanish Translation and Interpretation

FLAN 5160 Teaching Colloquia
[3 credit hours]
A course in the theory of second language acquisition and practice of teaching foreign / second languages in general.
Term Offered: Spring, Summer, Fall

FLAN 5980 Special Topics
[3 credit hours]
Study of a selected topic in foreign languages. Taught in English. May be repeated when topic varies. 3 Credit hours/contact hours
Term Offered: Spring, Fall

FLAN 5990 Independent Study in World Languages and Cultures
[3 credit hours]
Independent study of a selected topic in foreign languages, developed in consultation with a faculty member. May be repeated when the topic varies. 3 hours.
Term Offered: Spring, Summer, Fall

FREN 5010 Advanced French Grammar I
[3 credit hours]
Advanced study of structural and stylistic principles of French with emphasis on longer writing activities and various styles.
Term Offered: Spring

FREN 5020 Advanced French Grammar II
[3 credit hours]
Advanced study of structural and stylistic principles of French with emphasis on longer writing assignments.
Term Offered: Spring

FREN 5070 French Translation
[3 credit hours]
Practice in translation of texts from French into English and English into French. Subject matter area will include commerce, natural, physical, and social sciences and the humanities.

FREN 5160 Teaching Colloquia
[3 credit hours]
A course in the theory of second language acquisition and practice of teaching foreign / second languages in general.
Term Offered: Spring, Summer, Fall

FREN 5200 Contemporary French And Francophone Civilization
[3 credit hours]
A study of contemporary France and/or Francophone cultures including discussion of economics, daily life, the family, social groups, industry, politics and education.
Term Offered: Spring, Fall

FREN 5210 French For Reading Knowledge I
[3 credit hours]
Course designed to develop sufficient reading proficiency to conduct and process research in French. (Not for majors)
Term Offered: Spring, Fall

FREN 5310 Medieval Studies
[3 credit hours]
Introduction to Old French and readings in the major genres from the twelfth through fifteenth centuries.
Term Offered: Fall

FREN 5410 Renaissance Studies
[3 credit hours]
Literature reflecting major currents of the Renaissance.
Term Offered: Spring, Fall

FREN 5510 17th Century French Literature
[3 credit hours]
A study of the development of French Classicism.
Term Offered: Spring, Fall

FREN 5610 18th Century French Literature
[3 credit hours]
Readings from the novels, plays and prose of the major writers of the Enlightenment.
Term Offered: Fall

FREN 5710 19th Century French Literature I
[3 credit hours]
Literary and intellectual trends from Romanticism to Symbolism.

FREN 5810 Contemporary French & Francophone Literature I
[3 credit hours]
Literature of all genres from the period before World War I to the present.
Term Offered: Spring, Fall

FREN 5860 La Production Feminine
[3 credit hours]
This course deals with examples of feminine production which have influenced French culture in the areas of film, literary criticism, literature, philosophy, psychoanalysis and semiotics.
Term Offered: Fall

FREN 5980 Special Topics In French Studies
[3 credit hours]
Study of a selected topic in French or Francophone language, literature, or culture. May be repeated when topic varies.
Term Offered: Spring

FREN 5990 Independent Study In French
[1-3 credit hours]
Independent research in special topics. May be repeated once for additional credit.

FREN 6900 Research In French
[1-3 credit hours]
Independent research of a selected topic in French or Francophone language, literature, or culture. May be repeated once for additional credit.
Term Offered: Spring, Summer, Fall

GERM 5010 German Syntax And Stylistics I
[3 credit hours]
A review of German stylistic structures through the analysis of texts and written and oral exercises.
Term Offered: Fall

GERM 5020 German Syntax And Stylistics II
[4 credit hours]
Further review of German stylistic structures through the analysis of texts and written and oral exercises.
Prerequisites: GERM 5010 with a minimum grade of D-
Term Offered: Spring

GERM 5160 Teaching Colloquia
[3 credit hours]
A course in the theory of second language acquisition and practice of teaching foreign / second languages in general.
Term Offered: Spring, Summer, Fall

GERM 5190 Study Abroad
[1-12 credit hours]
Graduate credit may be granted for foreign study on the basis of credentials that certify the nature of the student's academic achievements in a German-speaking country.
Term Offered: Summer

GERM 5200 German Culture And Civilization
[3 credit hours]
Study of major trends and current developments in German Landeskunde. May be repeated when topic varies.
Term Offered: Spring, Fall

GERM 5210 German For Reading Knowledge I
[3 credit hours]
Elements of pronunciation, structure and vocabulary most appropriate to preparing graduate students to read effectively in German. (Not for major credit).
Term Offered: Spring

GERM 5620 German Classicism
[3 credit hours]
Study of Classical writers of Germany: Goethe, Schiller and their contemporaries.
Term Offered: Spring, Fall

GERM 5710 German Literature Of The 19th Century
[3 credit hours]
Study of selected works by authors from B¿chner to Fontane.
Term Offered: Spring

GERM 5720 German Romanticism
[3 credit hours]
Study of Romantic writers of Germany such as Novalis, Eichendorff, E.T.A. Hoffmann and Bettina Brentano.

GERM 5810 German Literature Of The 20th Century
[3 credit hours]
Study of selected works by authors from the turn of the century to the present.
Term Offered: Spring, Fall

GERM 5850 Genre Studies
[3 credit hours]
Study of a selected literary or film genre, its development, and its influence on German culture. May be repeated for credit when topic varies.
Term Offered: Spring, Fall

GERM 5980 Special Topics In German Studies
[1-3 credit hours]
Study of a selected topic in German language, literature, or culture. May be repeated for credit when topic varies.
Term Offered: Spring, Summer, Fall

GERM 5990 Independent Study In German
[1-3 credit hours]
Independent research in special topics. May be repeated once for additional credit.
Term Offered: Spring, Summer, Fall

GERM 6900 Research In German
[1-3 credit hours]
Independent research of a selected topic in German language, literature, or culture. May be repeated once for additional credit.
Term Offered: Spring, Summer, Fall

GERM 6930 Seminar: Selected Topics
[1-3 credit hours]
Study of selected topics in German language, literature, or culture. May be repeated once for additional credit.
Term Offered: Spring, Summer

SPAN 5000 Advanced Spanish Grammar
[3 credit hours]
An advanced study of Spanish grammar in preparation for higher levels of study in the language and for its use in professional pursuits.
Term Offered: Spring, Fall

SPAN 5010 Syntax And Stylistics
[4 credit hours]
A thorough study of the grammatical structure of Spanish with special attention to stylistic problems.
Term Offered: Spring, Fall

SPAN 5060 Translation & Interpretation In Spanish
[3 credit hours]
A study of the techniques of translation and interpretation as they relate to English and Spanish based on a contrastive analysis of two languages, both in theory and practice.
Term Offered: Spring

SPAN 5070 History Of The Spanish Language
[3 credit hours]
A study of the development of the Spanish language from Vulgar Latin to the present, illustrated with selected texts.
Term Offered: Spring

SPAN 5110 Introduction To Spanish Linguistics
[4 credit hours]
Basic concepts of linguistics as applied to the study of the Spanish language and its dialectal systems. Emphasis phonetics, phonology, morphology, syntax and semantics.
Term Offered: Spring, Fall

SPAN 5120 Teaching Colloquia
[3 credit hours]
A course in the theory of second language acquisition and practice of teaching foreign / second languages in general.
Term Offered: Spring, Summer, Fall

SPAN 5180 Business Spanish
[3 credit hours]
A graduate level introduction to the language of the Hispanic world peculiar to the areas of business and commerce.
Term Offered: Fall

SPAN 5210 Spanish For Reading Knowledge I
[3 credit hours]
Study of those elements of structure and vocabulary most appropriate for preparing graduate students to read effectively in Spanish. (Not for majors)
Term Offered: Spring, Fall

SPAN 5250 Latin American Short Story
[3 credit hours]
Development of the Latin American short story from its origins with special emphasis on the contemporary authors such as Allende, Borges, Cortazar, Garcia Marquez and Rulfo among others.
Term Offered: Fall

SPAN 5820 Modern Spanish Drama
[3 credit hours]
Critical readings of Spanish drama from Romanticism to the latest contemporary trends.

SPAN 5830 Hispanic Cinema
[3 credit hours]
Critical viewings of Spanish-language films from Spain and the Americas. Emphasis on cultural criticism.
Term Offered: Spring, Fall

SPAN 5980 Special Topics
[3 credit hours]
Study and research in specific areas or authors with considerable reading of Spanish texts plus written reports in Spanish.
Term Offered: Spring, Fall

SPAN 6900 Research In Spanish
[1-3 credit hours]
May be repeated for additional credit when topic varies.
Term Offered: Spring, Summer, Fall

SPAN 6930 Seminar: Selected Topics
[1-3 credit hours]
Selected topics from Spanish culture, linguistics, or literature.
Term Offered: Spring, Fall

Graduate Certificate in Spanish Translation and Interpretation

Code	Title	Hours
SPAN 5010	Syntax And Stylistics	4
SPAN 5060	Translation & Interpretation In Spanish	3
SPAN 5180	Business Spanish	3
Total Hours		**10**

- The overall intended learning outcomes are to develop translator competence from English to Spanish. This includes linguistic, methodological, and technical competence as applied to a variety of texts including literature, advertisement, business, healthcare, athletics, legal, computing and educational documents.

Spatially Integrated Social Science (SISS)

Bhuiyan Alam, Director

This program is designed around the application of geographic information science, spatial statistics, spatial econometrics and spatial analysis to study the spatial dimension of human and social dynamics, including interaction of individuals and society, government, and market participants.

Degrees Offered

- Ph.D. in Spatially Integrated Social Science (p. 405)

SISS 7010 Spatial Statistics
[3 credit hours]
The course deals with statistical theory and applied statistical techniques for spatial data analysis. Topics include descriptive statistics, statistical modeling and hypothesis testing for spatial dependence and spatial heterogeneity.
Term Offered: Spring, Fall

SISS 7020 GEOGRAPHICAL INFORMATION SCIENCE IN SISS
[3 credit hours]
The course emphasizes the fundamental elements of cartography, geodesy, statistics, mathematics and geo-computational methods that form the foundation for the development of GIS and spatial analysis tools.
Term Offered: Fall

SISS 8010 FOUNDATIONS OF SPATIALLY INTEGRATED SOCIAL SCIENCE
[3 credit hours]
This course will examine the historical development of the social sciences, their philosophical and methodological approaches to research, and the emergence of the spatial perspective in social science research.
Term Offered: Fall

SISS 8020 SISS THEORY
[3 credit hours]
Advanced study of SISS requiring preparedness in theoretical and methodological aspects of spatial analysis in social sciences focusing on the spatial organization of society and spatial human and social dynamics.
Prerequisites: SISS 8010 with a minimum grade of D-
Term Offered: Spring

SISS 8030 ADVANCED SPATIAL DATA ANALYSIS
[3 credit hours]
Examination of spatial processes: spatial autoregressive models, gaussian Markov random ¿eld models, auto-logistic models, spatial discrete choice models. The topics include spatial panel data models, their applications and estimation methods.
Prerequisites: SISS 7010 with a minimum grade of D-
Term Offered: Spring

SISS 8040 Research Design
[3 credit hours]
Introduces students to research and research technicalities, including what is research, how to write research papers and research proposals, and how to design and manage a research project.
Prerequisites: SISS 8010 with a minimum grade of B- and SISS 8020 with a minimum grade of B-
Term Offered: Spring

SISS 8150 ADVANCED QUALITATIVE ANALYSIS IN SISS
[3 credit hours]
Advanced qualitative analysis techniques and applications to a broad range of spatially oriented social science problems.
Prerequisites: SISS 7010 with a minimum grade of D- and SISS 7020 with a minimum grade of D- and SISS 8010 with a minimum grade of D-

SISS 8170 SPACE AND SOCIETY CRITICAL THEORY IN SISS
[3 credit hours]
Critical examination of both the role of spatial inquiry and its limitations to the understanding of society and space.
Prerequisites: SISS 7010 with a minimum grade of D- and SISS 7020 with a minimum grade of D- and SISS 8010 with a minimum grade of D-
Term Offered: Spring

SISS 8200 SPATIAL PERSPECTIVES ON THE ENVIRONMENT
[3 credit hours]
Examination of the relationship between SISS approaches and human interaction with the natural environment.
Prerequisites: SISS 7010 with a minimum grade of D- and SISS 7020 with a minimum grade of D- and SISS 8010 with a minimum grade of D-
Term Offered: Spring, Fall

SISS 8920 Directed Readings in SISS
[3 credit hours]
Independent study of research literature in Spatially Integrated Social Science and related fields.
Prerequisites: SISS 7010 with a minimum grade of D- and SISS 7020 with a minimum grade of D- and SISS 8010 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

SISS 8940 Seminar in Special Topics
[3 credit hours]
Discussion of the major advances in Spatially Integrated Social Science as presented in the primary research in a selected topic or set of topics.
Prerequisites: SISS 7010 with a minimum grade of D- and SISS 7020 with a minimum grade of D- and SISS 8010 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

SISS 8960 Doctoral Dissertation Research
[1-12 credit hours]
Original research on a comprehensive topic of a spatial nature in the social sciences under the direction of a SISS faculty member. 18 credits in SISS core with grades of B or higher; 9 credits in advanced SISS seminars and 9 credits in SISS electives, all with grades of B or higher. Must pass dissertation qualifying exam within first semester of dissertation.
Term Offered: Spring, Summer, Fall

SISS 8980 Internship in SISS
[1-3 credit hours]
Professional internship opportunity for students in the SISS PhD program that will provide career related experiences intended to enhance student learning as related to knowledge and skills obtained connected to the program requirements and learning outcomes.
Term Offered: Spring, Summer, Fall

Ph.D. in Spatially Integrated Social Science

The Spatially Integrated Social Science (SISS) Ph.D. Program is a multidisciplinary degree program offered jointly by a consortium of academic departments in the Judith Herb College of Arts, Social Sciences and Education that include Geography and Planning, Economics, Political Science and Public Administration, and Sociology and Anthropology. This program is designed around the application of geographic information science, spatial statistics, spatial econometrics and spatial analysis to study the spatial dimension of human and social dynamics, including interaction of individuals and society, government, and market participants.

Students entering this program must have completed a master's degree, preferably in a Social Science discipline. In addition, all students admitted into the program must have completed two courses covering geographic information systems and one course in multivariate statistics. New graduate students who are deficient in these requirements must complete prerequisites prior to entering the program. All students seeking admission are required to provide transcripts, GRE scores, three academic letters of recommendation, and a statement of purpose. All students applying from universities outside of the U.S. are also required to submit TOEFL scores. Completion of the Ph.D. takes up to four years of study beyond the master's degree. The doctoral degree requires 60 semester hours beyond the Master's Degree with 36 course credits and 24 dissertation credits.

Course Work

The doctoral degree requires 72 semester hours beyond the Master's Degree with 30 course credits and 42 dissertation credits.

Code	Title	Hours
Mandatory Core Courses		
SISS 7010	Spatial Statistics	3
SISS 7020	GEOGRAPHICAL INFORMATION SCIENCE IN SISS	3
SISS 8010	FOUNDATIONS OF SPATIALLY INTEGRATED SOCIAL SCIENCE	3
SISS 8020	SISS THEORY	3
SISS 8030	ADVANCED SPATIAL DATA ANALYSIS	3
SISS 8040	Research Design	3
Elective Courses		
Select two courses within an allied social science department [1]		6
Additional Courses		
Select two courses from advanced seminar courses or electives		6
Dissertation		

SISS 8960	Doctoral Dissertation Research	42
Total Hours		**72**

[1] Selected within one of the allied social science departments participating in the program: Geography and Planning, Economics, Political Science and Public Administration, or Sociology and Anthropology.

All courses must be approved by the program director or dissertation advisor. Enrollment for dissertation credit is reserved for the third and fourth years of the program after course work has been completed and the qualifying exam has been passed.

Comprehensive Examination

A comprehensive examination will be scheduled for the summer following the end of the first year of the graduate program and will cover material presented in the first five core courses of the program. To qualify, a student must have a "B" or better in all five core courses. Upon successful completion of the examination, the student can begin taking the advanced seminars and electives in the second year of residence.

Dissertation

In the Spring Semester of the second year of residence, students can begin to establish a Dissertation Advisory Committee. Students will also enroll in the final core course (SISS 8040 (https://catalog.utoledo.edu/search/?P=SISS%208040): Research Design). It is during this time that the student should begin to focus on establishing a dissertation topic. A Qualifying Exam will be administered at the end of the Fall Semester of the student's third year. The Qualifying Exam will test each student on the basis of their knowledge and skills in the area(s) of their dissertation topic. As part of the Qualifying exam, students shall also prepare and present a draft dissertation proposal to their Dissertation Advisory Committee. Upon successful completion of the Qualifying Exam, each student will work on their dissertation for the remainder of Year 3 and up to Year 4.

- PLO 1: Students will be able to identify the major epistemologies across the social sciences, explain the foundations of each epistemology and discuss the application of each in Spatially Integrated Social Sciences.
- PLO 2: Students will be able to construct arguments highlighting the ability of Spatially Integrated Social Science to contribute to knowledge in the social sciences through its emphasis on space and spatial analysis as an integrating theme in the social sciences.
- PLO 3: Students will identify leading spatial theorists, discuss key ideas in their work, and evaluate the significance of their contributions to Spatially Integrated Social Science.
- PLO 4: Students will understand and appropriately apply a broad range of basic spatial statistics to the analysis of discrete and continuous spatial data.
- PLO 5: Students will understand and manage the special issues posed by spatial data including spatial autocorrelation, the modifiable areal unit problem, and issues posed by spatial aggregation.
- PLO 6: Students will master the use of advanced multivariate spatial statistics in a GIS environment and apply them to the analysis of spatial data.
- PLO 7: Students will demonstrate an ability to use GIS software at an advanced level.
- PLO 8: Students will be able to articulate their understanding of the use of a range of remotely sensed imagery, and how that imagery might be analyzed within a GIS environment.
- PLO 9: Students will identify a set of fundamental concepts (scale, aggregation, orientation, etc.) of spatial analysis, how each of these concepts can be managed with a GIS, and evaluate the ways that these basic concepts may fundamentally alter outcomes of social science research.
- PLO 10: Students will be able to evaluate social science theories as they relate to space and spatial behavior, critique the theories, and identify and defend the strongest spatial social science theories.
- PLO 11: Students will demonstrate an ability to synthesize and evaluate research in a chosen area of study within the social sciences, identify pertinent research questions, develop hypotheses, and apply appropriate GI Science, remote sensing, spatial statistics and/or spatial autoregressive analysis to evaluate those hypotheses.

The College of Graduate Studies

Graduate Catalog 2026-2027

The University of Toledo offers a wide array of master's and doctoral programs as well as graduate certificate programs. This catalog provides you with the important information regarding graduate education at UToledo including admissions information, academic regulations, and related policies. For more detailed information about specific policies or academic programs please consult the graduate advisor in your chosen discipline or the College of Graduate Studies.

Mission Statement

The mission of the College of Graduate Studies is to provide leadership for graduate education through exceptional support services for graduate students and faculty; to foster quality in graduate education, research and scholarship; to nurture the diversity and collegiality of graduate programs; and to work with Graduate Council to establish university graduate policies, standards and procedures that define best practices for the graduate programs it serves.

Vision Statement

The vision of the College of Graduate Studies is to enable its graduate and professional academic programs to become nationally distinguished and highly ranked and to improve the human condition by preparing graduates for careers in the 21st century and fostering a culture of life-long learning.

Contact Information

University Hall 3240
Phone: 419.530.GRAD (4723)
Email: Gradstudies@Utoledo.Edu (gradstudies@utoledo.edu)

Mailing address:
The University of Toledo
College of Graduate Studies
University Hall 3240
2801 W Bancroft MS 933
Toledo, OH 43606

College Procedures and Policies

This section is for informational purposes only. While every effort is made to provide accurate and current information, The University of Toledo reserves the right to modify rules, policies, requirements, and any other matter, without notice. It is the responsibility of the student to meet all University, college, and program requirements. The Graduate Catalog clarifies minimum university-level requirements and policies that apply to all graduate students at UToledo. Students are also expected to adhere to requirements and procedures specific to their own degree program and college.

COMMUNICATION

The College of Graduate Studies communicates with students via email. All emails will go to the student's UTAD (Rocky.Rocket@rockets.utoledo.edu) account. Students are advised to check their university email often as this is the official communication channel for all UToledo offices and departments. When communicating with our office, we recommend providing your Rocket number for increased accuracy and efficiency.

College of Graduate Studies Service Emails and Purpose

- Graduate Admissions Services (OnlineGraduateApplication@utoledo.edu (onlinegraduateapplication@utoledo.edu)): All questions related to Graduate Admissions, including application, the application process, application deferrals, and post-admission requirements like official transcripts. Related web page: Graduate Application Process (https://www.utoledo.edu/graduate/admission/how-to-apply/).
- Graduate Academic Services (GCAcademicSvcs@utoledo.edu (gcacademicsvcs@utoledo.edu)): All questions related to academic program forms, degree audits, degree clearance, and related processes including time extensions, service fees, and transfer credits. Related web page: Academic Program Forms (https://www.utoledo.edu/graduate/currentstudents/academicprogramforms/)
- Graduate Student Success (GradSuccess@utoledo.edu (https://catalog.utoledo.eduMailto:gradsuccess@utoledo.edu)): All questions related to student resources, including orientation, programming and professional development, trainings and signature events, commencement, campus services and supports, Invonet, and the Graduate Student Association (GSA). Newsletters, bulletins, and social media originate from this office. Related web page: Graduate Student Success (https://www.utoledo.edu/graduate/success-center/)
- Graduate Administration (GradStudies@utoledo.edu (gradstudies@utoledo.edu)): All questions related to the administration of graduate affairs, including scholarships, grievances, graduate faculty, Grad Council, curriculum, and other questions raised by faculty or staff. Related web page: Faculty and Staff Resources. (https://www.utoledo.edu/graduate/facultystaff/)
- Graduate Assistantships (gradassist@utoledo.edu): Graduate Assistantships are now part of the Academic Administration office under the Office of the Provost and are not part of the College of Graduate Studies. Related web page: Academic Administration and Student Employment (https://www.utoledo.edu/offices/provost/academic-administration/).

College of Graduate Studies Website, Graduate Tab in MyUT Portal, and Social Media

- College of Graduate Studies Home (https://www.utoledo.edu/graduate/): Use links on home page or in the right-hand menu to navigate to admissions, current students, about, and more.
- GRADUATE SUCCESS: The Resources You Need to Succeed (https://www.utoledo.edu/graduate/success-center/): Orientation, Tuition & Funding, Programming, Campus Resources, Academic Forms, Thesis & Dissertation, Graduation & Commencement, Graduate Student Association and more!
- MyUT Portal GRADUATE and STUDENT tabs: (https://myut.utoledo.edu/portal/) The MyUT portal is a secure web environment (you sign in with your UTAD) that provides a single access point for important information. In addition to the STUDENT tab, where you can use your *Student Profile Dashboard* to access class

schedules, grades, transcripts, register for classes, etc., you also have access to the GRADUATE tab, which provides links to everything from important dates to new student information to professional development programming.
- Program and event calendar can be found on the College of Graduate Studies page on Invonet (https://invonet.utoledo.edu/organization/graduate/) (The University of Toledo Involvement Network)
- You can follow us on Facebook (https://www.facebook.com/utoledograd/), Instagram (https://www.instagram.com/utoledograd/) and LinkedIn (https://www.linkedin.com/company/utoledograd/) (utoledograd).

GRADUATE STUDENT ASSOCIATION (GSA)

The GSA is the largest graduate student organization at UToledo. They also function as the student government body of the graduate & professional student population. The GSA meets monthly to discuss topics relevant and important to graduate student life. As a graduate or professional student, you are automatically a member! Active participation in the GSA means eligibility for perks like research travel and conference registration reimbursement and graduate research awards, as well as the ability to run for elected positions! GSA webpage (https://www.utoledo.edu/graduate/success-center/GSA.html).

UNIVERSITY POLICIES

- University Policy Website (https://www.utoledo.edu/policies/) (use the side menu to locate current policies by content area, audience, or search by keyword)
- Graduate Academic Policies (https://www.utoledo.edu/policies/academic/graduate/) (academic dishonesty, academic grievance, leave of absence, missed class, enrollment status)
- Research (https://www.utoledo.edu/policies/academic/research/) (patents, copyright, responsible conduct of scholarship and research, material transfer, conflict of interest, research council)
- General and Undergraduate Academic (https://www.utoledo.edu/policies/academic/undergraduate/) (policies apply to all students, undergraduate and graduate, or undergraduate only as noted)
- Title IX, Student Code of Conduct and Non-Discrimination Policies (https://www.utoledo.edu/title-ix/policies.html)

Graduate Admission

ADMISSION APPLICATION FORM

To apply to a graduate program, applicants should access the Graduate Application page (https://utoledo.edu/graduate/apply/) on the University of Toledo website. Applications are submitted electronically using either the UToledo Graduate Application or a Centralized Application System (CAS) application. The application, along with official transcripts and other required documents (statement of purpose, letters of recommendation, etc.) must be submitted within the ascribed timeline. A non-refundable application fee of $45 for domestic applicants and $75 for international applicants is required for the application to be considered complete. All prospective students must go through the formal College of Graduate Studies application process to be given consideration for admission.

ADMISSION REQUIREMENTS

An applicant is considered for admission to the College of Graduate Studies on the basis of the performance of the applicant in their undergraduate program, and for most programs, a well-formulated objective for graduate study and recommendations from college faculty members acquainted with the student's ability. In some instances, additional recommendations are required. Please review the Graduate Admission Requirements page (https://www.utoledo.edu/graduate/admission/requirements/english-test-exempt.html) and verify additional admission requirements and application deadlines of your program of interest by accessing the Graduate Academic Catalog (https://catalog.utoledo.edu/graduate/). The specific minimum requirements are:

- **Earned Degree:** All graduate applicants must possess (or have earned the equivalent of) at least a bachelor's degree from a regionally accredited college or university. Applicants seeking admission to the Education Specialist must also possess a master's degree from a regionally accredited college or university. Applicants seeking admission to a doctoral degree must possess a master's degree from a regionally accredited college or university unless otherwise indicated by department/program.
- **Cumulative GPA:** A 2.70 cumulative GPA for all previous academic work. All applicants with less than a 2.70 cumulative GPA on all undergraduate work may be required to submit additional program specific admission materials.
- **GRE requirement:** Generally, the GRE is no longer a requirement for most programs. International applicants who do not have a degree earned from a U.S. regionally accredited institution may be required to submit GRE scores for all graduate programs.
- **MCAT requirement:** MCAT scores may be required for some programs in the College of Medicine and Life Sciences (see programs for requirements)
- **Letters of Recommendation:** Depending on the program, letters of recommendation are required. Refer to the specific program's admission criteria for the required number of letters of recommendation.
- **Transcript requirement:** See below for details.
- **English Language Proficiency requirement:** See below for details.

TRANSCRIPT REQUIREMENTS

The College of Graduate Studies requires **official transcripts** from all universities/colleges you are currently attending or have attended. Current and previous UToledo students do not need to submit their UToledo transcripts but must report UToledo on their academic history in the application.

Contact all previous higher education institutions you attended and have them send your official transcripts to the University of Toledo following the guidelines below. We cannot process your application until we receive all your transcripts.

DOMESTIC APPLICANTS

- A transcript is only considered official if it is sent electronically from the issuing institution directly to the University of Toledo, or (if hard copy) it is in the original sealed envelope with a registrar's stamp intact.

- Transcripts should indicate degree earned, date of conferral, and a key to the grading system used.
- Electronic transcripts are preferred. When ordering electronic copies from your previous institution, please choose University of Toledo or University of Toledo Graduate Admissions.
- Hard copy official transcripts should be sent to:

The University of Toledo
College of Graduate Studies
2801 W. Bancroft, MS 933
Toledo, OH 43606

INTERNATIONAL APPLICANTS

- Transcripts should indicate degree earned, date of conferral, and a key to the grading system used.
- Transcripts and diplomas should be submitted in their original language.
- **Evaluations of foreign educational credentials are required** for applicants to programs in the John B. and Lillian E. Neff College of Business, College of Medicine and Life Sciences, Judith Herb College of Arts, Social Sciences, and Education or to the Master of Public Health (MPH) or Master of Science in Occupational Health (MSOH). Evaluations are strongly recommended for applicants to all other programs.
- All credential evaluations must be from one of our four approved partners: Educational Credential Evaluators (ECE), International Education Evaluations (IEE), SpanTran, or World Education Services (WES).
  - Ordering Evaluations Using WES: Please visit WES and order the Course-by-Course International Credential Advantage Package (ICAP).
  - Ordering Evaluations Using SpanTran: SpanTran offers a 20% discount and 5 business day standard turnaround exclusively for UToledo applicants. To receive the discounted rate, please visit the SpanTran website for additional details.
  - Ordering Evaluations Using IEE: IEE has 3-day guaranteed standard processing time and offers a reduced fee of $145 exclusively for UToledo applicants. To receive the discounted rate, please visit the IEE website and order the Education Course Report.
  - Ordering Evaluations Using ECE: Please visit the ECE website and select the Course by Course Report. Review the ECE official documentation requirements carefully, as they vary by country.

When ordering your evaluation you must designate The University of Toledo Graduate Admissions as the recipient of all credential evaluations. The electronic evaluation report will be delivered directly to UToledo.

Please note: If you have only one copy of a foreign transcript or diploma and would like to keep the original, please visit the Graduate Admissions Office with your documents upon arrival to campus and we will process them.

Students who fail to provide official transcripts within the first semester of enrollment will not be permitted to register in subsequent semesters.

TEST SCORES

The University of Toledo Institution code is 1845. Submit your scores through the testing service company. We do not accept paper copies or uploaded digital copies. Test scores must still be valid (not expired) on the first day the student begins their program.

INTERNATIONAL APPLICANTS PROOF OF ENGLISH LANGUAGE PROFICIENCY

Applicants whose native language is not English and who received their undergraduate degrees from non-English speaking institutions must demonstrate a minimum level of English proficiency to be considered for admission into a University of Toledo Graduate Program.

The University of Toledo reserves the right to require additional evidence of English language proficiency for all applicants, the adequacy of which shall be at the sole discretion of the Graduate Admissions Office.

DEMONSTRATE PROOF OF ENLISH LANGUAGE PROFICIENCY

Applicants must demonstrate proof of their English proficiency by meeting at least one of the following conditions:

ENGLISH PROFICIENCY EXAM

An official English language proficiency test report with at least the minimum scores listed below:

- TOEFL iBT (0-120 scale) 80
- TOEFL iBT26 (1-6 scale) 4.0 overall, and 4.0 on all subscores
- IELTS Academic 6.5
- PTE Academic 58
- Duolingo English Test 110
- Cambridge English Score 176

REQUIRED DOCUMENTATION

All scores must be submitted through the testing service company directly to the University of Toledo Graduate Admissions Office. Paper copies or uploaded digital copies are not acceptable. Test scores must still be valid (not expired) on the first day the student begins their program.

EDUCATIONAL BACKGROUND

By the time of enrollment in the desired graduate program, applicant must have successfully completed a bachelor's, master's or doctoral degree with at least a 2.7 cumulative GPA on a 4.0 scale from one of the following types of institutions:

- A regionally accredited US college or university.
- A CHEA-member (https://www.chea.org/) accredited non-US university where English is the official language of instruction.
- A university in one of the listed countries (https://www.utoledo.edu/graduate/admission/english-proficiency/english-test-exempt.html), where English is the official language of instruction at that institution.

- OR -

Successful completion of at least 24 undergraduate credit hours (or 18 graduate credit hours) with at least a 2.7 cumulative GPA on a 4.0 scale at a regionally accredited US college or university.

REQUIRED DOCUMENTATION

The English proficiency requirement will be updated on your application checklist upon receipt and review of all applicable transcripts.

- If your institution is not in the US, please also provide documentation regarding the primary language of instruction.
- For CHEA-member institutions, provide documentation confirming your institution's membership.

Please note:

Graduate degrees that are strictly research-based with no academic coursework are unacceptable for proof of English language proficiency.

GRADUATE ACCESS PROGRAM PATHWAY

Successful completion of the Graduate Access Program (GAP) (https://www.utoledo.edu/cisp/gap.html) pathway through the University of Toledo's American Language Institute (ALI).

REQUIRED DOCUMENTATION

You must provide a copy of your GAP acceptance letter to proceed with the review process. Upon completion of the ALI program you must upload a copy of your ALI Completion Certificate.

APPLICATION UNDER REVIEW

Once your application is complete it will be reviewed by the appropriate Graduate Admissions staff and Academic Program faculty. You may check the progress of your application by logging into your Application Status Page.

When an admission decision is made, you will receive an email notification to log into your Application Status Page to view the decision letter.

Decisions for most programs are made on a rolling basis. Some programs have a limited number of seats available and may make admission decisions on a specific date. Check with your program for details.

Return Intent to Enroll Form

Your admission letter will include a link to an Intent to Enroll form. Please complete and submit the form to accept or decline your offer of admission.

INTERNATIONAL APPLICANTS FINANCIAL RESPONSIBILITY

All international students who will be applying for an F-1 Visa must demonstrate they have adequate financial resources for their graduate education. The financial documentation will need to be submitted with the I-20 request.

I-20 REQUEST INSTRUCTIONS

These instructions are for admitted students who have confirmed their intent to enroll and intend to enter the US on an F-1 Visa. Once you have officially requested your I-20 the International Office will process the request in order of receipt. If any additional items are needed, they will contact you directly via email.

Please note: If you are part of one of the Global Partnership programs (PSG, VIT) you will receive different instructions from your program contact.

Recommended Deadlines for Timely I-20 Processing

The following dates are a guide and do not guarantee receipt of a visa in time for your semester.

Submit:	Fall Start	Spring Start
	Summer Start	
Application and supporting documents	June 30	October 31
	March 31	
I-20 request and supporting documents	July 15	November 15
	April 15	

The I-20 request instructions vary depending whether you need an initial I-20, a deferred I-20 for a future term, or to transfer in from another US institution.

1. Activate your MyUT account
   Go to the UTAD Account Management page and follow the steps for New Account Creation/Activation.
   If you have any difficulties activating your MyUT account, please contact IT at helpdesk@utoledo.edu.

2. Visit the iRocket Portal and fill out the Graduate Initial I-20 Request form
   The iRocket Portal uses your University of Toledo UTAD username and password to submit eForms for
   review by OISSS staff. Problems accessing your iRocket Portal, please contact the International
   Office at oisss@utoledo.edu.

3. Submit supporting documents through the iRocket Portal
   All bank documents/scholarship letters must be dated within 30 days of submission - documents older
   than 30 days will not be considered. Complete the Certificate of Financial Responsibility form and
   upload that with your other financial documents.

Processing time for I-20 requests is approximately 3-5 business days, and the International Office does not send updates while they process electronic requests. The I-20 will be issued electronically via email after they have received all required supporting documentation.

DEFERRING YOUR APPLICATION

Applicants are admitted to the Graduate College and/or academic program for a specific term only. If an admitted applicant wishes to begin graduate coursework later than the admit term, the individual may request a deferral one time for up to twelve months. The deferral request option can be found on the Application Status Page. The deferral request will be processed through the academic department and if approved, forwarded to the Graduate College. The applicant will receive a letter stating the status of the deferral request. Deferrals apply to admission status only; offers of scholarship and/or stipend support cannot be deferred, but students may be eligible for funding upon enrollment. Applicants who do not enroll in the admitted program for the admit term or who do not receive approval for a deferral will have their application

cancelled. In order to be admitted to a subsequent term the applicant must submit a new application, including the application fee and any updated credentials.

CHANGE OF MAJOR

Applicants wanting to change their major or program before matriculation can do so on the Application Status Page. Once you have been registered for coursework, the change of major must be submitted using the Graduate Curriculum Change Form located in MyUT on the Advisor tab. The change of major must be initiated by the program advisor.

CONCURRENT ENROLLMENT – BGSU/UToledo

The University of Toledo and Bowling Green State University jointly sponsor this program, which allows graduate students at one institution to enroll and receive credit for classes offered at the other institution. The concurrent program provides graduate students the unique opportunity to enhance their academic experience by taking advantage of resources provided by the two institutions. Credit and grades earned count as resident credit at the home institution.

Students at these institutions must be admitted under the concurrent student status, and the approval of the Graduate College Dean of the student's home institution is required before a student receives credit and a grade for the class in which he/she has enrolled. In addition, graduate students from The University of Toledo who enroll at Bowling Green State University are required to complete a minimum of 51 percent of their courses in their degree programs on campuses of The University of Toledo. Part-time graduate students pay the instructional, general, and if applicable, the nonresident fees at the host institution on a per-hour basis. Full-time graduate students who have paid full-time instructional, general and nonresident fees at their home institution, or who are graduate assistants or teaching fellows at their home university, generally will not have additional charges associated with their concurrent registration; however special service fees and facilities fees apply.

READMISSION

If your matriculation has been closed due to an absence of one calendar year or more [three consecutive semesters, including summer], you must complete and submit an Application for Graduate Readmission. The fee for readmission is $50. This is for continuing in the same degree only. Directions for the Returning Student and the Faculty Member/ Academic Department are located on our Graduate Success Readmission webpage (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fgraduate%2Fsuccess-center%2Freadmission.html&data=05%7C02%7CTERESA.HAYES%40utoledo.edu%7C50eda97616c14240a78708dc9b936279%7C1d6b1707baa94a3da8f8dea9fb3d4675%7C0%7C0%7C638556304530620314%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=TJKmT5gi72k%2FJX4qYTRXbOITGmcrCL7QTvDfcGylUCc%3D&reserved=0) and outlined below. This is not initiated or processed through the graduate application system.

RETURNING STUDENT

- **The first step in the readmission process is to review the readmission application and connect with an academic advising contact or department chair from your academic department**. Your program contact will need to work with you to complete a new plan of study and determine if other forms may be necessary to submit. **Unsure who to reach out to?** Contact the College of Graduate Studies at GradSuccess@utoledo.edu to find your program contact!
- After consulting with your academic department, you will need to complete the readmission application and required documents. You will send the items to your academic department for signatures, and they will be forwarded to our office.
  - Readmission application (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fgraduate%2Fforms%2FRe-admissionApplication03222021.pdf&data=05%7C02%7CTERESA.HAYES%40utoledo.edu%7C50eda97616c14240a78708dc9b936279%7C1d6b1707baa94a3da8f8dea9fb3d4675%7C0%7C0%7C638556304530631935%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=CDhqvL%2Fo%2FeJENKJ43x04qoUeq7rh8to4tw6afgh9e8Q%3D&reserved=0)
  - Updated Plan of Study (https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.utoledo.edu%2Fgraduate%2Fcurrentstudents%2Facademicprogramforms%2F&data=05%7C02%7CTERESA.HAYES%40utoledo.edu%7C50eda97616c14240a78708dc9b936279%7C1d6b1707baa94a3da8f8dea9fb3d4675%7C0%7C0%7C638556304530640472%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=9BWrVXFlrJOicdRilfhXz2EkiUZCt8TnA%2FdWNL0bvuw%3D&reserved=0)
- If approved, you will receive an email with a link to pay the $50 readmission fee and will be prompted to complete the Student Conduct & Community Standards webform.
- Our office will complete the process and reopen your matriculation for registration, notifying you via email to your Rockets email address.

ADMISSION WITH ADVANCED STANDING

Certain doctoral programs admit students with a baccalaureate degree directly into the Ph.D. program, where the student must complete a minimum of 90 credit hours for the degree. Some programs may waive up to 30 credit hours for an incoming student who holds an eligible earned master's degree, thus requiring a minimum of 60 doctoral-level credits to complete the Ph.D.

The evaluation of prior earned degrees and the decision to waive credit requirements is the decision of the program admissions committee based on faculty expertise and is typically articulated as part of the Plan of Study and/or funding opportunities. Those admitted with advanced standing are not eligible to earn another master's degree (master's along the way) from the remaining 60 credits.

ADMISSION THROUGH A PIPELINE PROGRAM

Some students may elect to enter a graduate program as part of a pipeline program, or "combined bachelor's to master's degree". Undergraduate students can take up to 9 graduate credits while still finishing their undergraduate degree, paying the undergraduate tuition rate, and the credits apply to both the undergraduate degree and the graduate degree. Upon receiving the baccalaureate, the student

continues as a graduate student in their admitted program to finish the graduate degree. Students are strongly urged to consult with advising to explore pipeline options and to create the best plan and timeline.

GUIDELINES

- Students must have a minimum 3.0 GPA to apply for a pipeline program
- Students must have completed a minimum of 60 credit hours to be eligible to apply to a pipeline program
- Students must have completed a minimum of 75 credit hours before they are eligible to register for a graduate-level course
- Students must still meet other program admission requirements to gain admission to a graduate program

Academic Regulations

- Responsibilities of Graduate Students (p. 412)
- Academic Standards (p. 412)
- Academic Fresh Start (p. 413)
- Courses for Graduate Study (p. 413)
- Advising (p. 414)
- Plan of Study (p. 414)
- Graduate Research Advisory Committee Approval & Assurances (GRAD) Form (p. 414)
- Defense Acceptance and Intellectual Protection (p. 414)
- Approval of Project/Thesis/Dissertation Forms (p. 415)
- Minimum Enrollment (p. 415)
- Transfer of Credits (p. 415)
- Master's Thesis (p. 416)
- Doctoral Dissertation (p. 416)
- Master's Along the Way (p. 417)
- Graduation Procedures (p. 418)
- Residence Requirements for the Ph.D. and Ed.D. Degrees (p. 419)
- Time Limitations for Degrees (p. 419)

Responsibilities of Graduate Students

Graduate students are expected to become familiar with the academic regulations of the University and the specific requirements of their graduate program. The student is solely responsible for complying with all regulations of the University, the College of Graduate Studies and the department/program of instruction, and for meeting all requirements for the degree. Regulations and requirements may also be referenced in the university catalog, the university policy webpage, and the degree program handbook or webpage. The student should consult with their advisor on a regular basis to ensure that they remain on track within the degree program or in the event that there are any questions concerning the requirements for the degree.

Academic Standards

Academic Standards and Graduate Course Grades

Minimum GPA Requirement for Graduation

To be eligible for graduation, graduate students must maintain a minimum cumulative grade point average (GPA) of **3.0 on a 4.0 scale** in all graduate coursework applied toward the degree.

Academic Probation and Dismissal

Graduate students whose cumulative GPA falls below 3.0 at the end of any semester will be placed on **academic probation**.

Students on probation must restore their cumulative GPA to at least 3.0 within the timeframe established below:

- **Full-time students:** One semester, or at most two semesters (excluding summer terms), depending on program requirements.
- **Part-time students:** Within the next 12 credit hours of graduate coursework.

Students who fail to meet the required GPA standard within the prescribed timeframe are subject to dismissal from their graduate program.

Graduate grades

Graduate courses may be assigned grades of **A, A-, B+, B, B-, C+, C, C-, D+, D, D-, F, S, U, WP,** or **WF**, in accordance with college, department, and program policies.

A grade of **C (2.0)** is the minimum passing grade for a graduate course. Courses in which a student earns a grade below **C** or a grade of **U (Unsatisfactory)** may not be used to fulfill degree requirements. Grades below C remain part of the student's academic record and are included in the calculation of the cumulative GPA.

Some graduate courses are graded on a satisfactory/unsatisfactory basis. A grade of:

- **S (Satisfactory)** earns graduate credit but is not included in the GPA calculation.
- **U (Unsatisfactory)** earns no credit and is not included in the GPA calculation.

A grade of **WP (Withdrawal Passing)** is not included in the GPA calculation. A grade of **WF (Withdrawal Failing)** is treated as a grade of F in the GPA calculation. These grades will be assigned to students who withdraw after the university established withdrawal period at the discretion of the instructor.

Incomplete Grades

The grade of **IN (Incomplete)** may be assigned when extraordinary circumstances prevent a student from completing course requirements during the term of enrollment.

An incomplete grade must be resolved by the end of the following semester (excluding summer terms), unless an extension is approved by the instructor and the appropriate college authority. The grade of IN is not included in GPA calculations while it remains on the student's record.

Students may not graduate with unresolved **IN** or ***PR (In Progress)** grades on their transcript or Plan of Study.

Course Repeats

Graduate programs may permit students to repeat a limited number of courses in which grades of C or below were earned. Individual colleges, departments, and degree programs may establish specific course repeat policies, subject to the following maximum limits:

- No more than **two courses** may be repeated.
- No more than **12 total credit hours** may be repeated.
- Each eligible course may be repeated **one time only**.

Both the original grade and the repeated grade will remain on the official transcript and will be included in the calculation of the cumulative GPA.

Program-Specific Academic Requirements

Graduate programs may establish academic standards that exceed the minimum requirements outlined in this policy, including higher grade requirements for specific courses or degree completion. Students are responsible for consulting their graduate program director regarding any additional program-specific academic standards.

***Special Note on PR grades:** Prior to 2024, the grade of PR may have been awarded to indicate work in progress for thesis or dissertation hours. This grade is no longer assigned, and faculty are now regularly assigning S, U, or IN. Students may not graduate with a PR on their transcript or Plan of Study.

Academic Fresh Start

Purpose

This policy allows eligible graduate students to request the exclusion of prior University of Toledo graduate coursework from the calculation of their cumulative graduate grade point average (GPA).

Eligibility

To be considered for a Graduate Academic Fresh Start, the student must meet **all** of the following requirements:

- Be a **degree-seeking graduate student**
- Have **previously enrolled** at The University of Toledo
- Have **not been enrolled for at least two years** prior to current enrollment
  - *Exception:* Under exceptional circumstances, a student may petition the College of Graduate Studies for a waiver of the two-year requirement
- Demonstrate academic success upon re-enrollment by achieving:
  - A **minimum 3.0 graduate GPA** during:
    - The **first semester** of re-enrollment (full-time students), or
    - The **first 12 credit hours** (part-time students), not to exceed three semesters

Approval Process

The petition must be:

- Reviewed and approved through the appropriate academic college channels
- Submitted to the College of Graduate Studies
- Approved by the Vice Provost for Graduate Affairs

Policy Provisions (If Approved)

If the petition is granted, the following conditions apply:

GPA Recalculation

- The policy applies only the cumulative graduate GPA
- Earned credit hours are not affected

Transcript Record

- All grades from prior enrollment will remain on the official transcript
- The policy does not remove or alter the academic record
- Only the GPA calculation is adjusted

Use of Prior Coursework

- Courses from prior graduate enrollment:
  - Cannot be counted toward current degree requirements
  - Are excluded from GPA calculations
- Degree requirements must be met only with coursework included in the recalculated GPA

Important: Approval of this petition results in the permanent forfeiture of the ability to apply excluded coursework toward the current degree.

Transfer Credit Restriction

- Credit earned at other institutions during the required two-year non-enrollment period is not eligible for transfer credit

One-Time Use

- This option may be exercised only once
- It is not available again, regardless of:
  - Number of re-enrollments
  - Number of graduate programs pursued

The Academic Fresh Start option applies only to students re-enrolled in the summer 2011 term or beyond. Students re-enrolled prior to summer 2011 are not eligible.

Related link: Petition for Academic Fresh Start (https://www.utoledo.edu/graduate/forms/Academic_Fresh_Start_Petition.pdf)

Courses for Graduate Study

Credit toward a graduate degree is given for completion of courses designed for graduate students (5000-8000 level). University course numbers follow this system at the graduate level:

5000-5990	Master's level
6000-6990	Advanced master's level

7000-7990	Doctoral level
8000-8990	Advanced doctoral level

REGISTRATION

A student must be matriculated into a graduate-level degree program or be admitted as a graduate non-degree seeking student in the College of Graduate Studies in order to earn graduate credit. A student must be enrolled through the university's official registration and enrollment information system in order to receive transcripted credit for any course. Specific policies and procedures regarding student academic records and course registration is maintained by the Office of the Registrar. (https://www.utoledo.edu/offices/registrar/)

Advising

The College of Graduate Studies at UToledo places a high priority on a program of faculty advising for students. After a student has been accepted for graduate study by the Graduate College, a faculty program contact is appointed by the admitting program. The program contact is listed on the admission letter as well as the student's dashboard in the MyUT portal. The student should address questions concerning the program to the faculty member and seek advice prior to registration. As the student progresses through the degree program, new or additional advisors (i.e. thesis advisor) may be added. All questions regarding advising should be directed to the academic college, department, or program. The College of Graduate Studies works with the advisor/program as identified on the required academic program forms (i.e., Plan of Study and GRAD form), but we do not provide academic advising.

Plan of Study

By the end of the first semester, but no later than the completion of 12 credit hours, graduate students must submit to the College of Graduate Studies a Plan of Study approved and signed by the student, graduate advisor, department chair or program director, and the associate dean of the college (or designee). The Plan of Study is a listing of courses and other requirements that a student must complete to fulfill the minimum requirements of the graduate degree program. The College of Graduate Studies checks the student's record against the Plan of Study to verify eligibility for graduation. The Plan of Study forms are available on the College of Graduate Studies' website and the Graduate tab of the MyUT portal and should be submitted to GCAcademicSvcs@utoledo.edu.

Special Note on DAR/uAchieve Self-Service Degree Audit: We are in an ongoing process of replacing the paper Plan of Study with the online DAR system (self-service degree audit available through your MyUT portal). This is being done by degree program. You can verify with your program or contact the College of Graduate Studies to see if your degree program is using the DAR or still requires the Plan of Study form. If your degree program is not yet utilizing the DAR system, the results of a self-service audit will not be accurate.

Regardless of whether your program utilizes the paper Plan of Study or the self-service degree audit, you can find sample Plan of Studies in your program's catalog listing, and in addition to utilizing the DAR, you can prepare a paper Plan of Study for your own reference. This should be done in consultation with your degree program.

Specific questions on degree requirements, course selection, and registration should be directed to your advisor or degree program.

Graduate Research Advisory Committee Approval & Assurances (GRAD) Form

The purpose of the GRAD form is:

- To document and approve the formation of the scholarly project, thesis, or dissertation committee in compliance with Graduate Faculty committee membership categories and the graduate catalog
- To document the committee's approval of the topic and research approach and awareness of the federal requirements for institutional review of research methods
- To document required approvals are obtained **prior to** beginning any research for a scholarly project, thesis, or dissertation involving humans, animals, radiation, or biohazardous substances in compliance with institutional and federal regulations

Students must receive the required approvals **prior to** beginning any research for a scholarly project, thesis, or dissertation involving humans, animals, radiation, or biohazardous substances. Federal regulations do not allow retroactive approval. Completion of the GRAD form indicates that a student's committee has approved both a topic and an approach for the research and is aware of federal requirements for institutional review of research methods. Policy information and required applications referenced on the GRAD form are available on the Research & Sponsored Programs website (https://www.utoledo.edu/research/rsp/).

This form typically should be completed at the time the student determines the nature of the research project. However, in all cases the student must have submitted the form demonstrating compliance before engaging in related research. **Failure to obtain the proper approvals could prevent or significantly delay the awarding of the degree.** Compliance with federal and state regulations is essential to assure continued funding of the University research programs and, therefore, requires cooperation of all University researchers.

If a student works on a project that is supported by a research grant or contract between the University and an external entity or entities, the student must comply with all terms of the grant or contract. Contractual agreements in support of research or other sponsored activities are legally binding on the University, including the administration, faculty and students engaged in the sponsored projects.

This form is located on the College of Studies website and the Graduate tab of the MyUT portal. It can be filled out and signed electronically and should be submitted to GCAcademicSvcs@utoledo.edu (gcacademicsvcs@utoledo.edu).

Defense Acceptance and Intellectual Protection

Students with a thesis or dissertation degree requirement must complete this two-part form with their faculty advisor for approval to present/defend their paper, as well as ensure that any invention or proprietary

information contained in the thesis/dissertation and presentation/defense of the paper is legally protected. The Defense Acceptance and Intellectual Protection form (DAIP) is due immediately upon scheduling the defense date. Completing this form ensures that access to the thesis/dissertation or presentation/defense, which might disclose an invention, is determined at the direction of the student and faculty advisor (i.e. open/closed defense, publication delay). Upon public disclosure of an invention, all international patent rights are lost, and a one-year bar date is set to file a patent in the U.S., or all rights are lost. This form is found on the College of Graduate Studies website and the Graduate tab of the myUT portal and should be emailed to ETDsvcs@utoledo.edu (etdsvcs@utoledo.edu).

Publication Delay or Embargo

This form is used to request a publication delay (embargo) of your thesis/dissertation on the OhioLINK ETD Center. Delays are granted in one-year increments and are renewable up to five years in total (with additional documentation). The publication delay request selected in the OhioLINK submission system must match the request on the DAIP. Expiration of the delays are based on the term of graduation. Spring: May 31. Summer: August 31. Fall: December 31.

RENEWAL of Publication Delay/Embargo

This form should be used to request a renewal of a delay. The student information should be filled out, and on the second page, the box checked for renewal along with the reason for renewal and the best email address to send the confirmation. The renewal request should be sent one month prior to the expiration. Spring: April 30. Summer: July 31. Fall: November 30.

Approval of Project/Thesis/Dissertation Forms

The Approval form (Thesis, Dissertation) is signed by the student and the committee, and signifies the successful defense, acceptance of and approval to submit in partial fulfillment of the degree requirements to graduate faculty via upload to the OhioLINK ETD Center. The Approval of Scholarly Project signifies the acceptance of the project by the academic college in satisfaction of the degree requirements (scholarly projects are not uploaded to OhioLINK)

This academic form, which is available on the College of Graduate Studies' website and on the Graduate tab of the MyUT portal, is required of all graduate students completing a scholarly project, thesis, or dissertation requirement. The form should be completed and signed by all except the Vice Provost for Graduate Affairs. Our office obtains the VP's signature. The form should be emailed to GCAcademicSvcs@utoledo.edu by the end of the term. If it is sent after the term ends, it can cause delay in graduation processing.

Minimum Enrollment

Graduate students who have completed their course work and are working on their project, thesis or dissertation, and/or using University facilities and services (i.e., the library, health services, computer services, laboratories, consulting with faculty, apply for graduation, etc.) must register for a minimum of one graduate credit hour each semester, excluding summer terms. If the student applies for graduation during the summer term, they must be registered*** for a minimum of one graduate credit hour. Access to certain other facilities and services, such as the Student Recreation Center and parking, will require additional user fees.

***Completion of an incomplete (IN), in progress (PR) or non-recorded (NR) grade will not fulfill the registration requirement.

Students who are not enrolled during any time over one calendar year (three consecutive semesters, including summer) will be considered to have stopped their graduate programs and will be required to apply for readmission in order to complete their programs.

Transfer of Credits

Graduate courses completed at other *appropriately accredited academic institutions or at an academic institution with high academic standards deemed appropriate and acceptable by the academic department, academic college, and the College of Graduate Studies may be offered in partial fulfillment of the requirements for graduate degrees at The University of Toledo subject to the limits and approvals described below.

*Courses requested for transfer from a non-United States institution will be evaluated on an individual basis. To be considered, the credits to be transferred must have been earned in a program judged by the University graduate program to be comparable to a graduate degree program of a regionally accredited institution in the U.S. and appropriate documentation must accompany the request.

Limits and Approvals

- All graduate credits requested for transfer must carry a grade of A, A-, B+, or B. Credit for an S grade may be transferred only if the granting institution verifies, in writing, that the S translates into a grade of B or higher. Research hours earned at another university are not transferable towards research hours for a project, thesis, or dissertation. Courses taken for professional development cannot be transferred for graduate credit.
- The student must have been admitted and enrolled as a graduate student at the institution where the graduate credit was completed.
- The student is actively pursuing a graduate degree program at UToledo.
  - Transfer of credit is not appropriate for graduate, non-degree students as they have no graduate degree program toward which credit can be transferred. If a graduate non-degree student becomes regularly admitted to a graduate degree program, transfer of credit can then be requested. (Graduate courses completed at UToledo in non-degree status and later applied toward degree requirements are not considered as transfer credit from outside the University.)
- Credit applied towards the master's degree and education specialist degree must have been earned within the period of six years immediately preceding the time the degree is awarded, credit applied for the doctoral degree must have been earned within seven years immediately preceding the time the degree is awarded (combined M.D./Ph.D. program limit is ten years). Credit applied towards a graduate certificate must have been completed within the four years immediately preceding the time the certificate is awarded. Transfer credit is reviewed at the time of graduation to confirm time-to-degree limits. If the previously approved transfer credit is beyond the time

limitation for the degree, it can no longer be used to fulfill degree requirements. Transfer credits are not eligible for recertification.

- The credit requested for transfer must not have been applied in whole or in part toward any other degree from another university. Requests for transfer of credits, applied in whole or in part toward a graduate *certificate* from another university, will be reviewed on a case-by-case basis by the College of Graduate Studies. The final determination will be made by the Vice Provost for Graduate Affairs.
- The amount of credit transferred does not exceed one-third of the hours required for the graduate degree or certificate. Requests for exceptions to this requirement will only be considered with supporting documentation and would only be approved in unusual circumstances. Academic colleges, departments, and/or programs may have more restrictive policies with regard to the number of transferable credits or eligibility of specific courses.
- The College of Graduate Studies will only review and consider transfer credit after it has been reviewed and approved through the required channels of the student's academic department and college. *Please visit the University Policy Website to view the complete policy*. All policies are subject to updating.

Request for Transfer Credit Process

- Application for transfer of credit must be made to the student's advisor on a Request for Transfer Credit (https://www.utoledo.edu/graduate/forms/TransferCred.pdf) form available on the College of Graduate Studies' website. Please use one form for each institution from which transfer credit is requested. Each request must be endorsed by the academic college or department and sent with the following items to the College of Graduate Studies at the Graduate Academic Services (gcacademicsvcs@utoledo.edu) email.
  - **Official Transcript** from the accredited institution must be attached or sent directly from the institution to the College of Graduate Studies. Transfer credit will not be processed from a copy. If the official transcript has already been sent or is on file, please attach a note indicating that it was sent previously.
  - **A Plan of Study** for the degree program. If an approved Plan of Study is already on file, an amended Plan of Study or Plan of Study Course Substitution (https://www.utoledo.edu/graduate/forms/CourseSubPOS.pdf) form must accompany the request. Still required even if the program is using the DAR/uAchieve system.
  - **The Course Description** from the institution at which the course was completed. Students may also be asked to provide a statement from the institution confirming the course was not used towards a prior degree.
- Final approval for transferred credit is granted only by the Vice Provost for Graduate Affairs or designee. Any prior assurances for transfer of credit given by faculty or staff must be regarded as professional opinions and do not commit the University to final approval of the credits.
- Once final approval has been granted and official transcripts received and verified, the credit hours (not grades) for the approved courses are transferred to the student's UToledo graduate degree program and appear on the transcript.

Master's Thesis

Certain programs specify the submission of a thesis as a requirement for the master's degree. If a thesis is required, the student must meet with the advisor to determine the appropriate paperwork and establish a timeline to meet all requirements of the academic department, academic college, and College of Graduate Studies. Students are required to submit their document electronically by uploading to the OhioLINK ETD Center and to publish their document with ProQuest by selecting the transfer paper option in OhioLINK. The deadline for depositing the thesis with the OhioLINK ETD Center is by 11:59 pm on the last Friday of each term (Fall, Spring, Summer). No extensions are given. If a student fails to meet the submission deadline, they will need to register for the following term and reapply for graduation. The thesis must be successfully defended and approved prior to submission. The defense process is directed by the student's committee and department. Procedures for proper submission of a thesis, including The Manual for the Formatting of Graduate Dissertations and Theses, templates, and other resources are all available on the College of Graduate Studies website and the Graduate tab of the myUT portal.

Composition of Master's Thesis Committee

A master's thesis committee must consist of a minimum of three members, all of whom must be members of the graduate faculty. An expert from outside the University also may serve as one of the three thesis committee members upon recommendation of the committee chair and approval by the department chair and the Vice Provost for Graduate Affairs. Full membership on the graduate faculty is a prerequisite to chairing a master's thesis committee.

Composition of Master's Scholarly Project Committee

Associate membership on the graduate faculty is a prerequisite to chairing a master's project committee. A master's project committee must consist of a minimum of two members. Master's Scholarly Projects are not submitted to the OhioLINK ETD Center.

Composition of clinical Masters and Doctoral Level Scholarly project Committees

The MSBS clinical track, including Physician Assistant studies, Doctor of Physical Therapy, and the Occupational Therapy Doctorate advisory committees are composed of a minimum of one member. The Doctor of Nursing Practice committee consists of a chair and two other graduate faculty members, who need to have full or adjunct Graduate Faculty status. Doctoral Scholarly Projects are not submitted to the OhioLINK ETD Center.

Doctoral Dissertation

All departments require a dissertation in partial fulfillment of the PhD. The dissertation should constitute an original work of a scholarly nature. The student must meet with the advisor to determine the appropriate paperwork and establish a timeline to meet all requirements of the academic department, academic college, and College of Graduate Studies. Students are required to submit their dissertation electronically by uploading to the OhioLINK ETD Center and to publish their document with ProQuest by selecting the transfer paper option in the OhioLINK ETD Center submission process. The deadline for depositing the dissertation with the OhioLINK ETD Center is by 11:59 pm on the last Friday of each

term (Fall, Spring, Summer). No extensions are given. If a student fails to meet the submission deadline, they will need to register for the following term and reapply for graduation. The dissertation must be successfully defended and approved prior to submission. The defense process is directed by the student's committee and department. Procedures for proper submission of a dissertation, including The Manual for the Formatting of Graduate Dissertations and Theses, templates, and other resources are all available on the College of Graduate Studies website and the Graduate tab of the myUT portal.

Composition of Dissertation Committee

Full membership on the graduate faculty is a prerequisite to chairing a doctoral dissertation committee. A doctoral dissertation committee must consist of a minimum of four members. One of the four members must be an external committee member whose primary appointment is outside the candidate's program or department, or may be outside the University. The external member must be familiar with the standards of doctoral research in the field of the dissertation and should be in a field related to the student's dissertation topic. Those committee members who are tenured or tenure-track UToledo faculty must be members of UToledo's graduate faculty. An expert from outside the University may serve on the doctoral dissertation committee upon the recommendation of the committee chair, and approval by the department chair and the graduate dean. The request, along with the Graduate Faculty Membership Application (https://www.utoledo.edu/graduate/facultystaff/gradcouncil/docs/grad-faculty-membership-app.pdf) and reader's curriculum vita, must be submitted to the College of Graduate Studies for approval prior to committee appointment.

The composition of the doctoral dissertation committee is recommended by the chair of the committee in consultation with the student; it requires concurrence by the relevant department/program director, the dean (or designate) of the academic division, and approval by the Vice Provost of Graduate Affairs.

Master's Along the Way

The Master's Along the Way (MATW) is an earned master's degree awarded to a graduate student who was admitted and matriculated to a Ph.D. program direct from the baccalaureate degree, and who is working towards the doctoral degree. This degree is intended for students who will continue work on their Ph.D. and does not apply to qualified students who are leaving the Ph.D. program after obtaining a master's degree (referred to as "mastering out").

Select Ph.D. programs are offering this opportunity to earn a master's degree for qualified students. The College of Graduate Studies supports this opportunity and has established the following qualifications and procedures for the process of granting a MATW degree.

qualifications

- Student must be actively enrolled in a doctoral program and in good academic standing
- Must be in an approved MATW program (see list)
- MATW must be in the same college and major as the Ph.D. (i.e. if earning a Ph.D. in Biology, the MATW would be the M.S. in Biology)
- Students with an earned master's degree in the same field are not eligible for a MATW, regardless of where the degree was earned
- Students admitted with advanced standing (waiving up to 30 hours in a 90-hour degree) into a Ph.D. program are also not eligible for a MATW, even if the master's degree used to establish advanced standing is from a different field of study

Procedures

STUDENT

- Must submit their intent to earn the MATW to their advisor/program and complete the degree requirements within three calendar years of their matriculation into the Ph.D. program
- Must file a Plan of Study that meets all requirements for the master's degree as outlined in the catalog and by the department/program, and also complete all other academic forms/processes and meet graduation deadlines as required.
- After the matriculation has been added to the student's record, the student must apply to graduate with the degree and will be audited and cleared through the College of Graduate Studies.

DEPARTMENT/PROGRAM

- Must advise the student and approve the Plan of Study, verifying that the student qualifies for the MATW, and indicate on the form that it is a MATW. Submission of the MATW Plan of Study constitutes the request to add the matriculation.
- The Plan of Study must note any deviations from the catalog, as well as identify whether thesis, non-thesis, project, etc. is required. Do not include any requirements related to the Ph.D. or that are not required for the master's degree. Any related academic program forms must accompany the Plan of Study.
- Requests to add the MATW that come in after census date may not be processed by the registrar's office until the following term. **We strongly recommend submitting MATW requests the term PRIOR to intended graduation.** Submit all requests and questions about the MATW to GradStudies@utoledo.edu (gradstudies@utoledo.edu).

GRADUATE STUDIES

- Receive, process, and approve all MATW requests
- Add the matriculation to the student's record in Banner via filing the Curriculum Change Form on behalf of the requesting program/faculty advisor
- Notify the student to apply for graduation
- Process and clear the student for the degree
- Maintain list of all approved MATW programs
- Update list annually for new catalog term

MATW Approved List

Natural Sciences & Mathematics

- M.S. in Biology: Cell and Molecular Biology Concentration [Ph.D. in Biology: Cell and Molecular Biology Concentration]
- M.S. in Biology: Ecology and Organismal Biology Concentration [Ph.D. in Biology: Ecology and Organismal Biology Concentration]
- M.S. in Chemistry [Ph.D. in Chemistry]
- M.S. in Physics [Ph.D. in Physics]
- M.S. in Mathematics [Ph.D. in Mathematics]

Engineering

- M.S. in Bioengineering [Ph.D. in Engineering with a concentration in Biomedical Engineering]
- M.S. in Chemical Engineering [Ph.D. in Engineering with a concentration in Chemical Engineering]
- M.S. in Electrical Engineering [Ph.D. in Engineering with a concentration in Electrical Engineering]
- M.S. in Computer Science & Engineering [Ph.D. in Engineering with a concentration in Computer Science & Engineering]
- M.S. in Mechanical Engineering [Ph.D. in Engineering with a concentration in Mechanical Engineering]
- M.S. in Industrial Engineering [Ph.D. in Engineering with a concentration in Industrial Engineering]
- M.S. in Civil Engineering [Ph.D. in Engineering with a concentration in Civil Engineering]

Pharmacy

M.S.P.S. in Pharmacology/Toxicology [Ph.D. in Experimental Therapeutics]

Arts, Education, and Social Sciences

M.A. in History [Ph.D. in History]

Graduation Procedures

Students must apply for graduation to receive their degree or graduate certificate. Failure to apply for graduation will necessitate registering and applying for graduation the following term. Students should apply for graduation by the posted deadline for the term, but no later than the last day of the term. Late application for graduation will cause the student to miss important communications from the College of Graduate Studies and the Registrar's Office, as well as delay the degree audit process. A one-time graduation services fee of $125.00 will be assessed the first time a student applies to graduate from a degree program (graduate certificates are excluded) and the payment portal link will be sent during the degree audit process to the student's Rocket email. Graduation information (deadlines, application, diploma, transcripts, etc.) is available on the Registrar's Office's website (https://www.utoledo.edu/offices/registrar/graduation.html) and the College of Graduate Studies Graduation & Commencement Toolkit (https://www.utoledo.edu/graduate/success-center/graduation-and-commencement-toolkit.html).

It is the responsibility of the student to meet all requirements for graduation. To ensure graduation proceeds as planned, it is important for students to meet with their advisor very early in the semester of intended graduation or even during the semester prior. Graduate students completing all degree requirements will receive the official diploma approximately four to six weeks after the commencement ceremony. The degree will be posted to the official transcript between five and forty days after the commencement ceremony. Students who fail to graduate in the semester for which they have applied must submit a new application for a future term.

The University graduation exercises (commencement) are conducted to honor those who have earned their degrees. The graduate is encouraged to attend the commencement exercises. Candidates shall wear academic dress with appropriate hoods. Arrangements for academic dress must be made through the University Bookstore well in advance of commencement. The student should contact the University Bookstore early in the semester of graduation. Participation in the commencement ceremony is not a guarantee of graduation. Two University ceremonies are held a year--spring and fall. Summer graduates are automatically invited to the fall ceremony, but if they wish to participate in the spring ceremony, they must apply for graduation no later than the fifth week of the spring term. Some colleges hold separate commencement exercises, and these are announced well in advance.

Early Filing for Graduation

Early Filing is a graduation status option which allows a graduate student who applied to graduate but missed the deadline to submit their electronic thesis/dissertation (ETD) to the OhioLINK ETD Center due to extenuating circumstances, to reapply for graduation the following term and have the mandatory registration requirement of one graduate-level credit hour waived.

What Early Filing does: Early Filing waives the registration requirement for the reapplied term of graduation, which saves the student money; allows speedier degree posting and diploma mailing after the term ends; allows COGS to write letters for the student affirming that all graduation requirements were met prior to the degree award date.

What Early Filing does not do: Early Filing does not allow the student to graduate in the term they originally applied for; does not extend the deadline or give a 'grace period' for submission of the ETD; does not award the degree before the end of the term for which the student has reapplied to graduate.

Who Qualifies: A graduate student completing a thesis or dissertation (not a scholarly project); currently registered and applied for graduation; failure to meet the ETD submission deadline is the result of extenuating circumstances beyond the student's control (will require documentation/confirmation from adviser or department). The following students should verify potential impacts on their status: International Students, Financial Aid Recipients, and Assistantship Recipients.

When to Apply: Strive to meet the graduation deadline for your current term. After the term has ended and you have missed the ETD deadline, please submit the application if you quality. If you know prior to the end of the term that you will not meet the deadline, e.g. your committee would/could not schedule the defense prior to the submission deadline, etc., then you may turn in your Early Filing application at that time. Under no circumstances should you submit this application if you do not meet the qualifications.

As an Early Filer, the student will not be registered during the term of intended graduation and will have limited or no access to campus resources and services, including but not limited to department administrative assistance, faculty advising, the libraries, or the recreation center. To be an Early Filer, the student must meet all graduation/degree requirements [ETD, forms, fees, etc.] by 12:00 pm (noon) the Friday prior to the beginning of the next term.

Additional information is included in the *Early Filing for Graduation Application*, which is available on the College of Graduate Studies website.

Students seeking Early Filing status must complete the application and send it to GCAcademicSvcs@utoledo.edu.

Residence Requirements for the Ph.D. and Ed.D. Degrees

The College of Graduate Studies has established an academic residency requirement in order to provide doctoral students with the opportunity to engage in intensive, concentrated study over an extended period of time in association with faculty members and other students in an atmosphere conducive to a high level of intellectual and scholarly activity.

The purpose of a residency requirement is to encourage doctoral students to experience contact with the academic community: colleagues, libraries, laboratories, ongoing programs of research and inquiry, and the intellectual environment that characterizes a university. Such experience is generally as important as formal classwork in the process of intellectual development. Although the residency requirement is, by necessity, given in terms of full or part-time enrollment, the intent of the requirement is to ensure that the student becomes fully engaged in an essential part of scholarly life.

Doctoral students satisfy the doctoral residency requirement by completing a total of 18 hours of coursework taken over 3 consecutive semesters. Enrollment in a summer term is not required to maintain continuity, but credits earned during summer terms could count toward the 18 hours required for residency. Each graduate program may exclude certain courses and credit hours from meeting the residency requirement.

Any exceptions to the residency requirement must be requested in writing. For students who have been determined by their academic college to need an exception to this requirement, the request must be attached to a Plan of Study and include information detailing how a student will interact with faculty and other students, read widely within and beyond the major field, and contemplate scholarly issues as they relate to professional practice.

Time Limitations for Degrees

Credit applied toward the master's and education specialist degree must have been earned within the period of six years immediately preceding the time the degree is awarded. Credit applied for the doctoral degree must have been earned within seven years immediately preceding the time the degree is awarded (combined M.D./Ph.D. program limit is ten years). Certificate programs must be completed within four years.

An extension of the time limit for the degree may be requested by a student by written petition to the College of Graduate Studies. Students requesting a one-year extension of coursework will complete the *Continuation of Matriculation* form. This is used for first extension requests of one year only. Students requesting an extension beyond the first year will complete the *Request for Time Extension & Course Recertification* form. These forms are initiated with the program, completed and approved before submission to the College of Graduate Studies. There are associated fees with both types of extension requests. The forms are available on the College of Graduate Studies' website and the Graduate tab of the MyUT portal.

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Accounting (ACCT)

ACCT 5000 Financial And Managerial Accounting
[3 credit hours]
The study of the principles of Financial and Managerial accounting. The financial accounting segment of the course will focus on the preparation, interpretation and analysis of financial statements and the use of the financial information. The managerial accounting segment of the course will focus on an introduction to cost accounting, managerial accounting concepts and the use of accounting information in managerial decision-making.
Term Offered: Spring, Summer, Fall

ACCT 5100 Data Analytics in Accounting
[3 credit hours]
This class focuses on the skills necessary to analyze, visualize, and effectively communicate information captured by accounting data in written and visual form.
Term Offered: Spring, Summer, Fall

ACCT 5110 Intermediate Financial 1
[3 credit hours]
This course covers accounting topics applicable to asset valuation, income measurement and financial statement disclosure. It concentrates on accounting for corporations and emphasizes the accounting cycle and the asset side of the balance sheet.
Prerequisites: BUAD 2040 with a minimum grade of C and BUAD 2050 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 5120 External Financial Reporting II
[3 credit hours]
This class concentrates on financial accounting for coporations and emphasizes the liability and owner's equity sections of the balance sheet and related income statement issues.
Prerequisites: ACCT 3110 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 5210 Individual Taxation
[3 credit hours]
This class focuses on the concepts and principles applicable to the taxation of individuals.
Term Offered: Spring, Summer, Fall

ACCT 5310 Accounting Information Systems and Controls
[3 credit hours]
This course provides an introduction to processing and reporting of accounting information. Major emphasis is placed on basic accounting information processing including accounting applications in an advanced information technology environment.
Term Offered: Spring, Summer, Fall

ACCT 5320 Cost Accounting
[3 credit hours]
This course focuses on budgeting, product and service costing, and the ability to recognize and provide management with relevant information for strategic cost management and performance evaluation. This class will include a project for additional analysis. Prerequisite: Acct 5100 with a grade of C (2.0) or better.
Term Offered: Spring, Fall

ACCT 5420 Auditing
[3 credit hours]
Auditing integrates financial and cost accounting, ethics, accounting theory, information systems and control structure concepts into a systematic process of obtaining, evaluating and reporting on economic events and activities.
Prerequisites: (ACCT 3110 with a minimum grade of C and ACCT 3310 with a minimum grade of C) or (ACCT 5310 with a minimum grade of C and ACCT 5110 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

ACCT 5940 Internship
[1-3 credit hours]
A combination of practical experience at a business concern with discussion to be held at the University with others in the program. An oral and written report is required.
Term Offered: Spring, Summer, Fall

ACCT 6130 Advanced Financial Accounting
[3 credit hours]
This is the third course in the external financial reporting sequence. This course covers topics such as foreign exchange, partnerships, business consolidations and mergers.
Prerequisites: ACCT 3120 with a minimum grade of C or ACCT 5120 with a minimum grade of C
Term Offered: Spring, Fall

ACCT 6190 Contemporary Accounting Problems
[3 credit hours]
An overview of current topics and issues concerning the accounting profession. The course will focus on, but not be limited to, topics in external financial reporting.
Prerequisites: ACCT 6130 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 6250 Corporate Taxation
[3 credit hours]
This course covers the taxation of corporations, their shareholders, and other business entities. Topics include the formation, taxation of income, and the tax treatment of distributions.
Prerequisites: ACCT 3210 with a minimum grade of C and ACCT 5120 with a minimum grade of C or ACCT 3120 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 6260 Taxation of Pass-Through Entities
[3 credit hours]
This course focuses on the U.S. federal taxation of pass-through entities such as Subchapter S corporations, limited liability companies, and partnerships.
Prerequisites: ACCT 3210 with a minimum grade of C or ACCT 5210 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 6270 Tax and Business Strategy
[3 credit hours]
This course involves the integration of tax laws with the fundamentals of accounting, corporate finance, and microeconomics to evaluate how taxes impact business decision making including a business's operational tax environment, as well as how the business structures transactions.
Prerequisites: ACCT 4250 with a minimum grade of C or ACCT 6250 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 6310 Managerial Accounting and Decision Making
[3 credit hours]
Use of accounting information in planning and controlling an organization, including case studies in cost-volume-profit, budgeting, transfer pricing and performance evaluation.
Prerequisites: ACCT 3320 with a minimum grade of C or ACCT 5320 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 6330 AIS Process, Technology, and Analytics
[3 credit hours]
Additional analysis of processing and reporting accounting information. Major emphasis is placed on accounting information processing including accounting applications in an advanced technology environment.
Prerequisites: ACCT 3310 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 6410 Governmental And Not-For-profit Accounting
[3 credit hours]
Principles, procedures and ethics of financial reporting for not-for-profit organizations, including state and local government. Includes the use of funds, budgets, appropriations and encumbrances as a means of control.
Prerequisites: ACCT 3120 with a minimum grade of C or ACCT 5120 with a minimum grade of C
Term Offered: Spring, Fall

ACCT 6430 Business Valuation And Analysis
[3 credit hours]
Analyzes business analysis and valuation techniques with majpr emphasis placed on how a firm's financial reporting decisions affect fundamental analysis.
Prerequisites: ACCT 3120 with a minimum grade of C or ACCT 5120 with a minimum grade of C
Term Offered: Spring, Fall

ACCT 6440 Advanced Auditing
[3 credit hours]
Advanced Auditing aims to extend students' knowledge on auditing learned from lower level auditing course(s). The course introduces students to topics such as financial statement audit, audit planning, analytical procedures, professional judgment framework, financial statement fraud, professional ethics, and so on. In addition, cases, practitioners' and academic journal articles assigned during the semester enhance students' understanding and application of concepts learned. Finally, students can develop necessary audit skills through involving in doing Real Audit simulation.
Prerequisites: ACCT 4420 with a minimum grade of C or ACCT 5420 with a minimum grade of C
Term Offered: Spring, Fall

ACCT 6450 Fraud and Forensic Accounting
[3 credit hours]
This course is designed to introduce the student to the basic concepts of Fraud Examination and Forensic Accounting.
Prerequisites: ACCT 4420 with a minimum grade of C or ACCT 5420 with a minimum grade of C
Term Offered: Spring, Summer

ACCT 6510 Auditing Concepts and Applications
[3 credit hours]
An in-depth study of professional auditing standards and application to audit engagements. Emphasis will be placed on system analysis, the relationship of internal control to audit objectives, and the purpose of selected audit procedures. Cases and simulations will be used where applicable.
Prerequisites: ACCT 4420 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 6520 Regulation Capstone Taxation and Business Law Studies
[3 credit hours]
An in-depth study of regulation in the accounting discipline. Emphasis will be placed on individual, partnership, and corporate taxation, along with business law and the professional responsibilities of Certified Public Accountants. Writing assignments and simulations will be used where applicable.
Prerequisites: ACCT 6250 with a minimum grade of C and ACCT 4250 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 6530 Comprehensive Financial Accounting and Reporting
[3 credit hours]
An in-depth study of financial accounting for public, government, and not-for profit entities. Emphasis will be placed on the preparation, interpretation and evaluation of financial statements. Writing assignments and case studies in the form of simulations will be used where applicable.
Prerequisites: ACCT 3120 with a minimum grade of C or ACCT 5120 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 6540 An Accounting Perspective of the Business Environment
[3 credit hours]
An in-depth study of the general business environment. Emphasis will be placed on corporate governance, financial management, accounting, information systems, economic concepts and theory, and professional communication. Writing assignments and simulations will be used where applicable.
Prerequisites: ACCT 6130 with a minimum grade of C
Term Offered: Spring, Summer, Fall

ACCT 6600 Data Analytics for Accountants
[3 credit hours]
This course will cover the analysis of data as it pertains to accounting professionals. This will include analytic techniques for decision making and the examination of "big data" involving accounting information. Hands-on experiences will develop skills with a variety of software tools used in data analytics by accounting professionals.
Term Offered: Spring, Fall

ACCT 6960 Independent Study In Accounting
[1-3 credit hours]
Independent research report on an accounting topic of interest to both the student and the faculty member. Research related to a topic not covered in the listed graduate accounting courses.
Term Offered: Spring, Summer, Fall

Anatomy and Neurosciences (ANAT)

ANAT 5000 Anatomy
[1-9 credit hours]
Provides students with a working knowledge of the major anatomical regions and structures. Emphasis placed on the relationships of components as well as topographical and functional anatomy. Case studies will be utilized.
Term Offered: Fall

ANAT 6790 Microanatomy for Pathology Assistants
[4 credit hours]
Microanatomy for Pathology Assistants is a course that includes the study of the structure and function of cells, tissues, and organs. Particular emphasis is placed on histology at the light microscopic level. The course uses hundreds of high-resolution photographs and images of human and domestic animal tissues. Histology laboratories involve finding and identifying histological structures at low, medium, high, and oil immersion views. Clinical exercises will be used to develop "problem solving" and "critical thinking" skills.
Term Offered: Fall

ANAT 8330 Advanced Topographic Anatomy
[3 credit hours]
Detailed dissections of specific body regions. May be repeated for credit.
Term Offered: Fall

Anthropology (ANTH)

ANTH 5300 Cultural Resource Management - WAC
[3 credit hours]
Course explores the history, theory, and contemporary issues behind the historic preservation movement and emergence of Cultural Resource Management in the United States; topics engaged include legislation, federal and state programs, the national register, regional planning, and research orientations.
Term Offered: Spring, Summer, Fall

ANTH 5440 People, Population, and Society: Demographic Analysis
[3 credit hours]
Methods of population analysis, including examination and evaluation of data sources.
Term Offered: Spring, Summer

ANTH 5450 Exploring the City
[3 credit hours]
This course takes an interdisciplinary approach to life in cities around the world, with emphasis on the ethnographic exploration of how power, cultural difference, and social inequality in cities are produced and experienced.
Term Offered: Spring, Fall

ANTH 5530 Qualitative Approaches in Social Science Research
[3 credit hours]
This course examines qualitative methods used in social science research. Focusing on ethnographic and qualitative methods, the course provides students the skills necessary to design and conduct qualitative research studies.
Term Offered: Spring, Fall

ANTH 5740 Nutritional Anthropology
[3 credit hours]
An examination of the historical, social, political and economic factors that influence the production, distribution and consumption of food and the effects on world health and development.
Term Offered: Spring, Fall

ANTH 5760 Medical Anthropology
[3 credit hours]
An examination of the biocultural nature of health and illness.
Term Offered: Spring, Fall

ANTH 5980 Problems In Anthropology
[3 credit hours]
Courses on varied anthropological specialties. May be repeated in different specialty areas such as religion, ethnohistory, ethnic conflict and area courses.
Term Offered: Spring, Summer, Fall

ANTH 6990 Independent Research In Anthropology
[1-3 credit hours]
Supervised independent research in anthropology.
Term Offered: Spring, Fall

Art Education (AED)

AED 5000 Research In Art Education
[4 credit hours]
This course will provide an overview of empirical and historical research structures, application of research to classroom activities and development of research for publication.
Term Offered: Spring, Fall

AED 5140 Art Education For The Special Child
[3 credit hours]
This course introduces and surveys a wide variety of art strategies and instructional adaptations for use with the child with physical, emotional or mental differences.
Term Offered: Spring, Fall

AED 5300 Media And Methods In Therapeutic Art
[3 credit hours]
An investigation into group and individual processes as they relate to art media and methods in therapeutic art will be presented. Experiences in art media will be explored.
Prerequisites: AED 5220 with a minimum grade of D-
Term Offered: Spring

AED 5930 Advanced Seminar In Philosophy Of Art Education
[1-4 credit hours]
Guest lecturers from other institutions of higher learning are invited to The Toledo Museum of Art or The University of Toledo Department of Art to present seminars relevant to their endeavors.
Term Offered: Spring, Summer, Fall

AED 5990 Individual Study Of Art For The Graduate Student
[1-4 credit hours]
Individual study is designed to provide a student with the opportunity to work independently on professional problems under the direction of the faculty in the Department of Art.
Term Offered: Spring, Summer, Fall

AED 6920 Masters Research Project In Art Education
[1-4 credit hours]
This course is open to graduate students who elect the completion of a master's project in fulfilling the research requirement of the master's degree program.

AED 6940 Internship
[1-4 credit hours]
This course will incorporate advanced recreational therapy program concepts in therapeutic art within an internship environment using expressive techniques.
Term Offered: Spring, Fall

AED 6960 Master's Research Thesis In Art Education
[1-4 credit hours]
This course is open to graduate students who elect the completion of a master's thesis in fulfilling the research requirement of the master's degree program.
Term Offered: Summer

Bioengineering (BIOE)

BIOE 5200 Physiology And Anatomy For Bioengineers
[3 credit hours]
Review and study of general physiological principles and bioengineering perspectives of the human circulatory, respiratory, digestive, immune, nervous, muscular and excretory systems.
Term Offered: Spring, Fall

BIOE 5260 Medical Imaging Systems I
[3 credit hours]
An introduction to the physical principles, design and function of x-ray based diagnostic imaging systems, including radiographic, fluoroscopic and computer tomography (CT) systems.
Prerequisites: MIME 6000 with a minimum grade of C or MIME 8000 with a minimum grade of C
Term Offered: Spring, Fall

BIOE 5620 Cellular Electrophysiology
[3 credit hours]
The generation of electrical impulses by ion channels in excitable tissues. Models of ion channel gating include the Hodgkin-Huxley equations and Markov models. Principles of electrodiffusion applied to ionic flow through open channels.
Term Offered: Spring

BIOE 5650 Bioseparations
[3 credit hours]
Introduction to, analysis and industrial design of processes required to separate and purify proteins and other biological compounds for the downstream processing of bioreactor products. The separations techniques will include filtration, chromatography and crystallization.
Prerequisites: BIOE 3400 with a minimum grade of D- or CHEE 3120 with a minimum grade of D-
Term Offered: Fall

BIOE 5710 Biomechanics of Soft and Hard Materials
[3 credit hours]
Composite and hierarchical models of bone remodeling models presented. Soft tissue models include linear and nonlinear viscoelasticity, Fung's quasilinear viscoelastic theory. Biphasic and triphasic models and mechano-ionic interactions.
Term Offered: Fall

BIOE 5730 Computational Bioengineering
[3 credit hours]
Introduction to and utilization of computational packages for bioengineering applications. Introduction to finite element analysis and applications in biochemical, biofluidics, bioheat transfer, optimization.
Prerequisites: (BIOE 3110 with a minimum grade of D- and BIOE 1200 with a minimum grade of D-)
Term Offered: Spring, Fall

BIOE 5740 Tissue Engineering
[3 credit hours]
Application of principles from engineering and the life sciences toward the development of biological substitutes that restore, maintain or improve tissue function.
Prerequisites: (BIOE 2200 with a minimum grade of D- and BIOE 4100 with a minimum grade of D-)
Term Offered: Spring, Summer, Fall

BIOE 5750 Experimental Methods In Orthopedic Biomechanics
[3 credit hours]
The theory and implementation of techniques used for the measurement of forces and motion within the musculoskeletal system at the system, organ and tissue levels.
Prerequisites: BIOE 3110 with a minimum grade of D- or CIVE 1160 with a minimum grade of D-
Term Offered: Spring, Fall

BIOE 5780 Advanced Biomechanics
[3 credit hours]
Three-diminsional analysis and measurement of human body motions. Applications to gait analysis, physical therapies, and impact analysis. Includes total hip and knee replacement: elbow, shoulder, wrist and finger arthrophasty: bone plates, hip fracture fixation devices, and external fixators.
Term Offered: Spring, Fall

BIOE 5830 Additive Manufacturing
[3 credit hours]
Additive manufacturing (AM) is a method of manufacturing that has been growing rapidly. In this course the students will learn about various AM technologies. They will also work with the required design software packages to create 3D models and 3D-print objects from the designed models.
Prerequisites: MIME 2650 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

BIOE 5930 Bioengineering Seminar
[0 credit hours]
Presentations of ongoing research in the field of bioengineering. Includes presentations by guest speakers, faculty and graduate students.
Term Offered: Spring, Fall

BIOE 5980 Special Topics In Bioengineering
[1-5 credit hours]
Selected subjects in the field of bioengineering with intensive investigation of the recent literature in a few areas of special interest to the class and the professor.
Term Offered: Spring, Summer, Fall

BIOE 5990 Independent Study In Bioengineering
[1-6 credit hours]
The student, under the guidance of their research adviser, explores in-depth specific areas or topics related to their thesis or dissertation research.
Term Offered: Spring, Summer, Fall

BIOE 6100 Computational Physiology
[3 credit hours]
Application of mathematical and computational techniques to physiological systems. Models include conductive cables and compartmental models of nerve fibers, nonlinear differential equation models of electrophysiology, and stochastic models of biomolecular interactions.
Prerequisites: (MIME 6000 with a minimum grade of C or MIME 8000 with a minimum grade of C) and (BIOE 4100 with a minimum grade of C or BIOE 5200 with a minimum grade of C)
Term Offered: Spring

BIOE 6310 Cell and Tissue Engineering Laboratory
[3 credit hours]
The application of engineering principles to the design and analysis of biological processes that employ living organisms or biochemicals.
Term Offered: Spring

BIOE 6520 Orthopaedic Biomechanics
[3 credit hours]
The course of orthopaedic biomechanics has been designed to fuse the biological and physiological problems with the science and technology of engineering. It focuses on a brief review of the physiology and biology of the human body, introduces the physics of manual industrial activities.
Prerequisites: BIOE 4110 with a minimum grade of D- and BIOE 5780 with a minimum grade of D-
Term Offered: Spring

BIOE 6920 Bioengineering Project
[1-6 credit hours]
The student performs a special project of an advanced nature in bioengineering. The course is primarily intended for students pursuing a Masters degree with the project option in Bioengineering.
Term Offered: Spring, Summer, Fall

BIOE 6960 Bioengineering Research And Thesis - Master's
[1-9 credit hours]
Graduate thesis research. The student completes and defends a written thesis under the direction and guidance of their faculty research adviser.
Term Offered: Spring, Summer, Fall

BIOE 6970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the master's/doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

BIOE 7260 Medical Imaging Systems I
[3 credit hours]
An introduction to the physical principles, design and function of x-ray based diagnostic imaging systems, including radiographic, fluoroscopic and computer tomography (CT) systems.
Prerequisites: MIME 6000 with a minimum grade of C or MIME 8000 with a minimum grade of C
Term Offered: Spring, Fall

BIOE 7930 Bioengineering Seminar
[0 credit hours]
Presentations of ongoing research in the field of bioengineering. Includes presentations by guest speakers, faculty and graduate students.
Term Offered: Spring, Fall

BIOE 7980 Special Topics In Bioengineering
[1-5 credit hours]
Selected subjects in the field of bioengineering with intensive investigation of the recent literature in a few areas of special interest to the class and the professor.
Term Offered: Summer

BIOE 7990 Independent Study In Bioengineering
[1-6 credit hours]
The student, under the guidance of their research adviser, explores in-depth specific areas or topics related to their thesis or dissertation research.
Term Offered: Spring, Summer, Fall

BIOE 8100 Computational Physiology
[3 credit hours]
Application of mathematical and computational techniques to physiological systems. Models include conductive cables and compartmental models of nerve fibers, nonlinear differential equation models of electrophysiology, and stochastic models of biomolecular interactions.
Prerequisites: (MIME 6000 with a minimum grade of C or MIME 8000 with a minimum grade of C) and (BIOE 4100 with a minimum grade of C or BIOE 5200 with a minimum grade of C)
Term Offered: Spring

BIOE 8310 Cell and Tissue Engineering Laboratory
[3 credit hours]
The application of engineering principles to the design and analysis of biological processes that employ living organisms or biochemicals.
Term Offered: Spring

BIOE 8520 Orthopaedic Biomechanics
[3 credit hours]
The course of orthopaedic biomechanics has been designed to fuse the biological and physiological problems with the science and technology of engineering. It focuses on a brief review of the physiology and biology of the human body, introduces the physics of manual industrial activities.
Prerequisites: BIOE 4110 with a minimum grade of D- and BIOE 5780 with a minimum grade of D-
Term Offered: Spring

BIOE 8960 Bioengineering Dissertation
[1-9 credit hours]
Original investigations of significant bioengineering problems at the graduate level under the guidance of a member of the faculty.
Term Offered: Spring, Summer, Fall

BIOE 8970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the master's/doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

Bioinform and Proteom-Genomics (BIPG)

BIPG 5100 Fund Bioinformatics Proteomics
[3 credit hours]
Introduction to bioinformatics and computational biology. Both theory and practical methods for evaluating and managing biomedical data will be covered. Topics range from sequence analysis to structure prediction. Includes computer laboratory sessions. May be taken concurrently with BIPG520/720.
Term Offered: Fall

BIPG 5110 Practical Bioinformatics
[1 credit hour]
This course will provide students with practical experience with the most common bioinformatics tasks. Short lectures will be integrated with computer exercises in the Bioinformatics Computer Lab.
Term Offered: Summer

BIPG 5120 Clinical Bioinformatics
[3 credit hours]
This course introduces graduate students and healthcare professionals to the science of Clinical Bioinformatics and application in healthcare setting. We aim to provide students a basic understanding of the health informatics and bioinformatics methodologies and practices, along with the omics technologies used for clinical diagnostic and treatment purposes. The emphasis of this course is on the clinical rather than research applications of these technologies and methodologies. We will illustrate how the discipline of Clinical Bioinformatics provides an important bridge between the cutting-edge science and the delivery of personalized/precision medicine in clinical practice. By understanding the role of a Clinical Bioinformatician it will become clear how integral they are to ensuring the beneficial opportunities of genomic medicine are fully realized in patient care.
Term Offered: Spring, Summer, Fall

BIPG 5200 Statistical Methods in Bioinformatics
[3 credit hours]
This course introduces students to statistical methods commonly used in bioinformatics. Students will learn to use statistical programs and related bioinformatics resources locally and on the Internet. Lectures and lab discussion will emphasize on the statistical models and methods underlying the computational tools. The course briefly reviews basic statistical methods and methods more specific to bioinformatics research, including Markov chains, hidden Markov models, Bayesian statistics, and Bayesian networks. Students will learn the principles behind these statistical methods and how they can be applied to analyze throughput data.
Term Offered: Fall

BIPG 5300 Current Topics in BPG
[1 credit hour]
In-depth analysis of original scientific papers/seminars in the fields of bioinformatics, proteomics and genomics for the development of critical analysis and scientific communication skills. May be repeated for credit.
Term Offered: Spring, Summer, Fall

BIPG 5400 Biodatabases
[1 credit hour]
This course will introduce students to database concepts, design, and implementation, using the most popular database formats utilized in biomedical research. The practicum provides hands-on experience with real-world databases.
Term Offered: Summer

BIPG 5500 Mining Omics Data
[1 credit hour]
This course aims at providing hands-on training on mining bioinformatics databases. Students will learn how to handle and analyze transcriptomic and other relevant data. Topics covered include preprocessing, identifying differentially expressed genes, classification and presentation of findings.
Term Offered: Summer

BIPG 5800 Rotations in BPG
[0-4 credit hours]
Students will participate in selected on-going research programs with faculty members in the Bioinformatics, Proteomics and Genomics program. May be repeated for credit.
Term Offered: Fall

BIPG 6100 Bioinformatic Computation
[3 credit hours]
Use, design, strengths and limitations of bioinformatics programs run on desktop computers. Programming in PERL to acquire and analyze biological sequences. Construction and management of databases. Introduction of LINUX, C++, and Java. Includes computer laboratory sessions.
Term Offered: Spring, Summer

BIPG 6110 Case Studies in Omics Medicine
[1 credit hour]
The rapid advancement in 'omics' technologies are presently adding new components to the advancement of precision medicine and clinical care. The understanding of strengths and limitation of Omics technologies is fundamental for the selection of appropriate type for specific clinical scenario. This course presents case-report involving the application of omics technology for the prevention, diagnosis, and treatment of disease. Students will be introduced to omics research and technology in genomics, epigenomics, transcriptomics, proteomics, and metabolomics. Students will learn about selected Omics technologies and their strengths and limitations. Students will also learn underlying principles of these technologies and how to critically judge the robustness of the Omics data.
Term Offered: Spring, Summer, Fall

BIPG 6200 Advanced Programming in Bioinformatics
[3 credit hours]
This course introduces students to programming methods commonly used in bioinformatics. The course consists of two parts. The first part focuses on Python programming and the second part focuses on R programming. The Python part of the course provides a general overview of the Python programming. Students will learn and practice programming concepts using the Python programming language. Focus lies on how to think computationally and students will learn and practice to write programs to tackle problems in bioinformatics. The course will also contain a section on how to use code written by other programmers in your own Python programs. The R part of the course provides the programming tools needed for data analysis in bioinformatics. The student will learn how to access and summarize big dataset using the R program. Each section will be driven by a particular problem in bioinformatics and students will gain experience in R programming addressing bioinformatics problems.
Prerequisites: BIPG 6100 with a minimum grade of C
Term Offered: Fall

BIPG 6300 Clinical Proteomics
[2 credit hours]
This course teaches advanced proteomics techniques of disease, pathways, targets and drug effects, such as advanced proteomics experimental and computational techniques to support clinical research needs. Protein structure and classification, including their functional role and protein-protein interaction will be presented. Protein identification by mass spectrometry and bioinformatics analysis will be taught to help in drug discovery and translating bench to bedside, building on basic scientific research to create new therapies, medical procedures, or diagnostics.
Term Offered: Fall

BIPG 6400 Applications of Bioinformatics
[3 credit hours]
Lectures and hands-on activities that demonstrate the application of bioinformatics, proteomic and genomics techniques to solve research problems being studied by selected faculty from MCO, UT, BGSU or another institution.
Term Offered: Spring

BIPG 6500 Applied Statistics for Bioinformatics
[3 credit hours]
This course will provide students with practical statistical and data analysis skills to perform rigorous analysis of high-throughput biological data. The course assumes familiarity with the statistical methods and with R programming. The course covers the statistical concepts necessary to design experiments and analyze high-dimensional data generated by high-throughput technologies. Also included are stochastic modeling and statistical methods applied to problems such as mapping disease-associated genes, SNP and mutation analysis, transcriptomics, miRNA, DNA methylation and epigenetics, proteomics, metabolomics, and metagenomics.
Term Offered: Spring, Fall

BIPG 6600 BIPG Internship
[1-6 credit hours]
Focused practical training in Biomarker discovery and validation with a pharmaceutical-oriented company. Builds upon didactic course work.

BIPG 6700 Research in Bioformatics
[1-6 credit hours]
Supervised research in bioinformatics, especially designed for new graduate students to gain research credits before taking their Qualifying Exam. Students will study bioinformatics applications to biochemical research, usually in a laboratory setting, as well as discussing current literature and advanced techniques in all areas of bioinformatics.

BIPG 6800 Practical Genomics
[3 credit hours]
This course provides a broad overview of the field of bioinformatics, algorithmic solutions for biological data analysis, and applications in genomics. The course is addressed to students in computational and interdisciplinary programs, such as Biomedical Informatics, Biostatistics, Computer Science and Engineering, Biomedical Engineering, as well as Systems Biology & Physiology, Cancer Biology, and related programs. Other students interested in learning about computational methods in biomedical research are also encouraged to take this course.
Term Offered: Spring

BIPG 6890 Independent Study in BPG
[0-4 credit hours]
Intense study in an area of bioinformatics, proteomics and genomics (BPG). Course content, assignments, meeting times and grade requirements are arranged with a BPG faculty member. May be repeated for credit.
Term Offered: Spring, Summer, Fall

BIPG 6990 Thesis in Bioinformatics
[1-15 credit hours]
Research in bioinformatics, or interdisciplinary investigation of biomedical problems with significant bioinformatic components. This research is at the masters level, leading to completion of a scientific project for presentation as a thesis. May be repeated for credit.
Term Offered: Spring, Summer, Fall

BIPG 7100 Fund Bioinform and Proteomics
[3 credit hours]
Introduction to bioinformatics and computational biology. Both theory and practical methods for evaluating and managing biomedical data will be covered. Topics range from sequence analysis to structure prediction. Includes computer laboratory sessions. May be taken concurrently with BIPG520/720.
Term Offered: Fall

BIPG 7110 Practical Bioinformatics
[1 credit hour]
Short lectures integrated with computer tasks in Bioinformatics Computer Lab. The bioinformatics resources will primarily be those freely available on the internet. The course will meet twice a week for 2-hour sessions in the Bioinformatics Computer Lab. The course will last four weeks during the Summer semester. The following topics will be presented in the eight sessions: searching biological databases, pair-wise sequence alignments, BLAST searches, multiple sequence alignment, phylogenetic analysis, gene prediction, and transcription factor binding sites and other DNA motifs. No prerequisites.
Term Offered: Summer

BIPG 7120 Clinical Bioinformatics
[3 credit hours]
This course introduces graduate students and healthcare professionals to the science of Clinical Bioinformatics and application in healthcare setting. We aim to provide students a basic understanding of the health informatics and bioinformatics methodologies and practices, along with the omics technologies used for clinical diagnostic and treatment purposes. The emphasis of this course is on the clinical rather than research applications of these technologies and methodologies. We will illustrate how the discipline of Clinical Bioinformatics provides an important bridge between the cutting-edge science and the delivery of personalized/precision medicine in clinical practice. By understanding the role of a Clinical Bioinformatician it will become clear how integral they are to ensuring the beneficial opportunities of genomic medicine are fully realized in patient care.
Term Offered: Spring, Summer, Fall

BIPG 7300 Transcriptomic Data Science
[3 credit hours]
Transcriptomic though part of genomics has evolved tremendously over the past 10 years and has expanded to many other domains including drug discovery and cellular anatomy. This course introduces students to the basic biology of modern transcriptomics and the experimental tools that we use to measure it. Starting with the Central Dogma of Molecular Biology I will cover how next-generation sequencing can be used to measure RNA expression and its regulation. Recent advances in transcriptomic data science including single cell RNA sequencing, RNA-editing, and transcriptomic signature-based drug discovery approaches will also be covered. Students will also get an introduction to the key concepts in cluster computing and data science that you'll need to understand how data from next-generation sequencing experiments are generated and analyzed. The course is designed based on the need of transcriptomic data science and cluster computing in job market. Accordingly, the major focus will be on project-based teaching.
Term Offered: Spring, Summer

BIPG 7350 Algorithms for Bioinformatics
[3 credit hours]
The course introduces students to design and use of major algorithm classes that are often used in bioinformatic analyses. These include, but are not limited to, exhaustive search, greedy algorithms, dynamic programming, divide#and#conquer, and graph#based formulations. Lectures, and individual and group-based projects are used.
Term Offered: Spring

BIPG 7400 Biodatabases
[1 credit hour]
This course will introduce students to database concepts, design, and implementation, using the most popular database formats utilized in biomedical research. The practicum provides hands-on experience with real-world databases.
Term Offered: Summer

BIPG 7500 Microarray Analysis
[1 credit hour]

BIPG 8100 Bioinformatic Computation
[3 credit hours]
Use, design, strengths and limitations of bioinformatics programs run on desktop computers. Programming in PERL to acquire and analyze biological sequences. Construction and management of databases. Introduction of LINUX, C++, and Java. Includes computer laboratory sessions.
Term Offered: Spring

BIPG 8400 Applications of Bioinformatics
[3 credit hours]

BIPG 8890 Independent Study in BPG
[0-4 credit hours]
Intense study in an area of bioinformatics, proteomics and genomics (BPG). Course content, assignments, meeting times and grade requirements are arranged with a BPG faculty member. May be repeated for credit.

BIPG 9990 Dissertation Research in BIPG
[1-9 credit hours]
Formal intensive study of specific topic in bioinformatics, or bioinformatic applications in other biomedical fields. This research should be conducted after the doctoral student passes their qualifying exam. Individual studies may include the application of both experimental and theoretical scientific methods, with the goal of advancing bioinformatic methods and/or of advancing biomedical fields through the use of such methods. May be repeated for credit.
Term Offered: Spring, Summer, Fall

Biology (BIOL)

BIOL 5030 Advanced Microbiology
[3 credit hours]
Lectures on the principles of modern microbiology and virology, including metabolism, growth, cellular morphology, genetics and host parasite relationships. Bacterial and viral diseases will be illustrated.
Term Offered: Spring

BIOL 5040 Advanced Microbiology Laboratory
[1 credit hour]
Laboratories utilizing basic microbiological techniques and illustrating principles of growth, identification and genetics of microbes.
Corequisites: BIOL 5030
Term Offered: Spring

BIOL 5050 Advanced Immunology
[3 credit hours]
The development, genetics and physiology of the immune response.
Term Offered: Spring, Fall

BIOL 5230 Advanced Comparative Animal Physiology
[3 credit hours]
Lectures on the comparative and environmental physiology of vertebrates and invertebrates including metabolism, temperature regulation, respiration, circulation excretion and osmotic regulation.
Prerequisites: BIOL 3030 with a minimum grade of D- and BIOL 3070 with a minimum grade of D-
Term Offered: Spring, Summer

BIOL 6000 Introduction To Scientific Thought And Expression
[1,3 credit hours]
A writing intensive course for new graduate students that focuses on scientific hypothesis testing and reading the original literature in biology.
Term Offered: Spring, Fall

BIOL 6010 Advanced Molecular Biology
[3 credit hours]
Analysis of recent developments in prokaryotic and eukaryotic molecular biology through evaluation and discussion of current literature.
Term Offered: Fall

BIOL 6020 Advanced Molecular Biology Laboratory
[2 credit hours]
Students will gain a working knowledge of essential laboratory techniques used in molecular biology. These techniques, including polymerase chain reaction (PCR), electrophoresis, DNA cloning, microscopy and transfection, will be used in a course project to express and analyze a protein of interest in cultured mammalian cells. The concepts underlying these procedures will be studied online before the lab. This course is designed to prepare students for careers in research, biotechnology and science education.
Term Offered: Summer

BIOL 6030 Introduction to Graduate Studies
[2 credit hours]
This course is designed to provide new UToledo graduate students with essential information and tips to help them achieve their academic goals at the University of Toledo. Students will be given an overview of the various research options they have in the UToledo Department of Biological Sciences. Students will be given some basic training in statistical methods typically used in the biological sciences. Students will receive training in responsible conduct so they may perform research to a high ethical standard. This course will provide a foundation for students to properly conduct research and supply them with the information and resources for them to be successful in graduate school.
Term Offered: Fall

BIOL 6040 Introduction to Graduate Cell and Molecular Biology and Methods
[3 credit hours]
The main goals of this course are to provide basic knowledge of methods used in research laboratories to study molecular and cellular processes and to provide basic knowledge of those processes. This information is to provide the fundamental background knowledge necessary basis for our graduate students to succeed in our graduate program. Specific topics include cell culture, nucleic acid manipulation, electrophoresis, structure of nucleic acids and proteins, basic concepts of transcription and translation, cell membranes, protein sorting, the cytoskeleton, regulation of cell death and cancer.
Term Offered: Fall

BIOL 6090 Advanced Cell Biology
[3 credit hours]
An advanced course that stresses the experimental basis for current concepts of cell structure and function.
Term Offered: Spring

BIOL 6100 Research Methodology: Cell And Molecular Biology
[3 credit hours]
An in-depth discussion of techniques used in the study of cell and molecular biology. Examples include chromatography and fractionation, electrophoresis cell and molecular cloning.
Term Offered: Fall

BIOL 6200 Advanced Signal Transduction
[3 credit hours]
This course will provide an in-depth discussion of signal transduction topics important for cell/molecular biology research, emphasizing the interplay between intracellular signaling molecules needed to regulate physiological responses.
Prerequisites: BIOL 6010 with a minimum grade of D-
Term Offered: Spring

BIOL 6300 Advanced Microscopy and Imaging
[3 credit hours]
This course focuses on advanced quantitative fluorescence imaging methods used to visualize single molecules, organelles, cells and tissues in vitro and in vivo. Students will gain theoretical understanding of fluorescence-based imaging techniques such as confocal, TIRF, and super-resolution microscopy, and hands-on experience on the fundamentals of image analysis and quantification.
Prerequisites: BIOL 6090 with a minimum grade of D- and BIOL 6100 with a minimum grade of D-
Term Offered: Spring, Fall

BIOL 6830 Molecular and Cellular Biology
[4 credit hours]
Essential concepts of molecular genetics and cell biology. Major topics include gene structure and composition, transcription, translation, protein structure and function, cell cycle, cell movement, and cell signaling. Primarily intended for Master students enrolled in a non-laboratory research based degree program. Students who have received credit for either BIOL 6010 or BIOL 6090 cannot receive credit for BIOL 6830.
Term Offered: Summer

BIOL 6920 Special Projects In Biology
[2-4 credit hours]
Introduction to research on a selected problem under the direction of an individual faculty member.
Term Offered: Spring, Summer, Fall

BIOL 6930 Seminar In Biology
[1 credit hour]
Presentation on research or current literature by graduate students, faculty, or guest speakers.
Term Offered: Spring, Fall

BIOL 6960 Masters Thesis Research
[1-15 credit hours]
Research that normally contributes to the fulfillment of the M.S. thesis requirement.
Term Offered: Spring, Summer, Fall

BIOL 6980 Advanced Topics In Biology
[2-4 credit hours]
Seminar/discussion of significant current topics or problems in biology.
Term Offered: Spring

BIOL 6990 Advanced Readings In Biology
[2-4 credit hours]
Faculty directed readings or projects in a specific area of Biology.
Term Offered: Spring, Summer, Fall

BIOL 7030 Advanced Microbiology
[3 credit hours]
Lectures on the principles of modern microbiology and virology, including metabolism, growth, cellular morphology, genetics and host parasite relationships. Bacterial and viral diseases will be illustrated.
Term Offered: Spring

BIOL 7040 Advanced Microbiology Laboratory
[1 credit hour]
Laboratories utilizing basic microbiological techniques and illustrating principles of growth, identification and genetics of microbes.
Corequisites: BIOL 7030
Term Offered: Spring

BIOL 7050 Advanced Immunology
[3 credit hours]
The development, genetics and physiology of the immune response.
Term Offered: Spring, Fall

BIOL 8000 Introduction To Scientific Thought And Expression
[1,3 credit hours]
A writing intensive course for new graduate students that focuses on scientific hypothesis testing and reading the original literature in biology.
Term Offered: Spring, Fall

BIOL 8010 Advanced Molecular Biology
[3 credit hours]
Analysis of recent developments in prokaryotic and eukaryotic molecular biology through evaluation and discussion of current literature.
Term Offered: Fall

BIOL 8030 Introduction to Graduate Studies
[2 credit hours]
This course is designed to provide new UToledo graduate students with essential information and tips to help them achieve their academic goals at the University of Toledo. Students will be given an overview of the various research options they have in the UToledo Department of Biological Sciences. Students will be given some basic training in statistical methods typically used in the biological sciences. Students will receive training in responsible conduct so they may perform research to a high ethical standard. This course will provide a foundation for students to properly conduct research and supply them with the information and resources for them to be successful in graduate school.
Term Offered: Fall

BIOL 8040 Introduction to Graduate Cell and Molecular Biology and Methods
[3 credit hours]
The main goals of this course are to provide basic knowledge of methods used in research laboratories to study molecular and cellular processes and to provide basic knowledge of those processes. This information is to provide the fundamental background knowledge necessary basis for our graduate students to succeed in our graduate program. Specific topics include cell culture, nucleic acid manipulation, electrophoresis, structure of nucleic acids and proteins, basic concepts of transcription and translation, cell membranes, protein sorting, the cytoskeleton, regulation of cell death and cancer.
Term Offered: Fall

BIOL 8090 Advanced Cell Biology
[3 credit hours]
An advanced course that stresses the experimental basis for current concepts of cell structure and function.
Term Offered: Spring

BIOL 8100 Research Methodology: Cell And Molecular Biology
[3 credit hours]
An in-depth discussion of techniques used in the study of cell and molecular biology. Examples include chromatography and fractionation, electrophoresis cell and molecular cloning.
Term Offered: Fall

BIOL 8200 Advanced Signal Transduction
[3 credit hours]
This course will provide an in-depth discussion of signal transduction topics important for cell/molecular biology research, emphasizing the interplay between intracellular signaling molecules needed to regulate physiological responses.
Prerequisites: BIOL 8010 with a minimum grade of D-
Term Offered: Spring

BIOL 8300 Advanced Microscopy and Imaging
[3 credit hours]
This course focuses on advanced quantitative fluorescence imaging methods used to visualize single molecules, organelles, cells and tissues in vitro and in vivo. Students will gain theoretical understanding of fluorescence-based imaging techniques such as confocal, TIRF, and super-resolution microscopy, and hands-on experience on the fundamentals of image analysis and quantification.
Prerequisites: BIOL 8090 with a minimum grade of D- and BIOL 8100 with a minimum grade of D-
Term Offered: Fall

BIOL 8920 Special Projects In Biology
[2-4 credit hours]
Introduction to research on a selected problem under the direction of an individual faculty member.
Term Offered: Spring, Summer, Fall

BIOL 8930 Seminar In Biology
[1 credit hour]
Presentation on research or current literature by graduate students, faculty, or guest speakers.
Term Offered: Spring, Fall

BIOL 8960 Doctoral Dissertation Research
[1-15 credit hours]
Research normally leading to the fulfillment of the Ph.D. dissertation requirement.
Term Offered: Spring, Summer, Fall

BIOL 8990 Advanced Readings In Biology
[2-4 credit hours]
Faculty directed readings or projects in a specific area of Biology.
Term Offered: Spring, Summer, Fall

Biomarker Res Indiv Medicine (BRIM)

BRIM 6200 Biomarker Disc,Valid & Impleme
[3 credit hours]
Unit I of this survey course will explore the clinical need and methodologic approaches to biomarker development and validation. Unit 2 will consider biomarker use in individualized medicine.
Term Offered: Spring

BRIM 8200 Biomarker Disc Valid & Impleme
[3 credit hours]
Unit I of this survey course will explore the clinical need and methodologic approaches to biomarker development and validation. Unit 2 will consider biomarker use in individualized medicine.
Term Offered: Spring

Biomarkers and Diagnostics (BIDI)

BIDI 5000 Biostatistical Methods for Biomarkers
[3 credit hours]
This course will introduce students to biostastical concepts and methods for analyzing biomarker data. The course focuses on statistical methods for biomarkers to address various issues arising from studies assessing biomarkers in biomedical research and including associations with certain diseases or health conditions. The course presents both basic and advanced topics.

BIDI 5100 Biomarkers and Diagnostics Internship
[6 credit hours]
Supervised full time work experience in Biomarker dicovery and validation in a pharmaceutical oriented company. Builds upon didactic course work.
Term Offered: Summer

BIDI 5200 Readings in Biomarkers and Diagnostics
[1 credit hour]
Review of selected research topics related to Biomarkers and their application to diagnosis. Student discussion will be moderated through the Blackboard course management system by the course director.
Term Offered: Summer

Biomedical Engineering (BME)

BME 8900 Independent Research
[1-16 credit hours]
[1-16 hours] Selected topics from current BME research with investigation into recent literature and/or via a laboratory experience in an area of mutual interest to the student and the instructor. Students are to use the section number of their instructor. Prerequisite: Instructor consent.
Term Offered: Spring, Summer, Fall

BME 8960 Dissertation Research
[1-9 credit hours]
[1-16 hours] Doctoral dissertation research credit hours for students in the biomedical engineering program. Students are to use the section number of their dissertation adviser.
Term Offered: Spring, Summer, Fall

BME 8970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

BME 8980 Special Topics
[1-8 credit hours]
[1-8 hours] A special topic at the graduate level in biomedical engineering to be offered as a lecture course during a term by a BME faculty member. Prerequisite: Consent of the BME faculty member.
Term Offered: Spring, Summer, Fall

Biomedical Sciences Pgm (BMSP)

BMSP 5320 Statistical Methods I
[3 credit hours]
Introduction to statistical methods with emphasis on problems in the biomedical sciences. Included are descriptive statistics, probability theory, statistical inference, experimental design and simple statistical tests.
Term Offered: Summer

BMSP 6000 Entering Research
[1 credit hour]
This course is designed for novice graduate students to help them recognize the most critical training, relationships, and development in their graduate studies. Many of these students need to practice and implement the skills taught here throughout their graduate years. We are here to help facilitate student's career growth.
Term Offered: Fall

BMSP 6010 Strategic Approaches to Biomedical Research
[2 credit hours]
This course is designed to have doctoral students practice to become scientific leaders at an early stage of training. Scientific leaders constantly seek the most current knowledge in their research field to identify gaps in knowledge. They then generate a hypothesis to fill in knowledge gaps and Specific Aims to test the hypothesis. Scientific leaders communicate efficiently by giving presentations, publishing studies, writing proposals, and reviewing peers' work. In this course, students will develop skills to comprehend the current knowledge in a research area, identify the gap in knowledge, generate hypotheses and specific aims, and then design rigorous experimental approaches. Problem-based and active learning are used throughout this course to help students achieve higher order learning skills such as gathering data, and analyzing what is known, and then apply this knowledge to evaluate new concepts and create new research strategies.
Term Offered: Summer

BMSP 6340 Curr Prob Res App Genes/Genom
[2 credit hours]
This course provides an introduction to major areas of current research in genetics and molecular biology. Topics include gene structure and regulation, DNA replication, recombination, repair, mutation, and quantitative genetics.
Term Offered: Fall

BMSP 6350 Cell Biology & Signaling
[3 credit hours]
The content of this course will encompass didactic lectures on current knowledge and methodological approaches in the area of fundamental cellular processes and cell communication.
Term Offered: Spring

BMSP 6360 Current Problems and Research Approaches in Cell Membranes
[2 credit hours]
This course will explore vital roles played by plasma and intracellular membranes in communication and homeostasis, and by membrane lipid/protein interactions in defining cytoarchitecture, protein sorting, excitability and synaptic transmission.
Term Offered: Fall

BMSP 6370 Recent Advances in NND Journal
[1 credit hour]
Forum for the presentation,critique, and discussion of recent primary literature important to the development of the field of biomedical science.
Term Offered: Spring

BMSP 6380 Methods in Biomedical Sciences
[2 credit hours]
This course will cover the basic principles and applications, of state-of-the-art technology in molecular biology, protein chemistry, and studies with culture cells, tissue explants and transgenic animal models.
Term Offered: Fall

BMSP 6390 Mentored Research
[1-15 credit hours]
Students will be mentored in biomedical research and will gain familiarity with research projects ongoing in graduate laboratories. May be repeated for credit.
Term Offered: Spring, Summer, Fall

BMSP 6400 BPG Intro to Mthds in Bio Sci
[1 credit hour]
Introduction to biomedical methods. Required for Bioinformatics, Proteomics and Genomics (BPG) MSBS (but not certificate) students. An abbreviated version of BMSP 638, BMSP 640 runs for first 8 weeks of Fall semester.
Term Offered: Fall

BMSP 6470 System Pathophysiology
[4 credit hours]
This course provides an understanding of fundamental processes underlying pathophysiology, which occur at the cellular and organ level and lead to impairment of physiology processes. The course is organized into 6 blocks providing knowledge on the malfunctions of physiological systems, including cardiovascular, renal, skeletal, endocrinology, immunology, neural system, and cancer, and an introduction to pharmacology and applied bioinformatics.
Term Offered: Spring

BMSP 7320 Statistical Methods I
[3 credit hours]
Introduction to statistical methods with emphasis on problems in the biomedical sciences. Included are descriptive statistics, probability theory, statistical inference, experimental design and simple statistical tests.
Term Offered: Summer

BMSP 8240 Qualifying Exam to Fellowship
[1 credit hour]
This course is designed to guide predoctoral students through the process of converting their qualifying exam into a competitive fellowship application to NIH (F31), the American Heart Association, or other external funding agencies.
Term Offered: Spring

BMSP 8250 Grant Writing Workshop
[3 credit hours]
This standard letter-grade course is designed to guide predoctoral students through the process of converting their qualifying exam into a competitive fellowship application to the NIH (F31), the American Heart Association, or other external funding agency; submission of an application is required for course completion.
Term Offered: Spring

BMSP 8320 Systems Pathophysiology II
[2.5 credit hours]
The course will cover the fundamentals and current research efforts in biomedical sciences, emphasizing diseases of the cardiovascular, immune, and nervous systems, as well as metabolic and infectious diseases.
Term Offered: Spring

BMSP 8330 Curr Prob Res App Protein Str
[2.5 credit hours]
The course will cover principles of protein structure/function relationships in proteins, protein folding, ligand-protein interactions and mechanisms of enzyme-catalyzed reactions. Special emphasis will be given to the present-day research.
Term Offered: Fall

BMSP 8340 Curr Prob Res App Genes/Genome
[2 credit hours]
This course provides an introduction to major areas of current research in genetics and molecular biology. Topics include gene structure and regulation, DNA replication, recombination, repair, mutation, and quantitative genetics.
Term Offered: Fall

BMSP 8350 Cell Biology & Signaling
[3 credit hours]
The content of this course will encompass didactic lectures on current knowledge and methodological approaches in the area of fundamental cellular processes and cell communication.
Term Offered: Spring

BMSP 8360 Curr Prob Cell Membranes
[2.5 credit hours]
This course will explore vital roles played by plasma and intracellular membranes in communication and homeostasis, and by membrane lipid/protein interactions in defining cytoarchitecture, protein sorting, excitability and synaptic transmission.
Term Offered: Fall

BMSP 8380 Methods Biomedical Sciences
[2.5 credit hours]
This course will cover the basic principles and applications, of state-of-the-art technology in molecular biology, protein chemistry, and studies with culture cells, tissue explants and transgenic animal models.
Term Offered: Fall

BMSP 8390 Mentored Research
[1-15 credit hours]
Students will be mentored in biomedical research and will gain familiarity with research projects ongoing in graduate laboratories. May be repeated for credit.
Term Offered: Spring, Summer, Fall

BMSP 8470 System Pathophysiology
[4 credit hours]
This course provides an understanding of fundamental processes underlying pathophysiology, which occur at the cellular and organ level and lead to impairment of physiology processes. The course is organized into 6 blocks providing knowledge on the malfunctions of physiological systems, including cardiovascular, renal, skeletal, endocrinology, immunology, neural system, and cancer, and an introduction to pharmacology and applied bioinformatics.
Term Offered: Spring

Business Administration (BUAD)

BUAD 6100 Accounting For Decision Making
[3 credit hours]
This course develops an appreciation for financial statements and their usefulness in making decisions. The nature of costs, opportunity costs, responsibility accounting, budgeting, cost allocations, absorption cost systems, activity based costing and standard costs are included.
Prerequisites: ACTG 1040 with a minimum grade of C and ACTG 1050 with a minimum grade of C or BUAD 2040 with a minimum grade of C and BUAD 2050 with a minimum grade of C or ACCT 5000 with a minimum grade of C
Term Offered: Spring, Summer, Fall

BUAD 6200 Corporate Finance
[3 credit hours]
The course reviews the analytical tools needed to solve a wide range of financial management issues. It concentrates on three major types of decisions in corporate finance: investment decisions, financing decisions, and payout decisions. Specific topics include stock and bond pricing, risk and returns, capital budgeting, leverage and capital structure choice, and dividend policy.
Prerequisites: FINA 5310 with a minimum grade of C or BUAD 3040 with a minimum grade of C
Term Offered: Spring, Summer, Fall

BUAD 6300 Strategic Marketing And Analysis
[3 credit hours]
This course examines the fundamentals of marketing analysis and strategy. The purpose is to strengthen your basic understanding of marketing strategy and the management philosophy of being market-driven. Being market-driven means the organization's decision-making is driven by customer information, market knowledge, competitive intelligence, an understanding of how the organization creates and delivers value, and a clear set of strategies that differentiate the organization and give it a competitive advantage.
Term Offered: Spring, Summer, Fall

BUAD 6400 Results-Based Management
[3 credit hours]
This course is dedicated to understanding human behavior in organizational settings and how organizations can impact and support results-based management. The intent of this course is to provide an understanding of alternative managerial approaches to particular issues, and to introduce ways to analyze the various organizational and social costs and benefits typically associated with any given approach. Case analyses and team projects are core elements of this course.
Term Offered: Spring, Summer, Fall

BUAD 6500 International Business
[3 credit hours]
This course focuses on an understanding of the process and controversies underlying globalization, as well as its supporting theories and strategic challenges encountered when firms "go global" or operate in the global context.
Term Offered: Spring, Summer, Fall

BUAD 6600 Supply Chain Management
[3 credit hours]
This course presents an integrated approach to value chain management and analyzes key challenges, practices and trends concerning primary business functions and processes. The course also examines the strategic ramifications for the supply chain in an emerging digital economy.
Prerequisites: (BUAD 2060 with a minimum grade of C and BUAD 3020 with a minimum grade of C) or OSCM 5510 with a minimum grade of C
Term Offered: Spring, Summer, Fall

BUAD 6800 Information Technology And E-Business
[3 credit hours]
This course covers the strategic role of information technology resources, e-commerce initiatives and e-business transformation for competitive advantage, managerial decision support, business process streamlining and inter-firm collaboration. Also covered are analysis of business models, exposure to data analysis tools, evaluation of information system architecture and resource requirements.
Term Offered: Spring, Summer, Fall

BUAD 6900 Strategic Management Capstone
[3 credit hours]
This capstone course integrates business functions toward the strategic management of organizations or subunits thereof. Course pedagogy includes lectures, guest speakers, cases, experiential exercises field projects and simulations.
Prerequisites: (BUAD 6300 with a minimum grade of C and BUAD 6200 with a minimum grade of C and BUAD 6100 with a minimum grade of C) and BUAD 6600 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Summer, Fall

BUAD 6920 Specialization Internship Opportunity
[1-4 credit hours]
Receive practical business experience working in an organization, while meeting with other students and learning about their experiences.
Term Offered: Spring, Summer, Fall

BUAD 6980 Special Topics In Business Administration
[1-4 credit hours]
Independent study to be arranged with the Director, M.B.A. program.
Term Offered: Spring, Summer, Fall

Business Law (BLAW)

BLAW 6100 Business, Government And Society
[3 credit hours]
Discussion of social criticisms of business and of responses which may improve its social performance. Topics include consumerism, ecology, market power, market organization, social responsibility and ethics regulation and public policy, social performance measurement.
Term Offered: Spring, Summer

BLAW 6900 Cannabis Law
[3 credit hours]
This online seminar on Cannabis, which addresses both Marijuana and Hemp, provides a practical guide for managers in navigating laws and regulations related to Cannabis use, distribution and sale; the Legal Environment in which the Cannabis industry and Cannabis businesses operate as well as the ethics supporting the legalization of Cannabis in the United States and states.
Term Offered: Spring, Fall

Cancer Biology (CABP)

CABP 6250 Scientific Communication Skills and Career Goals
[2 credit hours]
Three-fourths of the course will be focused on individual, small group, and whole class participation in communication skills. One fourth of the class will be devoted to information and assessment of individual career options. Web based assessment tools and outside expertise will be recruited for this portion of the class.
Term Offered: Spring

CABP 6270 Advanced Cancer Biology
[3 credit hours]
A comprehensive examination of the cellular and molecular foundation of cancer. Topics to be covered include: neoplasia; epidemiology and etiology; the role of causative agents such as chemicals, radiation, and viruses; cell proliferation, injury, and death; oncogenes; tumor suppressor genes; and an overview of cancer therapy.
Term Offered: Spring, Fall

CABP 6560 Readings in Cancer Biology
[1 credit hour]
A readings and discussion course that will examine classic and current research publications from within the broad realm of cancer biology.
Term Offered: Spring, Fall

CABP 6730 Research in Cancer Biology
[1-15 credit hours]

CABP 6890 Ind Study in Cancer Biology
[1-15 credit hours]
Intensive study in the field of cancer biology including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring, Summer, Fall

CABP 6990 Thesis Research in Cancer Biol
[1-15 credit hours]

CABP 8250 Scientific Communication Skills and Career Goals
[2 credit hours]
Three-fourths of the course will be focused on individual, small group, and whole class participation in communication skills. One fourth of the class will be devoted to information and assessment of individual career options. Web based assessment tools and outside expertise will be recruited for this portion of the class.
Term Offered: Spring

CABP 8270 Advanced Cancer Biology
[3 credit hours]
A comprehensive examination of the cellular and molecular foundation of cancer. Topics to be covered include: neoplasia; epidemiology and etiology; the role of causative agents such as chemicals, radiation, and viruses; cell proliferation, injury, and death; oncogenes; tumor suppressor genes; and an overview of cancer therapy.
Term Offered: Spring, Fall

CABP 8560 Readings in Cancer Biology
[1 credit hour]
This course is designed for Ph.D students to develop professional skills in seminar comprehension, critical peer review, scientific presentation, and communication.
Term Offered: Spring, Fall

CABP 8730 Research in Cancer Biology
[1-15 credit hours]

CABP 8890 Ind Study in Cancer Biology
[1-15 credit hours]
Intensive study in the field of cancer biology including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring, Summer, Fall

CABP 9990 Dissertation Research CABP
[1-9 credit hours]
Formal intensive study of specific topics in cancer biology. Individual studies may include the application of both experimental and theoretical scientific methods, with the goal of advancing our understanding of human cancer. May be repeated for credit.
Term Offered: Spring, Summer, Fall

Career and Technical Education (CTE)

CTE 5010 Teaching Occupational Skills
[3 credit hours]
This course is required for the Health Careers, Career-Technical Education and the six Career-Technical Licenses. This course addresses multiple topics critical to workforce education as they apply to the laboratory environment. Students are provided classroom and clinical experiences designed to assist the beginning teacher with basic laboratory instructional techniques and management strategies that integrate academic, occupational and employability skills in a contextual framework.
Term Offered: Summer

CTE 5020 Occupational Safety And Liability
[3 credit hours]
This course is required for the Adult Education, Career Based Intervention, and Work-Site Teacher/Coordinator endorsements. Occupational health and safety hazards applicable to school, business, and industry, will be examined. Utilizing clinical and classroom experiences students will investigate: the rationale for safety training; strategies to minimize exposure and prevent injuries; specific topics, such as ergonomics, blood borne pathogens, air quality, sound, hazardous materials, back safety, substance abuse, violence in the workplace, etc.
Term Offered: Spring, Summer

CTE 5030 Teaching Occupational Knowledge
[3 credit hours]
This course is required for the Health Careers, Career-Technical Education and the six Career-Technical Licenses. Designed as a co-requisite in the professional education series, this course addresses multiple topics critical to workforce education as they apply to the classroom environment. Students are provided classroom and clinical experiences designed to assist the beginning teacher with basic classroom instructional techniques and management strategies that integrate academic, occupational and employability skills in a contextual framework.
Term Offered: Summer

CTE 5050 Methods Of Teaching Career And Technical Education I
[3 credit hours]
The pedagogical and management skills introduced in CTE 4010 and CTE 4030 (Summer Workshop) are integrated in an applied setting such as a classroom. Learning profiles; employability skills; community partnerships; school-based and work site learning are foundational for student research, reflection, and inquiry. Students are required to develop and apply pedagogical and management skills related to the career technology setting. During these applications, students will be cognizant of and sensitive to issues of diversity, equity and special populations.
Term Offered: Spring, Fall

CTE 5070 Methods Of Teaching Career And Technical Education II
[3 credit hours]
The pedagogical and management skills introduced in CTE 4050 are integrated in an applied setting such as a classroom. Learning profiles; employability skills; community partnerships; school-based and work site learning are foundational for student research, reflection, and inquiry. Students are required to develop and apply pedagogical and management skills related to the career technology setting. During these applications, students will be cognizant of and sensitive to issues of diversity, equity and special populations.
Term Offered: Spring, Fall

CTE 5080 Principles Of School-To-work Transition
[3 credit hours]
Design for educators and employers to increase their knowledge and skill to build partnerships between schools and business, industry and labor. Examines transition concepts, components, implementation strategies and models.
Term Offered: Summer

CTE 5110 CTE Program Guidance and Trends
[3 credit hours]
The career-technical education teacher is an occupational professional who possesses the pedagogical knowledge and reflective decision-making skills necessary to enter the teaching profession at multiple levels. In order to prepare individuals as career-technical instructors, components of the licensure program were developed and approved by the State Board of Education, to promote high professional standards to provide quality classroom teachers. The components necessary to meet these standards are: a clear mission; operational goals; specific competencies of an assessment system and the latest trends in Career and Technical Education.
Term Offered: Spring

CTE 5140 Cooperative Education
[3 credit hours]
This course is required for the Career Based Intervention. The course is designed to present the basic fundamentals of establishing and operating a cooperative occupational program. Students investigate and develop operational procedures to address: student selection; assessing the quality of potential training stations; student placement; school-based learning; critical issues related to work-based learning; critical issues related to work-based learning; minor labor laws; partnering with parents, business, and labor; connecting activities; record keeping; evaluation techniques; etc.
Term Offered: Fall

CTE 5160 Curriculum Development & Teaching
[3 credit hours]
This course is required for the Career Based Intervention. Designed as a study of cooperative education curriculum and instructional methods, the course includes the coordination of school-based instruction with on-the-job work-based experience. Learning styles of diverse students; instructional planning and delivery; classroom management; integrated academics; authentic assessment; safety and liability issues; employability and SCANS skills; community partnerships; school-based and work-site learning; etc. are the basis for student research, reflection, and inquiry.
Term Offered: Spring, Summer

CTE 5180 Promotion, Recruitment & Retention
[3 credit hours]
A study of career and technical education in the community, and promotion, recruitment and retention strategies, including school publics, theories of community power structure and the career and technical school in a democratic society.
Term Offered: Summer, Fall

CTE 5900 Curriculum Construction in Career and Technical Education
[3 credit hours]
This course is a study of occupational analysis and course of study assembly. Occupational instructors will be assisted to conduct program analysis and develop course content through a systematic process.
Term Offered: Fall

CTE 5930 Supervised Teaching
[3 credit hours]
A planned field experience held in public school classrooms under the direction of University Supervisors. Practicing teacher observed planning, presenting and demonstrating teaching skills and managing the laboratory and classroom. During this planned three (3) semester hours the University of Toledo instructor will visit the classroom and laboratory for practical teacher observation.
Term Offered: Spring, Fall

CTE 5990 Individual Study In Career And Technical Education
[1-3 credit hours]
Individual study is designed to provide the opportunity to work individually on professional problems under the direction of the faculty in career and technical education.
Term Offered: Spring, Summer, Fall

CTE 6900 Research Seminar In Career And Technical Education
[3 credit hours]
This course is required for the master's program in Career & Technical Education. Students will undertake an individual research project guided by their career and technical education advisor.
Term Offered: Spring, Fall

CTE 6920 Master's Research Project In Career And Technical Education
[1-3 credit hours]
Open to a graduate student who elects the completion of a research project in fulfilling the research requirement of the master's degree.
Term Offered: Spring

Chemical and Environmental Engineering (CHEE)

CHEE 5410 Bioseparations
[3 credit hours]
Introduction to, analysis and industrial design of processes required to separate and purify proteins and other biological compounds for the downstream processing of bioreactor products. The separations techniques will include filtration, chromatography and crystallization.
Prerequisites: BIOE 3400 with a minimum grade of D- or CHEE 3120 with a minimum grade of D-
Term Offered: Fall

CHEE 5800 Polymer Science And Engineering
[3 credit hours]
Polymerization processes, characterization, structure and properties of polymers, processing and engineering applications of the major polymer types.
Term Offered: Fall

CHEE 5930 Seminars in Chemical Engineering
[0-1 credit hours]
Research topics of current interest to chemical engineers will be presented by internal and external speakers in a research seminar format.
Term Offered: Spring, Fall

CHEE 6010 Green Engineering Principles
[3 credit hours]
The principles of chemical process analysis and design are introduced for the development of green engineering processes. Common components of chemical processes are reviewed and quantitative analyses of process performance and economics developed. The impact of design variables on materials and energy usage is demonstrated.
Term Offered: Fall

CHEE 6110 Green Engineering Applications
[3 credit hours]
Applications of green engineering principles in the chemical industry are discussed. Metrics for comparing process options are introduced along with common techniques for improving process performance.
Prerequisites: CHEE 6010 with a minimum grade of C
Term Offered: Spring

CHEE 6120 Biofuels
[3 credit hours]
The technical, economic, social, and political issues associated with energy consumption are discussed. The potential for biofuels to replace current energy sources is examined based on the historical evolution of the industry and current research activity.
Term Offered: Spring

CHEE 6500 Advanced Chemical Reaction Engineering
[3 credit hours]
Analysis of kinetic, diffusive and flow factors on chemical reactor performance. Topics include batch, plug flow and CSTR reactors, empirical rate expressions, residence time distributions, catalytic reactors, stability and optimization, analysis of catalytic reaction rate expressions.
Term Offered: Spring, Fall

CHEE 6510 Advanced Chemical Engineering Thermodynamics
[3 credit hours]
Advanced treatment of fundamental principles of thermodynamics, especially as related to calculation of phase equilibria. Topics include intermolecular potentials, excess functions, theories of solutions, high-pressure equilibria and introductory statistical mechanics.
Term Offered: Spring, Fall

CHEE 6550 Advanced Fluid Mechanics
[3 credit hours]
Students learn how to formulate and solve engineering problems involving momentum transfer from the microscopic view. Topics include vector/tensor analysis, approximation methods, computational solutions and non-Newtonian fluid phenomena.
Term Offered: Spring, Fall

CHEE 6560 Advanced Heat and Mass Transfer
[3 credit hours]
Students learn how to formulate and solve engineering problems involving simultaneous momentum, heat and mass transfer from the microscopic view. Topics include conduction, radiation, diffusion, forced convection and free convection.
Term Offered: Spring, Fall

CHEE 6860 Polymer Laboratory Methods
[3 credit hours]
Characterization of polymers by physical testing (tensile, creep and rheological), physicochemical methods (viscosity, gel permeation chromatography), thermal analysis, spectroscopy, light microscopy, permeation, density, light scattering and processing.
Term Offered: Spring, Fall

CHEE 6920 Chemical Engineering Project
[1-6 credit hours]
Students will perform a special project of an advanced nature in Chemical Engineering under the supervision of a faculty advisor. The project will culminate in submission of a written report. The course is intended primarily for Masters students pursuing a project Masters in Chemical Engineering.
Term Offered: Spring, Summer, Fall

CHEE 6960 Master's Graduate Research And Thesis
[1-9 credit hours]
Graduate research towards the completion of a Master's Degree.
Term Offered: Spring, Summer, Fall

CHEE 6970 Graduate Engineering Internship
[1-6 credit hours]
Academic advisor approved industrial or non-profit internship to provide an experiential learning component to the Master's/ doctoral degree program.
Prerequisites: GNEN 5000 (may be taken concurrently) with a minimum grade of S
Term Offered: Spring, Summer, Fall

CHEE 6980 Special Topics In Chemical Engineering
[1-6 credit hours]
Selected topics from current chemical engineering research with intensive investigation into the recent literature in an area of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

CHEE 6990 Independent Study In Chemical Engineering
[1-6 credit hours]
The student, under the guidance of their research advisor, explores in-depth specific areas or topics related to their project, thesis, or dissertation research, or other academic interests.
Term Offered: Spring, Summer, Fall

CHEE 8010 Green Engineering Principles
[3 credit hours]
The principles of chemical process analysis and design are introduced for the development of green engineering processes. Common components of chemical processes are reviewed and quantitative analyses of process performance and economics developed. The impact of design variables on materials and energy usage is demonstrated.
Term Offered: Fall

CHEE 8110 Green Engineering Applications
[3 credit hours]
Applications of green engineering principles in the chemical industry are discussed. Metrics for comparing process options are introduced along with common techniques for improving process performance.
Prerequisites: CHEE 8010 with a minimum grade of C
Term Offered: Spring

CHEE 8120 Biofuels
[3 credit hours]
The technical, economic, social, and political issues associated with energy consumption are discussed. The potential for biofuels to replace current energy sources is examined based on the historical evolution of the industry and current research activity.
Term Offered: Spring

CHEE 8500 Advanced Chemical Reaction Engineering
[3 credit hours]
Analysis of kinetic, diffusive and flow factors on chemical reactor performance. Topics include batch, plug flow and CSTR reactors, empirical rate expressions, residence time distributions, catalytic reactors, stability and optimization, analysis of catalytic reaction rate expressions.
Term Offered: Spring, Fall

CHEE 8510 Advanced Chemical Engineering Thermodynamics
[3 credit hours]
Advanced treatment of fundamental principles of thermodynamics, especially as related to calculation of phase equilibria. Topics include intermolecular potentials, excess functions, theories of solutions, high-pressure equilibria and introductory statistical mechanics.
Term Offered: Spring, Fall

CHEE 8550 Advanced Fluid Mechanics
[3 credit hours]
Students learn how to formulate and solve engineering problems involving momentum transfer from the microscopic view. Topics include vector/tensor analysis, approximation methods, computational solutions and non-Newtonian fluid phenomena.
Term Offered: Spring, Fall

CHEE 8560 Advanced Heat and Mass Transfer
[3 credit hours]
Students learn how to formulate and solve engineering problems involving simultaneous momentum, heat and mass transfer from the microscopic view. Topics include conduction, radiation, diffusion, forced convection and free convection.
Term Offered: Spring, Fall

CHEE 8860 Polymer Laboratory Methods
[3 credit hours]
Characterization of polymers by physical testing (tensile, creep and rheological), physicochemical methods (viscosity, gel permeation chromatography), thermal analysis, spectroscopy, light microscopy, permeation, density, light scattering and processing.
Term Offered: Spring, Fall

CHEE 8960 Doctoral Graduate Research And Dissertation
[1-9 credit hours]
Graduate research towards the completion of a Doctoral Degree.
Term Offered: Spring, Summer, Fall

CHEE 8970 Graduate Engineering Internship
[1-6 credit hours]
Academic advisor approved industrial or non-profit internship to provide an experiential learning component to the Master's/ doctoral degree program.
Prerequisites: GNEN 5000 (may be taken concurrently) with a minimum grade of S
Term Offered: Spring, Summer, Fall

CHEE 8980 Special Topics In Chemical Engineering
[1-6 credit hours]
Selected topics from current chemical engineering research with intensive investigation into the recent literature in an area of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

CHEE 8990 Independent Study In Chemical Engineering
[1-6 credit hours]
The student, under the guidance of their research advisor, explores in-depth specific areas or topics related to their project, thesis, or dissertation research, or other academic interests.
Term Offered: Spring, Summer, Fall

Chemistry (CHEM)

CHEM 5230 Chemistry of Sustainable Materials
[4 credit hours]
Applications of the principles of chemistry to understand the issues related to a sustainable energy future.

CHEM 6200 Green Chemistry
[3 credit hours]
Advanced topics in green chemistry, including industrial applications, atom economy, safer solvent substitutions, alternatives assessment, green metrics (PMI, E-factor), basic life cycle analysis, and an introduction to chemical toxicology.
Term Offered: Fall

CHEM 6210 Environmental Chemistry
[3 credit hours]
This course will focus on the chemistry of air, water, and soil with specific emphasis on the effects of human-made chemical products and by-products on the environment. Connections with green chemistry will be highlighted.
Term Offered: Spring

CHEM 6300 Advanced Analytical Chemistry
[4 credit hours]
An overview of new techniques in analytical chemistry. Topics include sample preparation and sampling, spectroscopic, separation, electrochemical, surface characterization and thermal methods. Prerequisite: Permission of department.
Term Offered: Fall

CHEM 6310 Separation Methods
[3 credit hours]
The theory, design and application of separation methods. Topics include extraction techniques, gas, liquid, and supercritical fluid chromatography, affinity and chiral separation, and capillary electrophoresis.
Term Offered: Spring

CHEM 6320 Electrochemistry
[4 credit hours]
A fundamental study of electrochemical concepts, methods, instrumentation and applications. Prerequisite: Permission of department.
Term Offered: Spring

CHEM 6330 Spectroscopic Methods And Analysis Of Spectra
[4 credit hours]
A comprehensive study of theory and instrumentation. Applications of spectroscopic methods including spectral interpretation. Topics include a study of absorption, emission, Raman, NMR, ESR, mass spectrometry, and related subjects. Important methodology and strategy in organic synthesis including disconnection and retrosynthetic analysis.
Term Offered: Spring

CHEM 6340 Mass Spectrometry
[4 credit hours]
The principles and applications of mass spectrometry in chemistry, biochemistry, and related disciplines. Prerequisite: Admitted to the graduate program.

CHEM 6350 Separation Methods Laboratory
[1 credit hour]
Experiments covering topics discussed in CHEM 6310 lectures. Five hours of laboratory per week. Approved chemical safety goggles meeting the American National Standard 287.1-1968 must be worn by every student during every laboratory class meeting.
Corequisites: CHEM 6310
Term Offered: Spring

CHEM 6400 Advanced Organic Chemistry
[4 credit hours]
This course deals with chemical structure and reactivity correlations applied to the study of organic reaction mechanisms; stereochemical features including conformation and stereoelectronic effects; reaction dynamics, isotope effects and molecular orbital theory applied to pericyclic and photochemical reactions; and special reactive intermediates including carbenes, carbanions, and free radicals.
Term Offered: Fall

CHEM 6410 Organic Synthesis
[4 credit hours]
Important methodology and strategy in organic synthesis including disconnection and retrosynthetic analysis.
Term Offered: Spring

CHEM 6430 Medicinal Chemistry
[4 credit hours]
Qualitative and quantitative aspects of the design of new therapeutic agents are discussed. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids will be examined.
Term Offered: Fall

CHEM 6440 Carbohydrate Chemistry
[4 credit hours]
Topics in carbohydrate chemistry, including chemical synthesis of complex oligosaccharides, complex glycoconjugates (glycolipids, glycopeptides, and glycoproteins).
Term Offered: Fall

CHEM 6450 Organic Reaction Mechanisms
[3 credit hours]
This course focuses on a thorough treatment of synthetic chemistry through so-called Named Reactions, as well as extensive study of the underlying mechanisms. Course is often conducted as a “flipped classroom”, and will require viewing pre-recorded lectures outside of the scheduled class time to allow in class time to focus on practical applications of course material.
Term Offered: Fall

CHEM 6500 Advanced Biological Chemistry
[4 credit hours]
The chemistry of cellular and molecular transformations in biochemical systems. Molecular structure of proteins, nucleic acids and membranes. Metabolism and biosynthesis of carbohydrates, amino acids and lipids; gene regulation and replication.
Term Offered: Fall

CHEM 6510 Protein Chemistry
[4 credit hours]
A detailed analysis of the structure and function of proteins. Current methodology for the analysis of structure, the basis for molecular associations and relationships between structure and biological function.
Prerequisites: CHEM 6500 with a minimum grade of D-
Term Offered: Spring

CHEM 6520 Enzymology
[4 credit hours]
Survey of current methods to study enzyme-catalyzed reactions, and application to examples from major enzyme, groups. Current topics in enzymology include abzymes and ribozymes, artificial enzymes, and enzymes, and enzyme engineering.
Term Offered: Spring

CHEM 6570 Biophysical Chemistry
[4 credit hours]
Principles and applications of physical chemistry as applied to biological macromolecules (i.e., proteins and nucleic acids in solution), including thermodynamics, kinetics and spectroscopy of macromolecular interactions.
Prerequisites: (PHYS 2080 with a minimum grade of C- or PHYS 2140 with a minimum grade of C-) and CHEM 3520 with a minimum grade of C-
Term Offered: Fall

CHEM 6600 Physical Inorganic Chemistry
[4 credit hours]
Symmetry, bonding theories, magnetism, and spectroscopic characterization of inorganic compounds are described. Coverage of spectroscopic techniques such as NMR, EPR, UV/VIS, IR, AND Mossbauer focus on applications to inorganic systems.
Term Offered: Fall

CHEM 6610 Chemistry of Transition and Post-Transition Elements
[4 credit hours]
The organometallic chemistry of the transition metals, lanthanides and actinides is described. Synthesis, structure, bonding, and reactivity are considered. Applications in catalysis, bioinorganic, and materials chlemistry are discussed.
Term Offered: Fall

CHEM 6620 Chemistry of the Main Group Elements
[4 credit hours]
The inorganic and organomethallic chemistry of main group elements is described. Synthesis, structure, bonding, and reactivity are considered. The use of main group reagents in synthesis, catalysis, and materials chemistry are discussed.
Term Offered: Spring

CHEM 6710 Quantum Chemistry and Spectroscopy
[4 credit hours]
Fundamental principles of quantum mechanics and their application to model systems, atoms and molecules; Introduction to molecular spectroscopy.
Term Offered: Spring

CHEM 6720 Modern Topics in Physical Chemistry
[4 credit hours]
Advanced topics of current interest is physical chemistry. Examples of topics include nanomaterials science, spectroscopic techniques, or molecular modeling.
Term Offered: Spring, Fall

CHEM 6730 Molecular Modeling
[4 credit hours]
Theory and techniques of contemporary molecular modeling, and their application to calculate physical and chemical properties of realistic molecular systems.
Term Offered: Spring, Fall

CHEM 6800 Advanced Materials Chemistry
[4 credit hours]
Introduction to important classes of solids, including conductors, magnetic materials, ferroelectrics, glasses, microporous materials, organic solids. Traditional and novel synthetic approaches, structure/property relationships, and characterization methods specific to solids.
Prerequisites: CHEM 3740 with a minimum grade of C or PHYS 3310 with a minimum grade of C or PHYS 4630 with a minimum grade of C
Term Offered: Spring

CHEM 6810 Materials Science I
[4 credit hours]
A generic materials science approach to the study of crystalline structure and defects (point, line and planar) in crystalline materials. The mechanisms and kinetics of diffusion in the condensed state.
Term Offered: Fall

CHEM 6820 Materials Science II
[4 credit hours]
A materials science approach to the thermodynamics of condensed state equilibria. Phase transformation kinetics.
Term Offered: Spring

CHEM 6830 Nanomaterials Science
[4 credit hours]
This survey course is intended to serve as an introduction to nanotechnology for non-specialists. It is accessible to students in any technical major, including chemists (all divisions), physicists, and engineers. The fundamentals of nanotechnology will be covered, including the origin of nanoscale properties, synthesis and characterization of nanomaterials (e.g. colloids, nanoparticles, nanowires, nanotubes, DNA-based structures), fabrication of larger-scale structures (e.g. self assembly, lithography), and characterization techniques (e.g. microscopy, microanalysis, spectroscopy). Applications will also be discussed.
Term Offered: Spring, Fall

CHEM 6850 X-Ray Crystallography
[4 credit hours]
Theory and practice of structure determination by X-ray diffraction. Basics of symmetry, diffraction, and reciprocal space. Hands-on introduction to single-crystal and powder methods.
Term Offered: Fall

CHEM 6920 Chemistry Colloquium
[0-1 credit hours]
Presentations on research or current literature.
Term Offered: Spring, Summer, Fall

CHEM 6930 Chemistry Seminar
[0-1 credit hours]
Seminars conducted by individual members of the Department.
Term Offered: Spring, Fall

CHEM 6940 Scientific Communication 1
[1 credit hour]
Instruction on different modes of scientific communication focused on written communication, online resources, and scientific ethics. Tools to enable students to think and converse competently in the language of science.
Term Offered: Fall

CHEM 6950 Scientific Communication 2
[1 credit hour]
Instruction on different modes of scientific communication: written communication, oral presentation, and research proposals, to enable students to think and converse competently in the language of science.
Term Offered: Fall

CHEM 6960 Thesis Research
[1-15 credit hours]
Original investigations of significant chemical problems at the master's level under the guidance of a member of the faculty.
Term Offered: Spring, Summer, Fall

CHEM 6970 Graduate Professional Internship
[1-6 credit hours]
Academic adviser approved industrial or non profit internship to provide an experiential learning component to the MS and PhD degrees in chemistry, including the Professional Science Masters Degree in Green Chemistry and Engineering.

CHEM 6980 Special Topics In Chemistry
[1-4 credit hours]
Discussions of newly developing areas in chemistry research.
Term Offered: Spring, Summer, Fall

CHEM 8200 Green Chemistry
[3 credit hours]
Advanced topics in green chemistry, including industrial applications, atom economy, safer solvent substitutions, alternatives assessment, green metrics (PMI, E-factor), basic life cycle analysis, and an introduction to chemical toxicology.
Term Offered: Fall

CHEM 8210 Environmental Chemistry
[3 credit hours]
This course will focus on the chemistry of air, water, and soil with specific emphasis on the effects of human-made chemical products and by-products on the environment. Connections with green chemistry will be highlighted.
Term Offered: Spring

CHEM 8300 Advanced Analytical Chemistry
[4 credit hours]
An overview of new techniques in analytical chemistry. Topics include sample preparation and sampling, spectroscopic, separation, electrochemical, surface characterization and thermal methods.
Term Offered: Fall

CHEM 8310 Separation Methods
[3 credit hours]
The theory, design and application of separation methods. Topics include extraction techniques, gas, liquid, and supercritical fluid chromatography, affinity and chiral separation, and capillary electrophoresis.
Term Offered: Spring

CHEM 8320 Electrochemistry
[4 credit hours]
A fundamental study of electrochemical concepts, methods, instrumentation and applications. Prerequisite: Permission of department.
Term Offered: Spring

CHEM 8330 Spectroscopic Methods And Analysis Of Spectra
[4 credit hours]
A comprehensive study of theory and instrumentation. Applications of spectroscopic methods including spectral interpretation. Topics include a study of absorption, emission, Raman, NMR, ESR, mass spectrometry, and related subjects. Important methodology and strategy in organic synthesis including disconnection and retrosynthetic analysis.
Term Offered: Spring

CHEM 8340 Mass Spectrometry
[4 credit hours]
The principles and applications of mass spectrometry in chemistry, biochemistry, and related disciplines. Prerequisite: Admitted to the graduate program.

CHEM 8350 Separation Methods Laboratory
[1 credit hour]
Experiments covering topics discussed in CHEM 8310 lectures. Five hours of laboratory per week. Approved chemical safety goggles meeting the American National Standard 287.1-1968 must be worn by every student during every laboratory class meeting.
Corequisites: CHEM 8310
Term Offered: Spring

CHEM 8400 Advanced Organic Chemistry
[4 credit hours]
This course deals with chemical structure and reactivity correlations applied to the study of organic reaction mechanisms; stereochemical features including conformation and stereoelectronic effects; reaction dynamics, isotope effects and molecular orbital theory applied to pericyclic and photochemical reactions; and special reactive intermediates including carbenes, carbanions, and free radicals.
Term Offered: Fall

CHEM 8410 Organic Synthesis
[4 credit hours]
Important methodology and strategy in organic synthesis including disconnection and retrosynthetic analysis.
Term Offered: Spring

CHEM 8430 Medicinal Chemistry
[4 credit hours]
Qualitative and quantitative aspects of the design of new therapeutic agents are discussed. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids will be examined.
Term Offered: Fall

CHEM 8440 Carbohydrate Chemistry
[4 credit hours]
Topics in carbohydrate chemistry, including chemical synthesis of complex oligosaccharides, complex glycoconjugates (glycolipids, glycopeptides, and glycoproteins).
Term Offered: Fall

CHEM 8450 Organic Reaction Mechanisms
[3 credit hours]
This course focuses on a thorough treatment of synthetic chemistry through so-called Named Reactions, as well as extensive study of the underlying mechanisms. Course is often conducted as a “flipped classroom”, and will require viewing pre-recorded lectures outside of the scheduled class time to allow in class time to focus on practical applications of course material.
Term Offered: Fall

CHEM 8500 Advanced Biological Chemistry
[4 credit hours]
The chemistry of cellular and molecular transformations in biochemical systems. Molecular structure of proteins, nucleic acids and membranes. Metabolism and biosynthesis of carbohydrates, amino acids and lipids; gene regulation and replication.
Term Offered: Fall

CHEM 8510 Protein Chemistry
[4 credit hours]
A detailed analysis of the structure and function of proteins. Current methodology for the analysis of structure, the basis for molecular associations and relationships between structure and biological function.
Prerequisites: CHEM 6500 with a minimum grade of D- or CHEM 8500 with a minimum grade of D-
Term Offered: Spring

CHEM 8520 Enzymology
[4 credit hours]
Survey of current methods to study enzyme-catalyzed reactions, and application to examples from major enzyme, groups. Current topics in enzymology include abzymes and ribozymes, artificial enzymes, and enzymes, and enzyme engineering.
Term Offered: Spring

CHEM 8570 Biophysical Chemistry
[4 credit hours]
Principles and applications of physical chemistry as applied to biological macromolecules (i.e., proteins and nucleic acids in solution), including thermodynamics, kinetics and spectroscopy of macromolecular interactions.
Prerequisites: (PHYS 2080 with a minimum grade of C- and PHYS 2140 with a minimum grade of C-) or CHEM 3520 with a minimum grade of C-
Term Offered: Fall

CHEM 8600 Advanced Inorganic And Organometallic Chemistry
[4 credit hours]
Symmetry, bonding theories, magnetism, and spectroscopic characterization of inorganic compounds are described. Coverage of spectroscopic techniques such as NMR, EPR, UV/VIS, IR, AND Mossbauer focus on applications to inorganic systems.
Term Offered: Fall

CHEM 8610 Chemistry of Transition and Post-Transition Elements
[4 credit hours]
The organometallic chemistry of the transition metals, lanthanides and actinides is described. Synthesis, structure, bonding, and reactivity are considered. Applications in catalysis, bioinorganic, and materials chemistry are discussed.
Term Offered: Fall

CHEM 8620 Chemistry of the Main Elements
[4 credit hours]
The inorganic and organometallic chemistry of main group elements is described. Synthesis, structure, bonding, and reactivity are considered. The use of main group reagents in synthesis, catalysis, and materials chemistry are discussed.
Term Offered: Spring

CHEM 8710 Quantum Chemistry and Spectroscopy
[4 credit hours]
Fundamental principles of quantum mechanics and their application to model systems, atoms and molecules; Introduction to molecular spectroscopy.
Term Offered: Spring

CHEM 8720 Modern Topics in Physical Chemistry
[4 credit hours]
Advanced topics of current interest is physical chemistry. Examples of topics include nanomaterials science, spectroscopic techniques, or molecular modeling.
Term Offered: Spring, Fall

CHEM 8730 Molecular Modeling
[4 credit hours]
Theory and techniques of contemporary molecular modeling, and their application to calculate physical and chemical properties of realistic molecular systems.
Term Offered: Spring, Fall

CHEM 8800 Advanced Materials Chemistry
[4 credit hours]
Introduction to important classes of solids, including conductors, magnetic materials, ferroelectrics, glasses, microporous materials, organic solids. Traditional and novel synthetic approaches, structure/property relationships, and characterization methods specific to solids.
Prerequisites: CHEM 3740 with a minimum grade of C or PHYS 3310 with a minimum grade of C or PHYS 4630 with a minimum grade of C
Term Offered: Spring

CHEM 8810 Materials Science I
[4 credit hours]
A generic materials science approach to the study of crystalline structure and defects (point, line and planar) in crystalline materials. The mechanisms and kinetics of diffusion in the condensed state.
Term Offered: Fall

CHEM 8820 Materials Science II
[4 credit hours]
A materials science approach to the thermodynamics of condensed state equilibria. Phase transformation kinetics.
Term Offered: Spring

CHEM 8830 Nanomaterials Science
[4 credit hours]
This survey course is intended to serve as an introduction to nanotechnology for non-specialists. It is accessible to students in any technical major, including chemists (all divisions), physicists, and engineers. The fundamentals of nanotechnology will be covered, including the origin of nanoscale properties, synthesis and characterization of nanomaterials (e.g. colloids, nanoparticles, nanowires, nanotubes, DNA-based structures), fabrication of larger-scale structures (e.g. self assembly, lithography), and characterization techniques (e.g. microscopy, microanalysis, spectroscopy). Applications will also be discussed.
Term Offered: Spring, Fall

CHEM 8850 X-Ray Crystallography
[4 credit hours]
Theory and practice of structure determination by X-ray diffraction. Basics of symmetry, diffraction, and reciprocal space. Hand-on introduction to single-crystal and powder methods.
Term Offered: Fall

CHEM 8920 Chemistry Colloquium
[0-1 credit hours]
Presentations on research or current literature.
Term Offered: Spring, Summer, Fall

CHEM 8930 Chemistry Seminar
[0-1 credit hours]
Seminars conducted by individual members of the Department.
Term Offered: Spring, Fall

CHEM 8940 Scientific Communication 1
[1 credit hour]
Instruction on different modes of scientific communication focused on written communication, online resources, and scientific ethics. Tools to enable students to think and converse competently in the language of science.
Term Offered: Fall

CHEM 8950 Scientific Communication 2
[1 credit hour]
Instruction on different modes of scientific communication: written communication, oral presentation, and research proposals, to enable students to think and converse competently in the language of science.
Term Offered: Fall

CHEM 8960 Dissertation Research
[1-15 credit hours]
Original investigations of significant chemical problems at the Doctoral level under the guidance of a member of the faculty.
Term Offered: Spring, Summer, Fall

CHEM 8970 Graduate Professional Internship
[1-6 credit hours]
Academic adviser approved industrial or non profit internship to provide an experiential learning component to the M.S. and Ph.D. degrees in chemistry, including the Professional Science Masters Degree in Green Chemistry and Engineering.
Term Offered: Summer

CHEM 8980 Special Topics In Chemistry
[1-4 credit hours]
Discussions of newly developing areas in chemistry research.
Term Offered: Spring, Summer, Fall

Civil Engineering (CIVE)

CIVE 5300 Advanced Mechanics Of Materials
[3 credit hours]
Introduction to theory of elasticity, plane-stress and plane-strain problems, yield criteria and failure theories, bending of beams, energy methods, curved flexural members, unsymmetrical bending, torsion, shear center and axisymmetrically loaded members.
Term Offered: Spring, Fall

CIVE 5320 Computer-Aided Analysis of Structures
[3 credit hours]
Matrix analysis of continuous beams, trusses and frames by force method and displacement method. Methods of consistent deformation and slope deflection will be discussed to complement the matrix analysis. Computer applications.
Prerequisites: CIVE 3310 with a minimum grade of D-

CIVE 5430 Structural Steel Design II
[3 credit hours]
Study of local failure in beams, biaxial bending, plate girders, composite beams, semi-rigid composite connections and beam columns.
Term Offered: Spring

CIVE 5440 Reinforced Concrete Design II
[3 credit hours]
Analysis and design of columns under axial compression and biaxial bending. Consideration of bar cutoff, development lengths. Design of two-way slabs and building frames in reinforced concrete. Deflection of beams. Shear design provisions for deep beams.

CIVE 5450 Bridge Design I
[3 credit hours]
Design of the three most common types of short span bridges: concrete slabs, steel stringers and prestressed concrete. Additional topics are bearings, rehabilitation and retrofit and design to minimize maintenance.
Term Offered: Spring, Summer, Fall

CIVE 5480 Reinforced Masonry Design
[3 credit hours]
Study of the design of reinforced and unreinforced masonry design, beams and walls and columns. Working stress design, strength design and empirical design are studied.
Term Offered: Spring, Fall

CIVE 5530 Microbiome and Multi-Omics
[3 credit hours]
Microbiome indicates a group of microbes, and multi-omics are biological tools to understand the role of the microbiome in nature. The course covers the basics of microbiology to the most recent microbiome research and application to various fields such as engineering, environment, and human health. Therefore, the course will be useful, especially for the students who do not have much background knowledge on microbiology but want to have a broad view of how microbes work for us. The class will provide fundamental knowledge of microbiology to the students with different training and backgrounds, such as engineering, science, pharmacy, and medicine. Hands-on experience in the lab as well as with the computers will greatly support students engage the course concepts of microbiome and multi-omics. At the end of the course, students will understand how microbes contribute to environmental sustainability, engineering processes, and human health. Must be junior or senior to enroll.
Term Offered: Spring

CIVE 5610 Hydrology And Water Resources
[3 credit hours]
This course is directed to application of fluid mechanics, hydrology, and hydraulics to the discipline of water resources engineering. Topics covered include flow in closed conduits, flow in open channels, pump systems, surface water hydrology, and computational modeling for hydraulic systems. At the successful completion of this course, the student will learn to apply the fundamental principles to the practical solution of both analysis and design problems in closed and open conduit flows.
Prerequisites: CIVE 1170 with a minimum grade of D- and CHEE 2110 with a minimum grade of D-
Term Offered: Spring, Fall

CIVE 5630 Indoor Air Quality
[3 credit hours]
Characterization of the indoor air pollutants, predictions of indoor air quality levels and indoor air quality control. Four to five design problems involving indoor air quality will be discussed/solved in the class. Special emphasis on indoor radon and asbestos problems in the United States. Use of USEPA program.
Term Offered: Fall

CIVE 5670 Solid Waste Management And Disposal
[3 credit hours]
A basic study of solid waste management concepts including origin, quantities, qualities, collection and disposal of solid waste materials. The course focuses upon municipal wastes and introduces the student to hazardous waste technologies. The primary course objective is to develop environmentally sound landfill design technologies and other ultimate disposal techniques.

CIVE 5680 Environmental Law
[3 credit hours]
An overview of the major federal environmental statutes: Clean Air Act, Clean Water Act, RCRA, CERCLA, etc. and legal perspective of why they were developed. Exposure to some basic legal principles which will be integrated into the overall study of environmental law. Provides a practical perspective on how the law can be applied to situations encountered by environmental engineers and scientists in the real world.
Term Offered: Spring, Fall

CIVE 5690 Sustainability Engineering
[3 credit hours]
Course develops students' abilities to apply the principles of sustainability to engineered sysems. Course topics include sustainability definition and data, life cycle assessment based design, planetary boundaries, greenhouse gas emissions, green construction.
Term Offered: Spring, Fall

CIVE 5710 Advanced Engineering Systems Modeling
[3 credit hours]
A systematic approach to the analysis of complicated engineering system involing uncertain and probabilistic phenomena. Decision-making with multiple objectives, monte carlo simulation, reliability based design, and Markov process are studied.
Term Offered: Spring, Fall

CIVE 5930 Graduate Seminar In Civil Engineering
[1-3 credit hours]
An opportunity for qualified graduate students to pursue a relevant area of Civil Engineering of particular personal interest under the supervision of a faculty member.
Term Offered: Spring, Fall

CIVE 6280 Environmental and Energy Geotechnology
[3 credit hours]
This course is designed for engineering and geoscience students who want to explore a broad range of engineering challenges that emerge at the interface of materials, environment and energy. This course is aimed to provide advanced students with fundamental knowledge for understanding and modelling many complex phenomena involved in a variety of engineering applications. These include technologies of nuclear and hazardous waste disposal, unconventional petroleum and gas extraction, CO2 sequestration and geothermal energy.
Term Offered: Spring

CIVE 6310 Finite Element Methods
[3 credit hours]
Study of direct stiffness method, introduction to the minimum potential energy method and the Galerkin method, formulation of truss, beam, triangular and rectangular elements, applications to the analyses of space trusses, building frames, folded plates, fluid flow and seepage problems. Applications of modern computer software.
Term Offered: Spring, Fall

CIVE 6360 Dynamics Of Structures
[3 credit hours]
Evaluation of dynamic response of structures to arbitrary time-varying loadings; single degree-of-freedom, multi-degree-of-freedom and distributed-parameter systems; partial differential equation formulations of simple systems; mode superposition and wave propagation solutions; time history analysis and estimation of maximum response by spectral analysis; effects of nonlinearities on the structural response.
Term Offered: Spring, Fall

CIVE 6460 Advanced Composite Materials In Infrastructure
[3 credit hours]
Introduction to fiber composites and their applications in repair and retrofit of infrastructure. Strengthening of bridges, buildings, pavements. Understanding of basic concepts involved in design of concrete members reinforced with fiber reinforced polymer.
Term Offered: Spring

CIVE 6480 Prestressed Concrete Structures
[3 credit hours]
Structural behavior and failure modes of prestressed concrete structures; design in prestressed concrete, including long-span structures, bridges and precast systems.
Prerequisites: CIVE 5440 with a minimum grade of D-
Term Offered: Spring, Fall

CIVE 6490 Nonlinear Modeling of Reinforced Concrete
[3 credit hours]
Theories of elasticity and plasticity as applied to reinforced concrete, mechanical properties of concrete and reinforcing bars, linear and nonlinear elastic models, shear response, compression field and smeared crack models, their implementation and application into nonlinear finite element analysis, and performance assessment of plane frame structures.
Prerequisites: CIVE 3420 with a minimum grade of C and CIVE 6310 with a minimum grade of C or CIVE 8310 with a minimum grade of C or MIME 4280 with a minimum grade of C or MIME 5280 with a minimum grade of C

CIVE 6670 Physicochemical Processes for Water Quality Control
[3 credit hours]
The course will discuss theories and designs for water treatment processes.
Term Offered: Spring, Fall

CIVE 6900 Civil Engineering Problems
[3 credit hours]
Special assignment of civil engineering problems of various types at the graduate level.
Term Offered: Spring, Summer, Fall

CIVE 6920 Civil Engineering Project
[1-6 credit hours]
The student performs a special project of an advanced nature in civil engineering. The course is primarily intended for students pursuing a Masters degree with the project option in Civil Engineering.
Term Offered: Spring, Summer, Fall

CIVE 6960 Graduate Research And Thesis - Masters
[1-9 credit hours]
MS student should register their adviser's section number.
Term Offered: Spring, Summer, Fall

CIVE 6970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Master's/doctoral degree program.
Term Offered: Spring, Summer, Fall

CIVE 6980 Special Topics in Civil and Environmental Engineering
[1-6 credit hours]
This course is offered on selected subjects in a field in civil or environmental engineering with intensive investigation of the recent literature in an area of special interest to the class and the instructor.
Term Offered: Spring, Summer, Fall

CIVE 6990 Independent Study in Civil and Environmental Engineering
[1-6 credit hours]
The student, under the guidance of their research advisor, explores in-depth specific areas or topics related to their project, thesis, or dissertation research, or other academic interests.
Term Offered: Spring, Summer, Fall

CIVE 7430 Structural Steel Design II
[3 credit hours]

CIVE 7450 Bridge Design I
[3 credit hours]
Design of the three most common types of short span bridges: concrete slabs, steel stringers and prestressed concrete. Additional topics are bearings, rehabilitation and retrofit and design to minimize maintenance.
Term Offered: Spring, Fall

CIVE 7900 Independent Problems
[1-6 credit hours]

CIVE 8280 Environmental and Energy Geotechnology
[3 credit hours]
This course is designed for engineering and geoscience students who want to explore a broad range of engineering challenges that emerge at the interface of materials, environment and energy. This course is aimed to provide advanced students with fundamental knowledge for understanding and modelling many complex phenomena involved in a variety of engineering applications. These include technologies of nuclear and hazardous waste disposal, unconventional petroleum and gas extraction, CO2 sequestration and geothermal energy.
Term Offered: Spring

CIVE 8310 Finite Element Methods
[3 credit hours]
Study of direct stiffness method, introduction to the minimum potential energy method and the Galerkin method, formulation of truss, beam, triangular and rectangular elements, applications to the analyses of space trusses, building frames, folded plates, fluid flow and seepage problems. Applications of modern computer software.
Term Offered: Spring, Fall

CIVE 8360 Dynamics Of Structures
[3 credit hours]
Evaluation of dynamic response of structures to arbitrary time-varying loadings; single degree-of-freedom, multi-degree-of-freedom and distributed-parameter systems; partial differential equation formulations of simple systems; mode superposition and wave propagation solutions; time history analysis and estimation of maximum response by spectral analysis; effects of nonlinearities on the structural response.
Term Offered: Spring, Fall

CIVE 8460 Advanced Composite Materials In Infrastructure
[3 credit hours]
Introduction to fiber composites and their applications in repair and retrofit of infrastructure. Strengthening of bridges, buildings, pavements. Understanding of basic concepts involved in design of concrete members reinforced with fiber reinforced polymer.
Term Offered: Spring

CIVE 8490 Nonlinear Modeling of Reinforced Concrete
[3 credit hours]
Theories of elasticity and plasticity as applied to reinforced concrete, mechanical properties of concrete and reinforcing bars, linear and nonlinear elastic models, shear response, compression field and smeared crack models, their implementation and application into nonlinear finite element analysis, and performance assessment of plane frame structures.
Prerequisites: CIVE 3420 with a minimum grade of C and CIVE 6310 with a minimum grade of C or CIVE 8310 with a minimum grade of C or MIME 4280 with a minimum grade of C or MIME 5280 with a minimum grade of C

CIVE 8670 Physicochemical Processes for Water Quality Control
[3 credit hours]
The course will discuss theories and designs for water treatment processes.
Term Offered: Spring, Fall

CIVE 8900 Independent Problems
[1-6 credit hours]
Ph.D. student should register their adviser's section number.
Term Offered: Spring, Summer, Fall

CIVE 8960 Doctoral Graduate Research & Dissertation
[1-16 credit hours]
Graduate research towards the completion of a Doctoral degree.
Term Offered: Spring, Summer, Fall

CIVE 8970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Master's/doctoral degree program.
Term Offered: Spring, Summer, Fall

CIVE 8980 Special Topics in Civil and Environmental Engineering
[1-6 credit hours]
This course is offered on selected subjects in a field in civil or environmental engineering with intensive investigation of the recent literature in an area of special interest to the class and the instructor.
Term Offered: Spring, Summer, Fall

CIVE 8990 Independent Study in Civil and Environmental Engineering
[1-6 credit hours]
The student, under the guidance of their research advisor, explores in-depth specific areas or topics related to their project, thesis, or dissertation research, or other academic interests.
Term Offered: Spring, Summer, Fall

Counseling (COUN)

COUN 5010 Professional Orientation To School Counseling
[4 credit hours]
This course is an introduction to the profession of school counseling including the historical foundations, roles and responsibilities, legal and ethical issues, implications of sociocultural diversity, organization and administration, and future trends within the context of the school community.
Term Offered: Spring, Summer, Fall

COUN 5020 Professional Orientation to Clinical Mental Health Counseling
[4 credit hours]
An orientation to the counseling profession; ethical and legal issues, counseling process, skills and theories; counselor roles, functions and work settings; and historical foundations of counseling.
Term Offered: Spring, Summer, Fall

COUN 5110 Career Counseling And Development
[3 credit hours]
Theories, resources and practices of career counseling and development are presented. Knowledge and skills for promoting career growth among a broad range of individuals across the life span is emphasized.
Term Offered: Spring, Summer, Fall

COUN 5120 Individual And Group Assessment
[3 credit hours]
This course provides an in-depth understanding of psychological testing through (1) an overview of basic testing concepts, (2) an understanding of test construction, (3) familiarity with instruments and (4) an overview of using test results. History and rationale of testing are included.
Term Offered: Summer, Fall

COUN 5130 Group Counseling
[4 credit hours]
This course provides training and experience in group development, dynamics, theories, methods and skills of group counseling, group leadership, research and evaluation, ethical issues, and other group work approaches. Multicultural issues, advocacy, and wellness will be explored throughout the course.
Prerequisites: (COUN 5140 with a minimum grade of C or COUN 7140 with a minimum grade of C) and (COUN 5180 with a minimum grade of C or COUN 7180 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

COUN 5140 Counseling Theories and Application
[4 credit hours]
Includes a study of counseling and consultation theories and application of theory in therapeutic/helping relationships from individual, group, and systemic perspectives.
Term Offered: Spring, Summer, Fall

COUN 5150 Counseling Across The Life Span
[3 credit hours]
This course provides training in the theoretical understanding and processes of human development (e.g., social, affective, familial, cognitive, physical) from prenatal stages through older adulthood. Counseling approaches relevant to theoretical principles will be presented. Multicultural issues, advocacy, wellness, and ethical issues will be explored throughout the course. Theories of individual and family development across the lifespan are examined. Developmental processes of individuals and families and implications for counseling are presented from a multi#generational family perspective.
Term Offered: Spring, Summer, Fall

COUN 5160 Cultural Diversity For Counselors And School Psychologists
[3 credit hours]
This course addresses sociocultural diversity, multicultural, and social justice concepts related to self and others. Throughout the course the tripartite model of multicultural attitudes, knowledge, and skills will be explored using an inclusive definition of multiculturalism. We will examine multiculturalism and social justice on individual, community, and systemic levels. Wellness, prevention, and advocacy will also be infused throughout the course. Addresses the cross cultural theories, knowledge, beliefs and techniques required for providing effective services to culturally diverse populations. Examines assumptions about cultural differences, which underlie counseling theories and therapies.
Term Offered: Spring, Summer, Fall

COUN 5180 Counseling Skills
[4 credit hours]
This course is an introduction to the basic helping/microskills used in individual, group, and systemic therapeutic settings. These are the foundational counseling skills necessary in the preparation of school and clinical mental health counselors. Supervised training prepares students for their entry-level clinical practicum experience.
Term Offered: Spring, Fall

COUN 5190 Counseling Practicum
[4 credit hours]
Students receive supervised, practical experiences in providing counseling services to clients. Performance of counseling skills; relationship skills; intervention techniques; documentation skills; and professional, ethical and legal conduct is expected.
Term Offered: Spring, Summer, Fall

COUN 5600 Psychopathology: Conceptualizations and Assessment
[4 credit hours]
This course explores conceptualizations of psychopathology, the assessment thereof, and subsequent treatment planning in counseling. #Special emphasis will be given to the MMPI, NEO-PI, MCMI, and a battery of substance use disorder screens.
Prerequisites: COUN 5120 with a minimum grade of C
Term Offered: Spring, Fall

COUN 5980 Special Topics In Counseling, Mental Health, And School Psychology
[1-8 credit hours]
This course is open to a graduate student pursuing a master's, specialist or doctoral degree program and may be a requirement of that program.
Term Offered: Spring, Summer, Fall

COUN 6000 Counseling Research and Program Evaluation
[3 credit hours]
This course focuses on the research and program evaluation in professional counseling, covering basic statistics and related research design with specific applications counseling. Students will be expected to critique existing counseling research. Material covered in this course should provide the student with the skills necessary to be a competent consumer as well as producer of research. Students will gain skills in the preparation of research problems, design and implementation of quantitative and qualitative research and methodology in the field of counseling.
Term Offered: Spring, Summer, Fall

COUN 6100 Comprehensive School Counseling Programs
[4 credit hours]
Emphasis in this course is placed on the skills necessary to assess K-12 students' needs, design a program of comprehensive services, and coordinate, implement, and evaluate the program's activities. This includes counseling strategies for the school counselor that promote academic and personal/social development in children and youth. Finally, a thorough study of consulting models and techniques to help school counselors develop consultation skills, which may be applied when working with school personnel, administrators, parents, and mental health clinicians in community agencies, or other settings.
Prerequisites: COUN 5010 with a minimum grade of B-
Term Offered: Spring

COUN 6110 Counseling Diverse Learners in the K-12 Setting
[3 credit hours]
This course provides school counseling students with an overview of special education services and the unique needs of diverse learners in the K-12 setting. Students will explore the categories of eligibility for special education and gifted services, education law, and the 504 process. Additional topics include the identification of students through RTI or MTSS and appropriate interventions the school counselor can implement to support diverse learners across the academic, social/emotional and career domains.
Term Offered: Spring, Fall

COUN 6200 Advanced Counseling Skills
[3 credit hours]
As a primarily experiential course, COUN 6200 is designed to advance students' professional competencies in counseling theory, skills, and reflective practice. This course builds upon the prior learning experiences acquired in COUN 5140 (Counseling Theories) and Counseling Skills (COUN 5180). Students will practice in theoretically consistent skills and techniques and will adhere to the Ethical and Professional Standards set forth by the American Counseling Association Code of Ethics.
Prerequisites: COUN 5140 with a minimum grade of C and COUN 5180 with a minimum grade of C
Term Offered: Spring

COUN 6220 Child, Adolescent, Family Therapy
[3 credit hours]
Specialized study of therapeutic techniques commonly emphasized in working with children, adolescents and their families. Approaches to family therapy in a multicultural context, family assessment and ethical issues will be emphasized.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Summer, Fall

COUN 6230 Crisis Intervention Counseling
[3 credit hours]
Instruction in the theories, skills and techniques necessary to intervene into a variety of crisis situations such as suicide, violence, domestic violence, drug and alcohol abuse and family dysfunction.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

COUN 6240 Diagnosis And Mental Health
[4 credit hours]
Study of the signs, symptoms, etiology and psychodynamics of various mental and emotional disorders based on the most current edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM).
Term Offered: Summer, Fall

COUN 6460 Substance Abuse Counseling
[4 credit hours]
Review of treatment approaches, techniques and programs for counseling individuals and families experiencing substance-related problems.
Term Offered: Spring, Fall

COUN 6940 Counseling Internship
[1-8 credit hours]
The course is intended to provide counselor education doctoral students with student-directed, practical experiences in which they can develop advanced skills in various facets of counselor education (e.g., clinical counseling, advocacy, instruction, research, leadership, clinical supervision). Multicultural issues, ethics, professional issues, and wellness will be explored throughout the course. Supervised practical experiences in various settings while assuming a spectrum of counseling roles and functions. Emphasis is placed upon integrating ethical practice, theory, and research in work settings.
Prerequisites: COUN 5190 with a minimum grade of B or CMHS 5190 with a minimum grade of B
Term Offered: Spring, Summer, Fall

COUN 6990 Master's Independent Study
[1-4 credit hours]
Provides students the opportunity to work independently on professional problems under the direction of a faculty member in the Department of Counseling and Mental Health Services.
Term Offered: Spring, Summer, Fall

COUN 7140 Counseling Theories and Application
[4 credit hours]
Includes a study of counseling and consultation theories and application of theory in therapeutic/helping relationships from individual, group, and systemic perspectives.
Term Offered: Spring, Summer, Fall

COUN 7160 Cultural Diversity For Counselors And School Psychologists
[3 credit hours]
This course addresses sociocultural diversity, multicultural, and social justice concepts related to self and others. Throughout the course the tripartite model of multicultural attitudes, knowledge, and skills will be explored using an inclusive definition of multiculturalism. We will examine multiculturalism and social justice on individual, community, and systemic levels. Wellness, prevention, and advocacy will also be infused throughout the course. Addresses the cross cultural theories, knowledge, beliefs and techniques required for providing effective services to culturally diverse populations. Examines assumptions about cultural differences, which underlie counseling theories and therapies.
Term Offered: Spring, Summer, Fall

COUN 7220 Child, Adolescent, Family Therapy
[3 credit hours]
Specialized study of therapeutic techniques commonly emphasized in working with children, adolescents and their families. Approaches to family therapy in a multicultural context, family assessment and ethical issues will be emphasized.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Summer, Fall

COUN 7230 Crisis Intervention Counseling
[3 credit hours]
Instruction in the theories, skills and techniques necessary to intervene into a variety of crisis situations such as suicide, violence, domestic violence, drug and alcohol abuse and family dysfunction.
Prerequisites: COUN 5140 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

COUN 7240 Diagnosis And Mental Health
[4 credit hours]
Study of the signs, symptoms, etiology and psychodynamics of various mental and emotional disorders based on the most current edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM).
Term Offered: Summer, Fall

COUN 8460 Substance Abuse Counseling
[4 credit hours]
Review of treatment approaches, techniques and programs for counseling individuals and families experiencing substance-related problems.
Term Offered: Spring, Fall

COUN 8960 Doctoral Research Dissertation
[1-12 credit hours]
Dissertation credit may not total less than 10 semester hours and no greater than 32 hours. A doctoral student may register for such credit in more than one semester.
Term Offered: Spring, Summer, Fall

Criminal Justice (CRIM)

CRIM 6000 Advanced Theories: Criminal Justice
[3 credit hours]
This course critically examines contributions made b a variety of theorists to an understanding of crime/deviance and reactions to it.
Term Offered: Spring

CRIM 6200 Data Analysis In Criminal Justice
[3 credit hours]
This course provides students with a basic understanding of fundamental data analysis techniques utilized in criminal justice research.
Term Offered: Spring, Fall

CRIM 6300 Advanced Studies In Ethics And Criminal Justice
[3 credit hours]
This course is designed to provide students with the opportunity to integrate ethics in an understanding of criminal justice.
Term Offered: Spring, Summer, Fall

CRIM 6310 Juvenile Justice In The Metropolitan Community
[3 credit hours]
Criminal justice theories of delinquency are studied and compared with a paradigmatic foundation of current criminal justice processes.
Term Offered: Fall

CRIM 6320 Women, Crime And Criminal Justice
[3 credit hours]
This course explores women as offenders, victims and professionals in criminal justice.
Term Offered: Summer

CRIM 6400 Graduate Criminal Justice Research Methodology
[3 credit hours]
This course is designed to provide students with an understanding of criminal justice research.
Term Offered: Fall

CRIM 6590 Administration Of Criminal Justice
[3 credit hours]
A research-oriented course into the relationship of the major structures of criminal justice-police, prosecutor, courts and corrections with emphasis on the development of performance evaluation criteria.
Term Offered: Spring, Fall

CRIM 6620 Police And Society
[3 credit hours]
An examination of the role of the police in contemporary America, emphasizing the ambivalence of the self-image of the police and the social and political forces that compete to redefine the police function.
Term Offered: Spring, Summer, Fall

CRIM 6940 Criminal Justice Graduate Internship
[1-3 credit hours]
Field placement experience in an approved criminal justice agency to enhance the knowledge of the student.
Term Offered: Spring, Summer, Fall

CRIM 6950 Policy Projects In Criminal Justice
[3 credit hours]
Students will demonstrate their knowledge and skills gained in the program via the development of a comprehensive policy project. This analysis will focus on a contemporary issue in criminology or criminal justice, selected by the student and approved by professor. Students will be expected to develop a plan to assess the theoretical background and empirical research relevant to the issue, then research the problem and develop informed policy.
Prerequisites: CRIM 6000 with a minimum grade of D- and CRIM 6200 with a minimum grade of D- and CRIM 6400 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

CRIM 6980 Special Topics In Criminal Justice
[3 credit hours]
Content will vary as instructors present a single concentration on developments, problems and controversies in criminal justice.
Term Offered: Spring, Summer, Fall

CRIM 6990 Independent Study In Criminal Justice
[1-3 credit hours]
Directed study in criminal justice under the supervision of a criminal justice faculty member.
Term Offered: Spring, Summer, Fall

Curriculum and Instruction: Early Childhood (CIEC)

CIEC 5000 Ece: Philosophy And Practice
[3 credit hours]
A comprehensive introduction to the profession of early childhood education by examining relevant issues as they relate to overall development of children ages birth to eight years.
Term Offered: Spring, Summer, Fall

CIEC 5070 Effective Teaching Practices, Pre-K To 3rd Grade
[3 credit hours]
This course is designed to apply characteristics of best practice to curriculum development and implementation with adherence to the national and state curriculum standards as they apply to children, age 3 to 8, with diverse educational needs.
Prerequisites: Upper Division with a score of 1
Corequisites: CIEC 3380
Term Offered: Spring, Fall

CIEC 5150 Setting The Stage For Early Childhood Learning: Inspirations From Reggio Emilia
[3 credit hours]
This course will explore Reggio's philosophy of early childhood education and the numerous ways that children explore the "hundred languages." Reggio uses these languages (art, clay, wire, sculpture, light, shadow, etc.) as a way to help children represent their world and what they know about it.
Term Offered: Spring, Summer

CIEC 5340 Infant/Toddler Curriculum
[3 credit hours]
Introduction to the sequential development of the young child from birth to 3 years. Students will engage in field hours in infant-toddler settings, design learning materials and critique research in topics related to infant/toddler curriculum.
Term Offered: Spring, Summer, Fall

CIEC 5350 Public Policy And Advocacy In Early Childhood Education
[3 credit hours]
Students will understand the implications of social, political and economic policies on the emergence of services for young children in the 21st century.
Prerequisites: CIEC 5000 with a minimum grade of C
Term Offered: Spring, Summer, Fall

CIEC 5380 Field Experience Cohort I
[3 credit hours]
This course aligns with the graduate Cohort II coursework (CIEC 5070).
Prerequisites: EDP 5210 with a minimum grade of C
Corequisites: CIEC 5070
Term Offered: Spring, Fall

CIEC 5460 Science Methods For Early Childhood Education
[3 credit hours]
This course is designed to help teachers of science in grades Pre-Kindergarten through third to understand the concepts, ideas and applications of science in the real world. Students will learn how scientific thinking involves collecting data, analyzing data, making decisions and taking action based on those decisions. Students will learn how to plan effective science experience for young children that cause them to explore environments and act upon their descoveries. Students will learn how to assess the scientific thinking of young children appropriately, using formal and infornal strategies.
Term Offered: Spring, Fall

CIEC 5480 Practicum I
[1 credit hour]
Practicum is a supervised opportunity for students to gain experience in the classroom and other settings that provide instruction to children in a Kindergarten through 5th grade classroom. Students will focus on lesson plan implementation, differentiated instruction, behavior management strategies and assessment of student learning. The course further assists students in acquiring the necessary knowledge and skills needed to function as an educator in a changing and diverse society. Furthermore, activities will assist students in the field of primary education to: understand learners and the learning processes; gain experience using of instructional technology necessary for professional practice; work effectively in both professional and community roles. Students in this practicum will focus their planning on Literacy, Reading Development, Phonics and Science content standards, while practicing integrated curricular design and developmentally appropriate practices for children in Kindergarten through 5th grade.
Corequisites: CIEC 5460
Term Offered: Spring, Fall

CIEC 5520 Multisensory Experiences
[3 credit hours]
Development and sensory principles underlying the planning and implementation of developmentally appropriate learning activities for young children. Technical content will include the physical and neurological bases for learning.

CIEC 5550 Teaching Methods For Early Childhood Social Studies
[3 credit hours]
In depth study of methods and materials for teaching social studies from pre-school to third grade. Implementation of early childhood curriculum within the context of current technology and the development of critical thinking skills.
Prerequisites: CIEC 5460 with a minimum grade of C
Corequisites: CIEC 5770
Term Offered: Spring, Fall

CIEC 5770 Practicum II
[1 credit hour]
Practicum is a supervised opportunity for students to gain experience in the classroom and other settings that provide instruction to children in an early childhood setting. Students will focus on lesson plan implementation, differentiated instruction, behavior management strategies and assessment of student learning in their practicums. The course further assists students in acquiring the necessary knowledge and skills needed to function as an educator in a changing and diverse society. Furthermore, activities will assist students in the field of primary education to: understand learners and the learning processes; gain experience using of instructional technology necessary for professional practice; work effectively in both professional and community roles.
Prerequisites: CIEC 5480 with a minimum grade of C
Corequisites: CIEC 5550
Term Offered: Spring, Fall

CIEC 5980 Special Topics In Early Childhood Education
[1-5 credit hours]
A course developed around topics of interest and concern to inservice teachers within districts served by the Center for Educational Research and Services. Stresses solution and resolution of educational problems occurring within the district.
Term Offered: Spring, Summer, Fall

CIEC 5990 Graduate Independent Study In Early Childhood Education
[1-5 credit hours]
Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of the faculty in Early Childhood Education.
Term Offered: Spring, Summer, Fall

CIEC 6310 Pre-K/Primary Curriculum
[3 credit hours]
The study and design of early childhood curriculum from a best practice/developmental perspective including integrated curriculum, anti-bias approaches, authentic assessment, direct learning strategies. Student self assessment and change project required.
Term Offered: Spring, Fall

CIEC 6320 Meaning And Development Of Play Behavior
[3 credit hours]
Theoretical bases of play behavior and its role in curriculum development/assessment. Students implement and evaluate a sociodramatic play kit and conduct library research on one aspect of play behavior.
Term Offered: Spring, Summer

CIEC 6330 Language And Concept Development
[3 credit hours]
Study of the language and literacy development of the young child with emphasis upon the factors that influence and support this development. Students will do projects to implement their learning.
Term Offered: Spring, Summer, Fall

CIEC 6750 Developmental And Classroom Assessment
[3 credit hours]
Focuses upon teaching and learning in a developmental learning environment. Emphases includes observing the developmental characteristics of young children and assessment for prescriptive teaching.
Term Offered: Spring, Summer, Fall

CIEC 6900 Masters Research Seminar In Early Childhood Educaton
[2-3 credit hours]
Examination of research and current issues in early childhood education. Emphasis on theory and research and evaluation models.
Prerequisites: CIEC 6950 with a minimum grade of C
Term Offered: Spring

CIEC 6920 Masters Research Project In Early Childhood Education
[1-3 credit hours]
Student will complete an individual research project under the direction of a committee of at least two faculty members in Early Childhood ordinarily involving the faculty advisor.

CIEC 6940 Internship/Student Teaching In Primary Education
[4 credit hours]
Internship is a supervised opportunity for students to gain experience in the classroom and other settings that provide instruction to children in an primary education setting. Students will focus on lesson plan implementation, differentiated instruction, behavior management strategies and assessment of student learning in their internships. The course further assists students in acquiring the necessary knowledge and skills needed to function as an educator in a changing and diverse society. Furthermore, activities will assist students in the field of primary education to: understand learners and the learning processes; gain experience using of instructional technology necessary for professional practice; work effectively in both professional and community roles.
Prerequisites: CIEC 5770 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CIEC 6950 Theory And Research In Early Childhood
[3 credit hours]
Review and analysis of theory and research related to rationale and methods for program options for young children. Critique research and prepare a review of synthesis of research.
Term Offered: Fall

CIEC 8310 Pre-K/Primary Curriculum
[3 credit hours]
The study and design of early childhood curriculum from a best practice/developmental perspective including integrated curriculum, anti-bias approaches, authentic assessment, direct learning strategies. Student self assessment and change project required.
Term Offered: Spring, Fall

CIEC 8320 Meaning And Development Of Play Behavior
[3 credit hours]
Theoretical bases of play behavior and its role in curriculum development/assessment. Students implement and evaluate a sociodramatic play kit and conduct library research on one aspect of play behavior.
Term Offered: Spring, Summer

CIEC 8330 Language And Concept Development
[3 credit hours]
Study of the language and literacy development of the young child with emphasis upon the factors that influence and support this development. Students will do projects to implement their learning.
Term Offered: Spring, Summer, Fall

CIEC 8750 Developmental And Classroom Assessment
[3 credit hours]
Focuses upon teaching and learning in a developmental learning environment. Emphases includes observing the developmental characteristics of young children and assessment for prescriptive teaching.
Term Offered: Spring, Summer, Fall

CIEC 8900 Doctoral Seminar In Early Childhood Education
[2-4 credit hours]
This seminar will consider problems and provide advanced study for doctoral students in Early Childhood Education.
Term Offered: Spring, Fall

CIEC 8930 Independent Research In Early Childhood Education
[1-5 credit hours]
Individual study is designed to provide the doctoral student opportunity to work individually on professional problems under the direction of Early Childhood faculty.
Term Offered: Spring, Summer, Fall

CIEC 8950 Theory And Research In Early Childhood
[3 credit hours]
Review and analysis of theory and research related to rationale and methods for program options for young children. Critique research and prepare a review of synthesis of research.

CIEC 8960 Dissertation In Early Childhood Education
[1-12 credit hours]
Original research in an area of early childhood education.
Term Offered: Spring, Summer, Fall

Curriculum and Instruction (CI)

CI 5470 Literacy Assessment and Remediation
[3 credit hours]
Examine current evidence-based literacy practices in assessment and remediation. Emphasis on knowledge and skill needed to diagnose and assess students in reading and writing by working with an at-risk learner in a public school setting. Apply word identification, comprehension, fluency, vocabulary and writing instructional strategies for supporting readers in an experiential learning environment.
Prerequisites: Upper Division with a score of 1 or CI 3400 with a minimum grade of C and CI 3430 with a minimum grade of C and CI 3460 with a minimum grade of C
Term Offered: Spring, Summer, Fall

CI 5490 Content Area Literacy
[3 credit hours]
Study of the integration of reading comprehension, writing, oral language and word skill development and digital literacies in all areas of learning. Attention will be given to instructional methods as well as assessment practices.
Term Offered: Spring, Summer, Fall

CI 5510 Mathematics For The Young Child
[3 credit hours]
Development of mathematical understanding in young children, appropriate learning and assessment experiences and analysis of curriculum. Mathematics focus on place value, number sense, geometry, measurement, algebra, data analysis and probability.
Term Offered: Spring, Fall

CI 5980 Special Topics In Curriculum & Instruction
[1-5 credit hours]
A course developed around topics of interest and concern to educators.
Term Offered: Spring, Summer, Fall

CI 5990 Graduate Independent Study In Curriculum And Instruction
[1-5 credit hours]
Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of the faculty of the Department of Curriculum and Instruction.
Term Offered: Spring, Summer, Fall

CI 6110 Language Arts Methods of Teaching
[3 credit hours]
An initial in-depth study of methods and materials for teaching and learning the English Language Arts in middle and secondary classrooms with emphasis on planning, content standards and instructional strategies that attend to students as learners; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6210
Term Offered: Fall

CI 6120 Social Studies Methods of Teaching
[3 credit hours]
An initial in-depth study of methods and materials for teaching and learning Social Studies in middle and secondary classrooms with emphasis on planning, content standards and instructional strategies that attend to students as learners; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program.
Corequisites: CI 6220
Term Offered: Fall

CI 6130 Mathematics Method of Teaching
[3 credit hours]
An initial in-depth study of methods and materials for teaching and learning Mathematics in middle and secondary classrooms with emphasis on planning, content standards and instructional strategies that attend to students as learners; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6230
Term Offered: Fall

CI 6140 Science Methods of Teaching
[3 credit hours]
An initial in-depth study of methods and materials for teaching and learning Science in middle and secondary classrooms with emphasis on planning, content standards and instructional strategies that attend to students as learnners; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Term Offered: Fall

CI 6150 Advanced Methods of Teaching in Language Arts
[3 credit hours]
A continued in-depth study of methods and materials for teaching and learning the English Language Arts in middle and secondary classrooms with an emphasis on academic language and classroom level assessments; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6110 with a minimum grade of C or CI 6120 with a minimum grade of C or CI 6130 with a minimum grade of C or CI 6140 with a minimum grade of C
Corequisites: CI 6250
Term Offered: Spring

CI 6160 Social Studies Advanced Methods of Teaching
[3 credit hours]
A continued in-depth study of methods and materials for teaching and learning Social Studies in middle and secondary classrooms with an emphasis on academic language and classroom level assessments; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6110 with a minimum grade of C or CI 6120 with a minimum grade of C or CI 6130 with a minimum grade of C or CI 6140 with a minimum grade of C
Corequisites: CI 6260
Term Offered: Spring

CI 6170 Mathematics Advanced Methods of Teaching
[3 credit hours]
A continued in-depth study of methods and materials for teaching and learning Mathematics in middle and secondary classrooms with an emphasis on academic language and classroom level assessments; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6110 with a minimum grade of C or CI 6120 with a minimum grade of C or CI 6140 with a minimum grade of C or CI 6130 with a minimum grade of C
Corequisites: CI 6270
Term Offered: Spring

CI 6180 Science Advanced Methods of Teaching
[3 credit hours]
A continued in-depth study of methods and materials for teaching and learning Science in middle and secondary classrooms with an emphasis on academic language and classroom level assessments; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6120 with a minimum grade of C or CI 6130 with a minimum grade of C or CI 6140 with a minimum grade of C
Corequisites: CI 6280
Term Offered: Spring

CI 6190 Ambitious Teaching in PK-12 Classrooms
[3 credit hours]
Designed for graduate students studying teaching and learning, this course explores current ideas about ambitious and culturally responsive PK-12 teaching and a teacher's role in the classroom. Ideas underlying dilemmas of teaching subject matter for all learners will be examined within student-authored cases of teaching. Students reflect on their experiences in the classroom to examine their personal role as an ambitious PK-12 classroom teacher.
Term Offered: Spring, Fall

CI 6210 Practicum in Teaching Language Arts
[1 credit hour]
Initial field experience for LAMP Middle Childhood and Adolescent to Young Adult licensure only; experiences include focused observations in classroom settings, co-teaching with mentor teacher and the design, planning and teaching of units that integrate the English Language Arts. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6110
Term Offered: Fall

CI 6220 Practicum in Teaching Social Studies
[1 credit hour]
Initial field experience for LAMP Middle Childhood and Adolescent to Young Adult licensure only; experiences include focused observations in classroom settings, co-teaching with mentor teacher and the design, planning and teaching of units that integrate Social Studies. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6120
Term Offered: Fall

CI 6230 Practicum in Teaching Mathematics
[1 credit hour]
Initial field experience for LAMP Middle Childhood and Adolescent to Young Adult licensure only, experiences include focused observations in classroom settings, co-teaching with mentor teacher and the design, planning and teaching of units that integrate Mathematics. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6130
Term Offered: Fall

CI 6240 Practicum in Teaching Science
[1 credit hour]
Initial field experience for LAMP Middle Childhood and Adolescent to Young Adult licensure only; experiences include focused observations in classroom settings, co-teaching with mentor teacher and the design, planning and teaching of units that integrate Science. Admission to SECE or MIDD LAMP program required.
Corequisites: CI 6140
Term Offered: Fall

CI 6250 Internship/Student Teaching in Language Arts
[4 credit hours]
Part 1 of full time, supervised classroom teaching; for LAMP middle childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6210 with a minimum grade of C or CI 6220 with a minimum grade of C or CI 6230 with a minimum grade of C or CI 6240 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CI 6260 Internship/Student Teaching in Social Studies
[4 credit hours]
Part 1 of full time, supervised classroom teaching; for LAMP middle childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6210 with a minimum grade of C or CI 6220 with a minimum grade of C or CI 6230 with a minimum grade of C or CI 6240 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CI 6270 Internship/Student Teaching in Mathematics
[4 credit hours]
Part 1 of full time, supervised classroom teaching; for LAMP middle childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6210 with a minimum grade of C or CI 6220 with a minimum grade of C or CI 6230 with a minimum grade of C or CI 6240 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CI 6280 Internship/Student Teaching in Science
[4 credit hours]
Part 1 of full time, supervised classroom teaching; for LAMP middle childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6210 with a minimum grade of C or CI 6220 with a minimum grade of C or CI 6230 with a minimum grade of C or CI 6240 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CI 6300 Seminar in Student Teaching
[1 credit hour]
This seminar course meets throughout the semester along with the student teaching internship to provide discussion and guidance for the LAMP student teaching experience.
Corequisites: CI 6250, CI 6260, CI 6270, CI 6280, CI 6320, CIEC 6940, SPED 6330
Term Offered: Spring

CI 6310 Practicum in Teaching Foreign Language
[1 credit hour]
Initial field experience for LAMP Middle Childhood and Adolescent to Young Adult licensure only; experiences include focused observations in classroom settings, co-teaching with a mentor teacher, and the design, planning, and teaching of units that integrate Foreign Language.
Corequisites: SPAN 5120
Term Offered: Fall

CI 6320 Internship/Student Teaching in Foreign Language
[4 credit hours]
Part 1 of full time, supervised classroom teaching; for LAMP middle childhood and AYA licensure only. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6310 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

CI 6370 Fundamentals Of Grant Writing
[3 credit hours]
This seminar teaches participants about fundamentals of grant writing. Topics covered include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.
Term Offered: Spring, Summer

CI 6400 Trends In Literacy Acquisition
[3 credit hours]
Study of the theories and foundational components of literacy acquisition and instruction aligned with the Science of Reading. Issues for learners from diverse backgrounds including English Language Learners and those who have dyslexia are examined.
Term Offered: Fall

CI 6410 Content Area Literacy
[3 credit hours]
Study of the integration of reading and writing in the content areas. Attention to both content area literacy approaches and disciplinary literacy practices. Consideration of needs of diverse learners including English Language Learners.
Term Offered: Spring, Summer, Fall

CI 6430 Diagnosis Of Reading Disability
[3 credit hours]
Teachers acquire the knowledge and skills needed to assess the reading and writing of students and to plan appropriate instruction. Emphasis on phonemic awareness, concepts of print, word recognition, fluency, comprehension, word study, and writing.
Prerequisites: CI 6400 with a minimum grade of C
Term Offered: Spring, Summer, Fall

CI 6440 Remediation Practicum
[3 credit hours]
In this course, participants engage in systematic, explicit and evidence-based literacy tutoring of learners across K#12 grades. Additionally, participants engage in the planning and enactment of professional development with other educators related to the conduct of remedial tutoring.
Prerequisites: (CI 6400 with a minimum grade of C and CI 6430 with a minimum grade of C)
Term Offered: Spring

CI 6490 Theory And Research In Literacy
[3 credit hours]
Extensive examination of current research and theoretical considerations in language and literacy learning and instruction. Contemporary contextual factors such as policy and standards are explored. The reciprocal nature of research and practice is a central theme of the course. Individualized culminating projects focus on specific issues of interest related to language and literacy learning and instruction.
Term Offered: Spring, Summer, Fall

CI 6590 Theory And Research In Mathematics Education
[3 credit hours]
Critical appraisal of current theory and research in mathematics education. Emphasis on issues related to teacher practice, student learning, and curriculum development.
Term Offered: Spring, Summer, Fall

CI 6650 Teacher Learning and Education
[3 credit hours]
Designed for future teacher educators and teacher leaders, students investigate frameworks for teacher professional knowledge including pedagogical content knowledge, teacher learning, educative mentoring, and program design. Teacher educators' roles as leaders for teacher learning and improvement are examined.

CI 6690 Theory And Research In Science Education
[3 credit hours]
Designed for individuals beginning their thesis, project, or seminar paper phase of their graduate program, this course explores both theory and research in science education. Based on an area of interest, students review and critically analyze the research literature in science education. Students also learn how to find primary sources, read and critique research, and organize and write a literature review.
Term Offered: Spring, Summer, Fall

CI 6730 Curriculum, Assessment, and Instruction
[3 credit hours]
In this course, students explore the connection between state standards, objectives, assessment, and instruction. This course would be designed for students who are in the classroom or have some exposure to K-12 classrooms. This course is a deep dive into backwards planning, choosing standards, developing assessments, and a focus on instruction.
Term Offered: Spring

CI 6790 Theory And Research In Social Studies
[3 credit hours]
Intensive study of research and theoretical considerations related to the development and current status of learning and instruction in the social studies. Historical and contemporary contextual factors such as policy and standards are explored. The reciprocal nature of research and practice is a central theme of the course. Individualized culminating projects focus on issues related to learning and instruction in the social studies.
Term Offered: Spring, Fall

CI 6800 Foundations Of Curriculum & Instruction
[3 credit hours]
The purpose of CI 6800/8800, Foundations of Curriculum, is to provide an introduction to the foundational areas that affect the design and development of curriculum. This includes the history, social forces, philosophy, and psychology behind many of the curriculum practices and issues that exist in schools today as well as the nature of the curriculum development process. As a result, the course is designed to increase the learner's awareness of the field of curriculum and to introduce specific skills in design and development.
Term Offered: Summer, Fall

CI 6810 Curriculum Development: K-12
[3 credit hours]
The purpose of CI 6810/8810, Curriculum Development: K-12, is to provide appropriate background information and practice in curriculum and instructional design and direct experiences in approaching this process imaginatively. The course will focus on how to use both traditional and emerging models of curriculum design and development to create a working curriculum and to design instructional based on research-based theories of learning and models of teaching.
Term Offered: Spring, Fall

CI 6830 Curriculum Trends And Issues
[3 credit hours]
Designed for advanced students of education, this course guides students in exploring core ideas to develop a framework for the study of teaching. Students investigate issues of what and how to teach in the content areas as well as explore the knowledge of expert content teachers. As a core graduate course in curriculum and instruction, students analyze and integrate ideas to form a theoretical framework and are guided in developing professional written work grounded in the literature. Students explore questions and approaches for research on content teaching.
Term Offered: Spring, Summer, Fall

CI 6840 Curriculum For Educational Leaders
[3 credit hours]
The purpose of this course is to introduce educational leaders to research-based leadership theories and principles and how these apply to P-12 school settings. Building principals, teacher leaders, and instructional coaches will focus on creating learning environments throughout the school that increase teacher effectiveness, utilize alternative assessment strategies, and focus on connecting curriculum, instruction and assessment in all classrooms.
Term Offered: Spring, Fall

CI 6890 Theory and Research in Learning and Teaching Content
[3 credit hours]
A critical analysis of the research literature in language arts, mathematics, science, or social studies education. Students examine educational research regarding ideas about learning and teaching that influence research, finding primary sources, reading and critiquing research, and organizing and writing a literature review.
Term Offered: Spring, Summer, Fall

CI 6900 Master's Culminating Seminar In Teacher Education
[1-3 credit hours]
This seminar is the master's culminating experience for students studying teaching and learning. This course is completed in three stages with a focus on the preparation and submission of a professional manuscript for publication in Learning to Teach Language Arts, Mathematics, Science, and Social Studies Through Research and Practice. Students identify a problem for practice, review professional resources, and present well-formed message orally and in writing.
Term Offered: Spring, Summer, Fall

CI 6920 Masters Research Project In Curriculum And Instruction
[1-3 credit hours]
Students will complete an individual research project under the direction of a committee of at least two faculty members in Curriculum and Instruction, ordinarily including the faculty adviser.
Term Offered: Spring, Summer, Fall

CI 6950 Internship Capstone
[1 credit hour]
Part 2 of full time, supervised classroom teaching; for LAMP middle childhood and Adolescent to Young Adult licensure only; added emphasis on continual professional growth and development as educators. Admission to SECE or MIDD LAMP program required.
Prerequisites: CI 6250 with a minimum grade of C or CI 6260 with a minimum grade of C or CI 6270 with a minimum grade of C or CI 6280 with a minimum grade of C or CI 6320 with a minimum grade of C
Term Offered: Spring, Summer, Fall

CI 6960 Masters Thesis In Curriculum And Instruction
[1-3 credit hours]
Students will complete a thesis under the direction of committee of at least two faculty members from Curriculum and Instruction, ordinarily including the faculty adviser.
Term Offered: Spring, Summer, Fall

CI 7940 Specialist Practicum In Curriculum And Instruction
[1-3 credit hours]
Observation and supervised experience in an appropriate setting. This experience may be in a school or other educational setting. Student will study under the supervision of appropriate mentors or advisors.
Term Offered: Spring, Summer, Fall

CI 7980 Special Topics In Curriculum & Instruction
[1-5 credit hours]
A course developed around topics of interest and concern to educators.
Term Offered: Spring, Summer, Fall

CI 8370 Fundamentals Of Grant Writing
[3 credit hours]
This seminar teaches participants about fundamentals of grant writing. Topics covered include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.
Term Offered: Spring, Summer

CI 8400 Trends In Literacy Acquisition
[3 credit hours]
Study of the theories and foundational components of literacy acquisition and instruction aligned with the Science of Reading. Issues for learners from diverse backgrounds including English Language Learners and those who have dyslexia are examined.
Term Offered: Fall

CI 8410 Content Area Literacy
[3 credit hours]
Study of the integration of reading and writing in the content areas. Attention to both content area literacy approaches and disciplinary literacy practices. Consideration of needs of diverse learners including English Language Learners.
Term Offered: Spring, Summer, Fall

CI 8430 Diagnosis Of Reading Disability
[3 credit hours]
Teachers acquire the knowledge and skills needed to assess the reading and writing of students and to plan appropriate instruction. Emphasis on phonemic awareness, concepts of print, word recognition, fluency, comprehension, word study, and writing.
Prerequisites: CI 6400 with a minimum grade of C
Term Offered: Spring, Summer, Fall

CI 8440 Remediation Practicum
[3 credit hours]
In this course, participants engage in systematic, explicit and evidence-based literacy tutoring of learners across K#12 grades. Additionally, participants engage in the planning and enactment of professional development with other educators related to the conduct of remedial tutoring.
Prerequisites: (CI 6400 with a minimum grade of C and CI 6430 with a minimum grade of C)
Term Offered: Spring

CI 8490 Theory And Research In Literacy
[3 credit hours]
Extensive examination of current research and theoretical considerations in language and literacy learning and instruction. Contemporary contextual factors such as policy and standards are explored. The reciprocal nature of research and practice is a central theme of the course. Individualized culminating projects focus on specific issues of interest related to language and literacy learning and instruction.
Term Offered: Spring, Summer, Fall

CI 8590 Theory And Research In Mathematics Education
[3 credit hours]
Critical appraisal of current theory and research in mathematics education. Emphasis on issues related to teacher practice, student learning, and curriculum development.
Term Offered: Spring, Summer, Fall

CI 8650 Teacher Learning and Education
[3 credit hours]
Designed for future teacher educators and teacher leaders, students investigate frameworks for teacher professional knowledge including pedagogical content knowledge, teacher learning, educative mentoring, and program design. Teacher educators' roles as leaders for teacher learning and improvement are examined.

CI 8690 Theory And Research In Science Education
[3 credit hours]
Designed for individuals beginning their thesis, project, or seminar paper phase of their graduate program, this course explores both theory and research in science education. Based on an area of interest, students review and critically analyze the research literature in science education. Students also learn how to find primary sources, read and critique research, and organize and write a literature review.
Term Offered: Spring, Summer, Fall

CI 8700 Doctoral Pro-Seminar I: Introduction to Scholarship in Curriculum and Instruction
[3 credit hours]
The doctoral research cycle begins by introducing students to issues in curriculum and instruction, establishing a research agenda, and building a community of scholars. Pre-requisite to Pro-Seminar II.
Term Offered: Spring, Fall

CI 8710 Doctoral Pro-Seminar II: Themes in theory and research in Curriculum and Instruction
[3 credit hours]
The doctoral research cycle continues by examining the paradigmatic and theoretical bases of C&I research. Develop lines of inquiry grounded in theoretical knowledge and personal interests. Prerequisite: Pro-Seminar I.
Prerequisites: CI 8700 with a minimum grade of D-
Term Offered: Spring, Summer

CI 8720 Doctoral Pro-Seminar III: Themes in theory and research in curriculum and instruction.
[3 credit hours]
The doctoral research cycle is completed. A study is designed, conducted and disseminated within a research group under the guidance of a mentor. Prerequisite: CI 8700 + 8710.
Prerequisites: CI 8710 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

CI 8790 Theory And Research In Social Studies
[3 credit hours]
Intensive study of research and theoretical considerations related to the development and current status of learning and instruction in the social studies. Historical and contemporary contextual factors such as policy and standards are explored. The reciprocal nature of research and practice is a central theme of the course. Individualized culminating projects focus on issues related to learning and instruction in the social studies.
Term Offered: Spring, Fall

CI 8800 Foundations Of Curriculum & Instruction
[3 credit hours]
The purpose of CI 6800/8800, Foundations of Curriculum, is to provide an introduction to the foundational areas that affect the design and development of curriculum. This includes the history, social forces, philosophy, and psychology behind many of the curriculum practices and issues that exist in schools today as well as the nature of the curriculum development process. As a result, the course is designed to increase the learner's awareness of the field of curriculum and to introduce specific skills in design and development.
Term Offered: Spring, Summer, Fall

CI 8810 Curriculum Development: K-12
[3 credit hours]
The purpose of CI 6810/8810, Curriculum Development: K-12, is to provide appropriate background information and practice in curriculum and instructional design and direct experiences in approaching this process imaginatively. The course will focus on how to use both traditional and emerging models of curriculum design and development to create a working curriculum and to design instructional based on research-based theories of learning and models of teaching.
Term Offered: Spring, Fall

CI 8830 Curriculum Trends And Issues
[3 credit hours]
Designed for advanced students of education, this course guides students in exploring core ideas to develop a framework for the study of teaching. Students investigate issues of what and how to teach in the content areas as well as explore the knowledge of expert content teachers. As a core graduate course in curriculum and instruction, students analyze and integrate ideas to form a theoretical framework and are guided in developing professional written work grounded in the literature. Students explore questions and approaches for research on content teaching.
Term Offered: Spring, Summer, Fall

CI 8840 Curriculum For Educational Leaders
[3 credit hours]
The purpose of this course is to introduce educational leaders to research-based leadership theories and principles and how these apply to P-12 school settings. Building principals, teacher leaders, and instructional coaches will focus on creating learning environments throughout the school that increase teacher effectiveness, utilize alternative assessment strategies, and focus on connecting curriculum, instruction and assessment in all classrooms.
Term Offered: Spring, Fall

CI 8860 Advanced Curriculum Theory
[3 credit hours]
This course is designed to build on the foundational concepts and principles introduced in CI 6800/8800 and to explore, analyze and evaluate curriculum theory as it applies to curriculum studies as a discipline. This course will explore curriculum theory as a "complicated conversation" led by educators with the knowledge of contemporary social issues, history, philosophy and popular culture. The course will analyze and evaluate modernist and postmodern theories and practices and engage students with readings, discussions, and interactions with influential curriculum theorists.
Term Offered: Spring, Fall

CI 8900 Doctoral Seminar In Curriculum And Instruction
[2-4 credit hours]
This seminar will consider problems and provide advanced study for doctoral students in Curriculum and Instruction.
Term Offered: Spring, Summer, Fall

CI 8930 Independent Research In Curriculum And Instruction
[1-5 credit hours]
Individual study is designed to provide the doctoral student opportunity to work individually on professional problems under the direction of CI faculty.
Term Offered: Spring, Summer, Fall

CI 8940 Doctoral Internship In Curriculum And Instruction
[1-3 credit hours]
Placement of doctoral students in appropriate school, school district, or other professional setting under direction of appropriate mentors or advisors.
Term Offered: Spring, Fall

CI 8960 Dissertation In Curriculum And Instruction
[1-10 credit hours]
Original research in an area of curriculum and instruction.
Term Offered: Spring, Summer, Fall

Cyber Security (CYBR)

CYBR 5930 Cyber Security Seminar
[0 credit hours]
All graduate students in the Master of Science in Cyber Security program are expected to attend the seminar each semester and to keep a journal of ideas, questions, and other items that may benefit their research. Students will also present their thesis and project results in the seminar.
Term Offered: Spring, Fall

CYBR 6800 Experiential Learning in Cyber Security
[3 credit hours]
This course will discuss advanced topics in computer and network security. It will revisit the foundation of cyber security, and then discuss recent attacks, analyze attack trends, and on-going activities in a number of emerging areas in cyber security. Students will also have the opportunities to learn real-world attacks and defenses through the UT Cyber Range infrastructure with the guidance from IT security team at UT.
Prerequisites: EECS 5640 with a minimum grade of D- and EECS 5720 with a minimum grade of D- and EECS 5790 with a minimum grade of D-
Term Offered: Fall

CYBR 6920 Cyber Security Project
[1-6 credit hours]
Intensive discipline specific study in cyber security for the project option, may include theoretical and experimental work. This course may be repeated for credit for up to 6 credit hours. The exact topic will be agreed upon mutually after discussion between the instructor and the student.
Term Offered: Spring, Summer, Fall

CYBR 6960 Cyber Security Research and Thesis
[1-9 credit hours]
Intensive discipline specific study in cyber security, including theoretical and experimental work. This course may be repeated for credit with minimum 9 cr hr required for the MS thesis. The exact topic will be agreed upon mutually after discussion between the instructor and the student.
Term Offered: Spring, Summer, Fall

CYBR 6970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Master's degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

CYBR 6990 Independent Study in Cyber Security
[1-3 credit hours]
Intensive discipline specific study in cyber security up to 3 hours, may include theoretical and experimental work. This course may be repeated for credit. The exact topic will be agreed upon mutually after discussion between the instructor and the student.
Term Offered: Spring, Summer, Fall

Dentistry - Oral Biology (DENT)

DENT 6010 Growth and Development
[0.5 credit hours]
Presentation and discussion of key growth and development concepts related to orthodontic/orthopedic diagnosis and treatment in pediatric dentistry including: Orthodontic Records, Growth and Development of the Face and Dental Arches, Cephalometrics and Facial Esthetics, Orthodontic Diagnosis and Treatment in the Mixed Dentition, Management of the Developing Occlusion, Case Selection.
Term Offered: Fall

DENT 6020 Pharmacology 1
[0.5 credit hours]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, efxpected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Summer, Fall

DENT 6030 Dento-Alveolar Trauma I
[0.5 credit hours]

DENT 6040 Conscious Sedation I
[2 credit hours]
In depth discussion of the principles and objectives of conscious sedation, deep sedation and general anesthesia as behavior management techniques, including indications and contraindications for their use.
Term Offered: Summer, Fall

DENT 6050 Clinical Pediatric Dentistry
[0.5-1 credit hours]
In depth analysis of the scientific principles underlying the contemporary practice of pediatric dentistry, including the prevention of disease, dental anomalies, habits and other problems in occlusal development, and CAN.
Term Offered: Spring, Summer, Fall

DENT 6060 Principles of Behav/Comm Mgmt
[2 credit hours]
Critical analysis of historical behavior management and communication techniques and currently accepted behavior management techniques and utilization of techniques based upon patient age, cognitive development, behavior, medical history, parental concerns, and patient response to management techniques.
Term Offered: Summer, Fall

DENT 6070 Pediatric Dentistry Literature
[0.5 credit hours]
Presentation and discussion of selected articles related to the field of pediatric dentistry and other health related topics.
Term Offered: Spring, Summer, Fall

DENT 6080 Anatomy & Embryology Head/Neck
[1 credit hour]
Lecture and discussion of select topics in gross anatomy and embryology.
Term Offered: Spring

DENT 6090 Concepts - Dental Microbiology
[0.5 credit hours]

DENT 6100 Pediatric Medicine Lecture
[2 credit hours]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, efxpected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Spring, Summer, Fall

DENT 6110 Oral Health Policies
[2 credit hours]

DENT 6120 Pharmacology II
[0.5 credit hours]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, efxpected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Spring

DENT 6130 Dento-alveolar Trauma II
[0.5 credit hours]

DENT 6140 Conscious Sedation II
[2 credit hours]
In depth discussion of the principles and objectives of conscious sedation, deep sedation and general anesthesia as behavior management techniques, including indications and contraindications for their use.
Term Offered: Spring, Summer

DENT 6150 Amer Board of Pediaric Dent RE
[2 credit hours]

DENT 6160 Special Care Dentistry
[1 credit hour]
In depth discussion of medical and handicapping conditions that require modifications in the delivery of dental services to infants, children and adolescents. Topics to be covered include, but are not limited to: bleeding disorders, cardiovascular disease, complications of chemotherapy and radiation therapy, diabetes, developmental disabilities, hemaglobinopathies, hematopoetic cell transplantation, hematologic malignancies, infectious diseases, neurologic disorders, organ transplantation, respiratory diseases, sensory impairments, solid tumors, common pediatric syndromes.
Term Offered: Fall

DENT 6170 Clinical Pediatric Dent Clinic
[1-10 credit hours]
Observation and participation in the care of patients with preventive, restorative, surgical, orthodontic and prosthetic care within the Dentistry Clinic.
Term Offered: Spring, Summer, Fall

DENT 6200 Oral Pathology
[1 credit hour]
In depth discussion of the epidemiology, pathogenesis, clinical characteristics, diagnostic methods, formulation of differential diagnoses, and management of oral and perioral lesions and anomalies with emphasis on the infant child and adolescent.
Term Offered: Spring, Summer

DENT 6210 Endodontics
[0-2 credit hours]
Presentation and discussion of key elements of endodontics. The course will discuss: the pathology of dental pulp and periapical diseases, how to diagnosis and treatment plan for endodontic procedures. Isolation methods, endodontic access and length determination with proper x-ray methods will be discussed. Materials and Armamentarium will be considered for preparing, obturation, temporization and completion of the endodontic procedures.
Term Offered: Spring, Summer, Fall

DENT 6220 Operative Dentistry
[0-2 credit hours]
Presentation and discussion of key elements of Art and Science of operative dentistry related to dental material and tooth preparation. The course will discuss the clinical significance of Dental Anatomy, Histology, Physiology and occlusion. The materials to be examined will include amalgam restoration, composite restoration and cast metal and porcelain type restorations.
Term Offered: Spring, Summer, Fall

DENT 6230 Dental Occlusion
[0-2 credit hours]
Presentation and discussion of key elements of dental occlusion related to muscles of mastication, the TMJ and jaw relations including centric and protrusive positions. With various interocclusal records, stone models will be mounted on an articulator using a face bow to duplicate Jaw relation and the occlusal position of the subject patient. Then equilibrate the models into a centric relation.
Term Offered: Spring, Summer, Fall

DENT 6240 Dentures
[0-2 credit hours]
Presentation and discussion of key elements of the principles partial and complete dentures fabrication. Areas of concentration will be proper evaluation of the patients' needs and wants, comprehensive diagnosis, making impressions, recording the inter maxillary/mandibular space, neutral zone, initial tooth, the dress rehearsal, and delivery plus follow up equilibration. Developing expertise in finding centric and protrusive positions and mounting models on an articulator using a face bow.
Term Offered: Spring, Summer, Fall

DENT 6250 General Dentistry Literature Review
[2 credit hours]
Presentation and discussion of selected articles related to the field of General Dentistry and other health related fields.
Term Offered: Spring, Summer, Fall

DENT 6260 Clinical General Dentistry Dental Clinic
[2 credit hours]
The General Practice Resident will participate in the direct care of dentistry patients in the outpatient dental facility in the UTMC or Toledo Hospital dental clinic.
Term Offered: Spring, Summer, Fall

Disability Studies (DST)

DST 5980 Special Topics in Disability Studies
[1-4 credit hours]
Special topics in Disability Studies. Topics vary by instructor; may be repeated in different specialized topics.
Term Offered: Spring, Summer, Fall

DST 6000 Disability Studies in Theory and Practice
[3 credit hours]
This course provides students with an introduction to the core theories and practices of Disability Studies, including critical approaches to defining disability, the social and political dimensions of disability, ethics in disability-related research, and key debates in the field. This course is a gateway course for graduate students on the topic of Disability Studies.
Term Offered: Spring, Summer, Fall

DST 6200 Representations of Disability and the Rise of Disability Culture
[3 credit hours]
This course examines representations of disability in mass media and explores the rise of disability culture.
Term Offered: Spring, Fall

DST 6400 Disability History and Rights
[3 credit hours]
This course examines the history of the lived experiences of people defined as disabled as well the concept of disability. Furthermore we will explore the development of disability as an issue of rights, and consider how disability rights impact each students' professional and civic lives.
Term Offered: Summer, Fall

DST 6600 Disability Ethics and Policy
[3 credit hours]
This course investigates contemporary questions in disability policy and ethics, addressing historical and contemporary policy initiatives, political philosophy of disability, and the relationship of Disability Studies to medical ethics and bioethics. Students will pursue their own research interests while applying fundamental concepts from Disability Studies to address disability justice issues.
Term Offered: Spring, Summer, Fall

DST 6980 Independent Study in Disability Studies
[1-4 credit hours]
Directed study of a current topic in Disability Studies under the direction of Disability Studies faculty. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Summer, Fall

Earth Ecology and Environmental Science (EEES)

EEES 5100 Advanced Glacial and Quaternary Geology
[3 credit hours]
To provide broad geologic understanding of cyclical events including glaciation, sea level, and ice sheet paleogeography during the Quaternary Period. Also, to provide detailed geologic understanding of what a glacier is and how it shapes the landscape. Specific topics will include mass balance, ice flow, hydrology, erosion, deposition, resultant landforms, glacial lake environments, and development of the regional glacial landscape. A field trip is mandatory.
Term Offered: Spring

EEES 5150 Organic Evolution
[3 credit hours]
The modern theory of evolution is presented within a general framework of biological and geological evidence focusing on the fossil record, early biomolecules, protein synthesis, genetics, phylogeny and vertebrate evolution.
Term Offered: Spring, Summer

EEES 5160 Advanced Environmental Data Management and Visualization
[3 credit hours]
A course in data management for environmental science graduate students covering the basics of data management practices and using Excel and R for data preparation, evaluation, analysis, visualization, and interpretation.
Term Offered: Fall

EEES 5220 Environmental Geochemistry
[3 credit hours]
Chemical reactions of environmental concern. Water and soil chemistry related to contaminant fate and mobility. Computer software used.
Term Offered: Spring

EEES 5240 Soil Science
[3 credit hours]
Basic principles of soil formation of physics, chemistry and biology with emphasis on their influence on fluid and chemical migration and preservation of soil quality from geological, agricultural and environmental perspectives.
Term Offered: Spring, Fall

EEES 5350 Ecology and Conservation of Reptiles and Amphibians
[3 credit hours]
Ecology, diversity, evolution, and conservation of amphibians and reptiles. Lectures will discuss natural history, trait diversity, evolutionary context, and ecological implications of amphibians and reptiles. Hands-on activities will include taxonomy and identification of local species, survey and field methods, and discussions of scientific literature. Throughout this course, the biology of amphibians and reptiles will be emphasized in the context of conservation.
Term Offered: Spring

EEES 5410 Hydrogeology
[3 credit hours]
Fundamentals of groundwater/earth interactions are introduced concentrating on physical aspects of groundwater flow with applications to the field of water resources and contaminant investigations.
This course is designed as the fundamental course in groundwater for students who plan to use hydrogeology in their careers, e.g., environmental geologists, civil and environmental engineers, environmental specialists and scientists, and petroleum geologists.
Prerequisites: MATH 1750 with a minimum grade of D- or MATH 1850 with a minimum grade of D- or MATH 1830 with a minimum grade of D- or MATH 1920 with a minimum grade of D-
Term Offered: Spring

EEES 5480 GIS Applications in ENSC
[3 credit hours]
An applications course focused on using GIS techniques and applications in environmental problems and research.
Term Offered: Fall

EEES 5490 Remote Sensing of the Environment
[4 credit hours]
Introduction to theory, methods and techniques used to gather and analyze remote sensor data. Topics range from low altitude air photo interpretation through satellite image acquisition.
Prerequisites: GEPL 3550 with a minimum grade of D- and EEES 2100 with a minimum grade of D-
Term Offered: Fall

EEES 5600 Oceanography
[3 credit hours]
An exploration of the geological, physical, chemical and biological nature of the oceans. Emphasis on the origin and evolution of ocean basins, plate tectonics, properties of seawater, and physical processes of circulation, especially as related to climate, the hydrologic cycle, and life in the oceans.
Prerequisites: (EEES 2100 (may be taken concurrently) with a minimum grade of C- or EEES 1010 (may be taken concurrently) with a minimum grade of C-) and (MATH 1210 (may be taken concurrently) with a minimum grade of C- or MATH 1320 (may be taken concurrently) with a minimum grade of C- or MATH 1340 (may be taken concurrently) with a minimum grade of C-)
Term Offered: Spring

EEES 5610 Environmental Geophysics
[3 credit hours]
An introduction to basic geophysical concepts, signals, and information content. Course includes an overview of the theory, field application, and interpretation of geophysical methods. Discussion of the applications for characterizing and monitoring environmental systems, including soils, groundwater, and other ecosystem units. Case studies include the use of geophysics for soil, groundwater, archaeological, forensic, engineering, and ecological investigations. The course involves field demonstrations and hands-on exercises on field applications of geophysical techniques.
Prerequisites: (PHYS 2070 with a minimum grade of D- and PHYS 2080 with a minimum grade of D- and MATH 1850 with a minimum grade of D- and MATH 1860 with a minimum grade of D-)
Term Offered: Spring

EEES 5650 Advanced Geology Field Studies
[1-4 credit hours]
Intensive field studies to various areas of geologic interest. Studies may involve various geologic field methods and descriptive techniques. Course may be repeated multiple times. Fall and Spring.

EEES 5730 Advanced Aquatic Ecology
[3 credit hours]
Advanced cross-disciplinary concepts in the ecology of aquatic environments emphasizing the biology of populations, communities and ecosystems. Includes a project on the application of principles and theory to help understand and solve a management problem in aquatic systems.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Fall

EEES 5740 Advanced Aquatic Ecology Laboratory
[1 credit hour]
Laboratory exercises on the biology of aquatic populations, communities and ecosystems.
Corequisites: EEES 5730
Term Offered: Fall

EEES 5750 Advanced Conservation Biology
[4 credit hours]
Advanced cross-disciplinary concepts in the application of principles and theory to the study and maintenance of biological diversity in temperate, subtropical and tropical systems. Lectures, classroom discussion and readings.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Spring

EEES 5760 Advanced Landscape Ecology
[3 credit hours]
This course is for graduate students from a variety of disciplines. Emphasis will be placed on up-to-date knowledge and methods in landscape analysis, pattern-process relationship and potential management applications at multiple spatial and temporal scales.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Spring, Fall

EEES 5790 Ecology Field Study
[2-4 credit hours]
Field study of globally significant ecosystem(s), including analysis of structural and functional relationships within and between ecosystems. Opportunities for individual student projects.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Spring, Summer

EEES 6100 Glacial Stratigraphy And Geophysics
[3 credit hours]
To integrate glacial sedimentology and stratigraphy, with near-surface, geophysical methodologies. Field work to collect a variety of field data to analyze in the lab is mandatory. Data to be presented as posters.
Term Offered: Fall

EEES 6250 Graduate Launch
[1 credit hour]
This course prepares graduate students for success by preparing individual study plans, research proposals and presentations, and launching bibliographic research.
Term Offered: Spring, Fall

EEES 6300 Integrated Environmental & Earth Systems
[3 credit hours]
Fundamental concepts in environmental science explored through relationships in the integrated earth system.
Term Offered: Spring, Fall

EEES 6400 Environmental Statistics
[4 credit hours]
Applied statistics (model formulation, parameter estimation, and model evaluation) for environmental and ecological data analysis.
Prerequisites: EEES 4160 with a minimum grade of C- or EEES 5160 with a minimum grade of C-
Term Offered: Spring

EEES 6440 Contaminant Hydrogeology
[3 credit hours]
Groundwater contaminant sources, impacts, transport, geochemistry and remediation in relation to geological environments with attention to sampling, detection, characterization, modeling and aquifer protection.
Prerequisites: EEES 5410 with a minimum grade of D-

EEES 6450 Advanced Applied Hydrogeology
[3 credit hours]
Applications of hydrogeological monitoring, analyses and modeling using mathematics, statistics and computers. Subjects include: well field and pump test design, sampling strategies, data presentation and analysis and modeling fundamentals.
Prerequisites: EEES 5410 with a minimum grade of C
Term Offered: Spring

EEES 6600 Foundations of Ecology
[3 credit hours]
This course is a thorough review of ecological concepts for graduate students including workshops exploring classic quantitative models in ecology.
Term Offered: Spring, Fall

EEES 6650 Statistical Modeling in Environmental Sciences
[4 credit hours]
Statistical modeling techniques applied to environmental problems, with an emphasis on multilevel modeling.
Prerequisites: EEES 6400 with a minimum grade of D-
Term Offered: Spring

EEES 6810 Writing For The Environmental Sciences
[3 credit hours]
Learn to write papers that get cited and proposals that get funded. This course focuses on building the fundamental skills required for effective scientific writing. Writing exercises focus on improving the clarity and persuasiveness of student theses, manuscripts, and proposals. This course is for anyone who wants to improve their science writing, is writing theses or proposals, or who may have to write on the job.

EEES 6930 Seminar
[1 credit hour]
Individual presentation and discussion of papers in the environmental sciences.
Term Offered: Spring, Fall

EEES 6960 Thesis Research
[1-15 credit hours]
Research on a particular geologic problem leading to a written thesis which must be presented and defended before a faculty committee.
Term Offered: Spring, Summer, Fall

EEES 6980 Special Topics
[1-4 credit hours]
A graduate course covering some aspect of environmental sciences not covered in the formal graduate curriculum. Students may repeat the course for credit as topics vary.
Term Offered: Spring, Summer, Fall

EEES 6990 Independent Study
[1-4 credit hours]
Student selects an approved subject for individual study and prepares a detailed report, or gives equivalent evidence of mastering of the selected subject. Taken only as S/U.
Term Offered: Spring, Summer, Fall

EEES 7730 Advanced Aquatic Ecology
[3 credit hours]
Advanced cross-disciplinary concepts in the ecology of aquatic environments emphasizing the biology of populations, communities and ecosystems. Includes a project on the application of principles and theory to help understand and solve a management problem in aquatic systems.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Fall

EEES 7790 Ecology Field Trip
[2-4 credit hours]
Field study of globally significant ecosustem(s), including analysis of structural and functional relationships within and between ecosystems. Opportunities for individual student projects.
Prerequisites: EEES 3050 with a minimum grade of D-
Term Offered: Spring, Summer

EEES 8250 Graduate Launch
[1 credit hour]
This course prepares graduate students for success by preparing individual study plans, research proposals and presentations, and launching bibliographic research.
Term Offered: Spring, Fall

EEES 8300 Integrated Environmental & Earth Systems
[3 credit hours]
Fundamental concepts in environmental science explored through relationships in the integrated earth system.
Term Offered: Spring, Fall

EEES 8400 Environmental Statistics
[4 credit hours]
Applied statistics (model formulation, parameter estimation, and model evaluation) for environmental and ecological data analysis.
Prerequisites: EEES 4160 with a minimum grade of C- or EEES 5160 with a minimum grade of C-
Term Offered: Spring

EEES 8600 Foundations of Ecology
[3 credit hours]
This course is a thorough review of ecological concepts for graduate students including workshops exploring classic quantitative models in ecology.
Term Offered: Spring, Fall

EEES 8650 Statistical Modeling in Environmental Sciences
[4 credit hours]
Statistical modeling techniques applied to environmental problems, with an emphasis on multilevel modeling.
Prerequisites: EEES 6400 with a minimum grade of D- or EEES 8400 with a minimum grade of D-
Term Offered: Spring, Fall

EEES 8810 Writing For The Environmental Sciences
[3 credit hours]
Learn to write papers that get cited and proposals that get funded. This course focuses on building the fundamental skills required for effective scientific writing. Writing exercises focus on improving the clarity and persuasiveness of student theses, manuscripts, and proposals. This course is for anyone who wants to improve their science writing, is writing theses or proposals, or who may have to write on the job.

EEES 8930 Seminar In Ecology
[1 credit hour]
Presentation on research or current literature by graduate doctoral students, faculty or guest speakers.
Term Offered: Spring, Fall

EEES 8960 Doctoral Dissertation Research
[1-15 credit hours]
Research on a particular problem leading a written dissertation that must be presented and defended before a faculty committee.
Term Offered: Spring, Summer, Fall

EEES 8980 Advanced Topics In Ecology
[2-4 credit hours]
Course covering some aspect of ecology not covered in the formal graduate curriculum. Students may repeat the course for different topics.
Term Offered: Spring, Summer, Fall

EEES 8990 Advanced Readings In Ecology
[1-4 credit hours]
Faculty-directed readings or projects in a specific area of ecology. Students may repeat the course for different topics.
Term Offered: Spring, Summer, Fall

Economics (ECON)

ECON 5050 Population Economics
[4 credit hours]
Interaction of economic changes and demographic variables; topics include birth rates, women's employment, marriage and divorce, aging and mortality, migration and overpopulation.
Prerequisites: (ECON 1150 (may be taken concurrently) with a minimum grade of D- or ECON 1200 (may be taken concurrently) with a minimum grade of D-) and ECON 2810 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Fall

ECON 5120 Monetary Theory
[4 credit hours]
Modern theories of financial markets, money and the theory of interest rates, money's role in general equilibrium and growth models and money's ability to cause inflation.
Prerequisites: ECON 2120 with a minimum grade of D- or ECON 3120 with a minimum grade of D- or ECON 3150 with a minimum grade of D-
Term Offered: Spring

ECON 5130 Monetary And Fiscal Policy
[3 credit hours]
Changes in the quantity of money and alternative government spending, taxation and debt policies, interrelations of fiscal and monetary policies in stabilization programs.
Prerequisites: ECON 3150 with a minimum grade of D- or ECON 4120 with a minimum grade of D-
Term Offered: Spring

ECON 5150 Advanced Macroeconomic Theory
[4 credit hours]
Theories of consumption and investment. Empirical estimates. Cycle and growth theory, multiplier-accelerator analysis and growth models. The theory and instruments of macroeconomic policy. Dynamic Macroeconomic Theory.
Prerequisites: ECON 3150 with a minimum grade of D-
Term Offered: Fall

ECON 5200 Advanced Microeconomic Theory
[4 credit hours]
Advanced topics in microeconomic theory, consumer behavior, the firm and market structure, distribution theory, equilibrium conditions, welfare economics.
Prerequisites: ECON 3200 with a minimum grade of D-
Term Offered: Fall

ECON 5240 Applied Environmental Economics
[3 credit hours]
The economics of the environment and natural resources using applied welfare theory, benefit-cost analyses, and nonmarket valuation. Examination of economic instruments, such as marketable permits, for solving environmental problems.
Prerequisites: ECON 1200 with a minimum grade of D- or ECON 3240 with a minimum grade of D- or ECON 3270 with a minimum grade of D-
Term Offered: Spring

ECON 5250 Labor Economics
[4 credit hours]
The labor market is studied. Topics include labor force characteristics, wage determination, hours and condition of work, human capital models, unemployment, labor union structure and growth, and modern labor legislation.
Prerequisites: ECON 1200 (may be taken concurrently) with a minimum grade of D- and ECON 2810 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring

ECON 5280 Energy Economics
[4 credit hours]
This course explores the theoretical and empirical perspectives on the demand and supply sides of the energy markets. This course starts with an energy outlook in both domestic and global scales. Then it discusses the natural resource modelling, energy supply, and the behavioral underpinnings of the energy demand. The course continues with current and historical aspects of national and global markets for oil, natural gas, coal, electricity, nuclear power, and renewable energy.
Prerequisites: ECON 1150 with a minimum grade of D- or ECON 1200 with a minimum grade of D-

ECON 5300 Mathematical Economics
[3 credit hours]
Development and applications of the mathematical tools used by economists. Differential and integral calculus, linear algebra, transcendental functions and series.
Prerequisites: ECON 1150 with a minimum grade of D- or ECON 1200 with a minimum grade of D-
Term Offered: Spring, Fall

ECON 5410 American Economic History
[3 credit hours]
Exploration of economic growth in America from pre-Columbian times to the present day. Analysis of economic institutions, technological change, industrialization and standards of living.
Prerequisites: ECON 1150 with a minimum grade of D- or ECON 1200 with a minimum grade of D- or ECON 1880 with a minimum grade of D-

ECON 5510 International Economics I
[4 credit hours]
Theory of international trade; commercial policy; costs and benefits, economic integration; trade and economic growth and balance of payments problems.
Prerequisites: ECON 1150 with a minimum grade of D-
Term Offered: Spring

ECON 5620 Regional Economics
[3 credit hours]
Examination of regional income estimates and social accounts, regional multipliers, diverse location theories, supplemented with techniques of regional analysis.
Prerequisites: ECON 1200 with a minimum grade of D-

ECON 5660 Public Finance Economics
[4 credit hours]
An analysis of the government sector in the economy, government expenditures, taxation and borrowing and their effects on employment, price levels and growth.
Prerequisites: ECON 1200 with a minimum grade of D-
Term Offered: Spring

ECON 5750 Health Economics
[3 credit hours]
Economic analysis of health and health services. Topics currently include medical and allied manpower, hospitals, drugs and cost-benefit analysis of selected health programs.
Prerequisites: ECON 1200 (may be taken concurrently) with a minimum grade of D- and ECON 2810 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Fall

ECON 5810 Econometrics Models And Methods I
[4 credit hours]
An introduction to econometric methods and their use in quantitative analysis of economic theories. Diagnostics for problems typically encountered are detailed along with techniques for correcting these problems.
Prerequisites: MATH 2600 with a minimum grade of D- or ECON 2810 with a minimum grade of D- or PSY 2100 with a minimum grade of D- or SOC 3290 with a minimum grade of D- or GEPL 4420 with a minimum grade of D-
Term Offered: Fall

ECON 5820 Econometrics Models And Methods II
[4 credit hours]
An introduction to forecasting methods for economic time-series including Bayesian methods. Both theory and application of forecasting models and methods are covered.
Prerequisites: ECON 5810 with a minimum grade of D-
Term Offered: Spring

ECON 5830 Econometrics Models And Methods III
[3 credit hours]
Econometric methods that apply to survey, spatial and cross-sectional/time-series data along with other specialized modeling techniques are covered.
Prerequisites: ECON 5810 with a minimum grade of D-
Term Offered: Spring, Fall

ECON 6260 Behavioral Economics
[4 credit hours]
Economic analysis of decisions made by people. Topics include decision-making under risk and uncertainty, strategic decision-making, and experimental economics.
Prerequisites: ECON 1200 (may be taken concurrently) with a minimum grade of D- and ECON 2810 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring

ECON 6810 Seminar in Applied Econometrics I
[2 credit hours]

ECON 6820 Seminar in Applied Econometrics II
[2 credit hours]

ECON 6830 Seminar in Applied Econometrics III
[2 credit hours]

ECON 6900 Graduate Research
[1-7 credit hours]

ECON 6950 Capstone Project
[0 credit hours]
Demonstration of applied economic analysis through a Master's paper or equivalent.
Term Offered: Spring, Summer, Fall

ECON 6960 Thesis
[1-8 credit hours]

ECON 6990 Graduate Readings
[1-7 credit hours]

Education Technology and Performance Technology (ETPT)

ETPT 5000 Introduction To Educational Technology
[3 credit hours]
Introduces the field of Educational Technology and its relevant competencies. Examines current trends in Educational Technology.
Term Offered: Spring, Summer, Fall

ETPT 5100 Instructional Systems Design Principles
[3 credit hours]
An introduction to various ISD models and approaches for designing effective systems of instruction. Students will begin to acquire experience in the actual analysis, design, development and evaluation of instruction.
Term Offered: Spring, Summer

ETPT 5210 Introduction To Multimedia And Web Design
[3 credit hours]
An introduction to the software, hardware and processes involved in the design and development of multimedia and Web-based instructional materials.
Term Offered: Fall

ETPT 5550 Using The Internet In The Classroom
[3 credit hours]
An introduction to effective use of Internet resources in instruction.
Term Offered: Spring, Summer, Fall

ETPT 5990 Graduate Independent Study In Educational Technology & Performance Technology
[1-5 credit hours]
Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of educational technology & performance technology faculty.
Term Offered: Spring, Summer, Fall

ETPT 6150 Designing Instruction For Diverse Learner Populations
[3 credit hours]
Focuses on instructional designer's role in assessing and addressing such differences as performance environment, culture, ethnicity, physical attributes, age/experience and socioeconomic factors to maximize learning.
Prerequisites: ETPT 5100 with a minimum grade of D-
Term Offered: Spring, Summer

ETPT 6230 Developing Web-Based Instructional Materials
[3 credit hours]
Students apply previously acquired skills in multimedia and Web design to develop instructional materials for delivery via the World Wide Web.
Prerequisites: ETPT 5100 with a minimum grade of D-
Term Offered: Spring

ETPT 6300 Technology Management In K-16 Education
[3 credit hours]
Provides teachers and technology coordinators with the knowledge and skills necessary to manage instructional computer laboratories and services in K-16 settings.
Term Offered: Summer, Fall

ETPT 6510 Teaching And Learning At A Distance
[3 credit hours]
Investigates various applications of distance learning for education and training.
Term Offered: Spring, Summer

ETPT 6810 Research And Theory In Educational Technology And Performance Technology
[3 credit hours]
Investigates current major research trends and topics in various areas of educational technology and performance technology. Students develop and present a research proposal.

ETPT 6900 Master's Seminar In Educational Technology And Performance Technology
[3 credit hours]
This course is the culminating experience in the ETPT master's program. Students complete a project under supervision of an educational technology faculty member.
Prerequisites: (ETPT 5000 with a minimum grade of D- and ETPT 6110 with a minimum grade of D-)
Term Offered: Spring, Summer, Fall

ETPT 6940 Practicum In Educational Technology And Performance Technology
[3 credit hours]
Students apply ETPT course work to solve an instructional and/or performance problem for a client organization under the supervision of educational technology faculty.

ETPT 7000 Introduction To Educational Technology
[3 credit hours]
Introduces the field of educational technology and its relevant competencies. Examines current trends in educational technology.
Term Offered: Spring, Summer, Fall

ETPT 7100 Instructional Systems Design Principles
[3 credit hours]
An introduction to various ISD models and approaches for designing effective systems of instruction. Students will begin to acquire experience in the actual analysis, design, development and evaluation of instruction.
Term Offered: Spring, Summer

ETPT 7210 Introduction To Multimedia And Web Design
[3 credit hours]
An introduction to the software, hardware and processes involved in the design and development of multimedia and Web-based instructional materials.
Term Offered: Fall

ETPT 7550 Using The Internet In The Classroom
[3 credit hours]
An introduction to effective use of Internet resources in instruction.
Term Offered: Spring, Fall

ETPT 7990 Independent Study in ETPT
[1-5 credit hours]
Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of Educational Technology faculty.
Term Offered: Spring, Summer, Fall

ETPT 8150 Designing Instruction For Diverse Learner Populations
[3 credit hours]
Focuses on instructional designer's role in assessing and addressing such differences as performance environment, culture, ethnicity, physical attributes, age/experience and socioeconomic factors to maximize learning.
Prerequisites: ETPT 7100 with a minimum grade of D-
Term Offered: Spring, Summer

ETPT 8230 Developing Web-Based Instructional Materials
[3 credit hours]
Students apply previously acquired skills in multimedia and Web design to develop instructional materials for delivery via the World Wide Web.
Prerequisites: (ETPT 7100 with a minimum grade of D- and ETPT 7210 with a minimum grade of D-)
Term Offered: Spring

ETPT 8300 Technology Management In K-16 Education
[3 credit hours]
Provides teachers and technology coordinators with the knowledge and skills necessary to manage instructional computer laboratories and services in K-16 settings.
Term Offered: Summer, Fall

ETPT 8510 Teaching And Learning At A Distance
[3 credit hours]
Investigates various applications of distance learning systems for education and training.
Term Offered: Spring, Summer

ETPT 8810 Research And Theory In Educational Technology And Performance Technology
[3 credit hours]
Investigates current major research trends and topics in various areas of educational technology and performance technology. Students develop and present a research proposal.
Term Offered: Summer, Fall

ETPT 8940 Practicum In Educational Technology And Performance Technology
[3 credit hours]
Students apply ETPT course work to solve an instructional and/or performance problem for a client organization under the supervision of educational technology faculty.
Term Offered: Fall

ETPT 8960 Dissertation In Educational Technology And Performance Technology
[1-12 credit hours]
Original research in an area of educational technology and performance technology.
Term Offered: Spring, Summer, Fall

Educational Administration and Supervision (EDAS)

EDAS 6000 The Individual In Organizations
[3 credit hours]
An overview of the individual in educational administration, i.e., as visionary leader, organizational leader, instructional leader and policy/community leader. Opportunities for personal assessment are provided as students explore critical educational issues in schools.
Term Offered: Spring, Summer, Fall

EDAS 6010 Leadership in School Curriculum
[3 credit hours]
An in-depth analysis of curriculum leadership to improve teacher classroom performance and to ensure that the district curriculum and instructional programs are aligned and operationalized to provide full access and opportunity to all students and student groups to meet district goals.
Term Offered: Spring, Fall

EDAS 6020 Instructional Leadership and Supervision
[3 credit hours]
An in-depth analysis of instructional leadership and principles of supervision which promote improved instruction. Emphasis is on teacher performance evaluation, curriculum management and strategies for creating a philosophical shift from a special education/regular education dichotomy to a universal education paradigm.
Term Offered: Spring, Fall

EDAS 6110 Legal Aspects Of School Administration
[3 credit hours]
This course provides students an opportunity to analyze legal frameworks affecting the organization and administration of public schools, including special education law, church-state issues, pupil rights, staff-student relationships, conditions of employment, teacher organizations, tort liability, school finance, and desegregation. Participants will examine the basic legal structure for education, case and statutory law, legal principles, and provisions relevant to administration.
Term Offered: Spring, Summer, Fall

EDAS 6150 Data Driven Leadership: A Hands On Approach
[3 credit hours]
Students will critically examine the intersection of current leadership theories with the principles of computational thinking. The course focuses on the most critical responsibilities of building principals in creating and managing high achieving and high functioning schools. The emphasis will be on the practical, “hands-on” skill building administrators need in order to effectively lead and manage schools. A primary focus will be on developing an understanding of how leaders use data to improve schools to move the organization forward. In addition, this course emphasizes building a tech-forward vision for school leadership that aligns with future workforce demands, fostering a school culture where digital literacy and problem-solving are integral to the learning process.
Term Offered: Spring

EDAS 6190 Integrated Experiences: Prac i
[3 credit hours]
Working in a guided reflective practice environment, the student will apply knowledge gained in previous coursework to working in school building operations, and to developing a professional portofolio.
Term Offered: Spring, Fall

EDAS 6230 Community And Schools
[3 credit hours]
This course explores the unique relationship between communities and schools. The democratic social structure is examined through a theoretical critique of strategies that increase citizen involvement in and build support for schools.
Term Offered: Spring, Summer, Fall

EDAS 6440 Equity Issues In Educational Finance And Economics
[3 credit hours]
Analysis of educational finance and economic issues pertinent to school districts. Analysis of various funding models at the local, state and national level are studied employing various measures of equity. Building/District level school finance and resource management strategies are examined.
Term Offered: Spring, Summer, Fall

EDAS 6920 Master's Project In Educational Administration
[1-3 credit hours]
Open to graduate students who elect the completion of a research project in fulfilling the research requirements of the master's program.
Term Offered: Spring, Summer, Fall

EDAS 6960 Master's Thesis In Educational Administration
[1-3 credit hours]
Open to graduate students who elect the completion of a research thesis in fulfilling the research requirements of the master's program.
Term Offered: Spring, Summer, Fall

EDAS 6990 Individual Study In Educational Administration - Master's
[1-3 credit hours]
Open to graduate students who wish to pursue individual study on professional problems in EDAS under the direction of an EDAS faculty member.
Term Offered: Spring, Summer

EDAS 7920 Specialist Project In Educational Administration
[1-3 credit hours]
Open to graduate students to fulfill the completion of a research project in fulfilling the research requirements of the specialist program.
Term Offered: Spring, Summer, Fall

EDAS 7990 Independent Study In Education Administration
[1-3 credit hours]
Individual study on professional problems in EDAS under the direction of a EDAS faculty member.
Term Offered: Spring, Summer, Fall

EDAS 8000 The Individual In Organizations
[3 credit hours]
An overview of the individual in educational administration, i.e., as visionary leader, organizational leader, instructional leader and policy/community leader. Opportunities for personal assessment are provided as students explore critical educational issues in schools.
Term Offered: Spring, Summer, Fall

EDAS 8010 Leadership in School Curriculum
[3 credit hours]
An in-depth analysis of curriculum leadership to improve teacher classroom performance and to ensure that the district curriculum and instructional programs are aligned and operationalized to provide full access and opportunity to all students and student groups to meet district goals.
Term Offered: Spring, Fall

EDAS 8020 Instructional Leadership and Supervision
[3 credit hours]
An in-depth analysis of instructional leadership and principles of supervision which promote improved instruction. Emphasis is on teacher performance evaluation, curriculum management and strategies for creating a philosophical shift from a special education/regular education dichotomy to a universal education paradigm.
Term Offered: Spring, Fall

EDAS 8110 Legal Aspects Of School Administration
[3 credit hours]
This course provides students an opportunity to analyze legal frameworks affecting the organization and administration of public schools, including special education law, church-state issues, pupil rights, staff-student relationships, conditions of employment, teacher organizations, tort liability, school finance, and desegregation. Participants will examine the basic legal structure for education, case and statutory law, legal principles, and provisions relevant to administration.
Term Offered: Spring, Summer, Fall

EDAS 8150 Data Driven Leadership: A Hands On Approach
[3 credit hours]
Students will critically examine the intersection of current leadership theories with the principles of computational thinking. The course focuses on the most critical responsibilities of building principals in creating and managing high achieving and high functioning schools. The emphasis will be on the practical, "hands-on" skill building administrators need in order to effectively lead and manage schools. A primary focus will be on developing an understanding of how leaders use data to improve schools to move the organization forward. In addition, this course emphasizes building a tech-forward vision for school leadership that aligns with future workforce demands, fostering a school culture where digital literacy and problem-solving are integral to the learning process.
Term Offered: Spring

EDAS 8190 Integrated Experiences In Education Administration
[3 credit hours]
Working in a guided reflective practice environment, the student will apply knowledge gained in previous coursework to working in school building operations.
Term Offered: Spring, Fall

EDAS 8230 Community And Schools
[3 credit hours]
This course explores the unique relationship between communities and schools. The democratic social structure is examined through a theoretical critique of strategies that increase citizen involvement in and build support for schools.
Term Offered: Spring, Summer, Fall

EDAS 8300 Integrate Experiences: Policies In Action
[3 credit hours]
This course analyses policies employed by schools and school districts in providing for education of students and services to the school community. On-site fieldwork is required.
Term Offered: Spring, Fall

EDAS 8420 Micropolitics Of School Communities
[3 credit hours]
Course focus is on the day to day politics of school work that increase the complexities of educating. Using case studies and problem-based learning, students will practice skills that support democratic practices in school communities.
Term Offered: Spring, Fall

EDAS 8440 Equity Issues In Educational Finance And Economics
[3 credit hours]
Analysis of educational finance and economic issues pertinent to school districts. Analysis of various funding models at the local, state and national level are studied employing various measures of equity. Building/District level school finance and resource management strategies are examined.
Term Offered: Spring, Summer, Fall

EDAS 8600 Leadership And Organizational Theory
[3 credit hours]
An analysis of leadership and organizational theory as influences on current thinking about and approaches to educational administration. Emphasis is on understanding dominant themes that impact administrative theory.
Term Offered: Fall

EDAS 8640 Leading Systems Change
[3 credit hours]
Course explores processes and practices used by educators to redesign preK-12 educational systems to improve outcomes for students. Content examines processes of moving espoused organizational values to actionable knowledge. Organizational Development recommended.
Term Offered: Spring, Fall

EDAS 8660 Critical Analysis Of Inquiry In Schools
[3 credit hours]
Concepts in understanding and evaluating contemporary educational research, addressing both quantitative and qualitative research methods. The focus is on the knowledge base school leaders must have to evaluate, use and initiate educational research in school settings.
Term Offered: Spring, Fall

EDAS 8930 Doctoral Seminar In Educational Administration And Supervision
[3 credit hours]
The course examines research findings and research methodology in Educational Administration and Supervision as they are pertinent to development of dissertation proposals. Dissertation proposal development is encouraged.
Term Offered: Spring, Fall

EDAS 8960 Doctoral Dissertation In Educational Administration And Supervision
[1-12 credit hours]
Production of an original, scholarly product in the area Educational Administration and Supervision. Dissertation credit may total not less than 12 semester hours.
Term Offered: Spring, Summer, Fall

Educational Psychology (EDP)

EDP 5110 Advanced Educational Psychology
[3 credit hours]
A graduate level introduction to the field of educational psychology. Instruction will cover fundamentals of learning, motivation, cognition, individual differences and instructional applications as well as a research-oriented approach to answering scientific questions.
Term Offered: Spring, Summer, Fall

EDP 5220 Adolescent Behavior And Development
[3 credit hours]
Current theory and research on physical, cognitive, social, emotional and personality development are examined and used as the basis for identifying and solving problems related to adolescent growth and development.
Term Offered: Spring, Summer, Fall

EDP 5250 Addressing Student and Educator Mental Health
[3 credit hours]
This course explores the intersection of mental health within educational environments, focusing on the mental well-being of both students and educators. Through an interdisciplinary approach, students will examine the unique stressors and challenges faced by individuals in academic settings, including anxiety, depression, burnout, and trauma. The course will cover the impact of these mental health issues on learning, teaching, and overall educational outcomes.
Term Offered: Spring, Fall

EDP 5310 Issues And Innovations In Learning And Instruction
[3 credit hours]
Reviews emergent theory, principles and research findings on cognition and learning and applies these concepts to developing instructional experiences and conditions for optimizing classroom learning and performance.
Term Offered: Spring, Fall

EDP 5320 Instructional Psychology
[3 credit hours]
Theory and research in psychology that contributes to effective instruction. Topics include varieties and conditions of learning, information processing, learning analysis, constructivism, mastery learning, cooperative learning, norm & criterion-referenced measurement.
Term Offered: Spring

EDP 5340 Classroom Engagement and Behavioral Supports
[3 credit hours]
The course builds teacher candidate's knowledge of social and emotional development and needs for children. Teacher candidates develop skills to develop support positive classroom dynamics, prosocial behaviors and classroom management. The course addresses theory and practical application of current behavioral support approaches as well as the evolution of the field across time. Special attention will be paid to current best practice as it applies to the early childhood classroom.
Term Offered: Spring, Summer, Fall

EDP 5950 Workshop In Educational Psychology
[3 credit hours]
Each workshop is developed around a topic of interest and concern to in-service teachers and other educational personnel. Practical application of workshop topics will be emphasized.
Term Offered: Summer, Fall

EDP 6120 School Violence Theory, Prevention, and Intervention
[3 credit hours]
The seminar focuses on the assessment, management, and prevention of school violence. The role of nature and nurture will be explored, as will society's role (e.g., teachers, school administrators) in assessment, prevention and intervention. The forms of violence to be addressed are child abuse, gang activity, bullying, harassment, and targeted violence.
Term Offered: Spring, Summer, Fall

EDP 6140 Motivation Theory And Application
[3 credit hours]
Graduate-level study of conceptions of motivation in various settings. Emphasis is on understanding major concepts and principles, as well on application to such settings as classroom, counseling and industry.
Prerequisites: EDP 5110 with a minimum grade of D- or EDP 5210 with a minimum grade of D- or EDP 5220 with a minimum grade of D- or EDP 5230 with a minimum grade of D- or EDP 7110 with a minimum grade of D- or EDP 7230 with a minimum grade of D-
Term Offered: Spring

EDP 6150 CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT
[3 credit hours]
This course aims to develop a broader understanding of the role of culture in psychological processes and the implications of such psychological understanding for a culturally diverse society.
Term Offered: Spring, Fall

EDP 6160 Self and Identity
[3 credit hours]
The Self and Identity course examines the content, structure, organization of self, self-processes, both implicit and explicit, involving cognition, evaluation, motivation, and emotional dimensions of the development of selfhood. The course also examines the meaning of personal and interpersonal identities including cultural, ethnic, and gender identity and the role of context in shaping these multiple identities. The implications of the readings for educators.
Prerequisites: EDP 5110 with a minimum grade of C or EDP 5120 with a minimum grade of C or EDP 5220 with a minimum grade of C or EDP 5230 with a minimum grade of C or PSY 4500 with a minimum grade of C or PSY 4700 with a minimum grade of C

EDP 6190 Seminar In Educational Psychology
[3 credit hours]
The collaborative study of a specific topic in educational psychology by a group of advanced students under the direction of one or more professors.
Term Offered: Spring, Summer, Fall

EDP 6250 Social Development
[3 credit hours]
Critical examination of theory and research on social behaviors such as attachment, aggression and prosocial behavior, including their causes, how they affect the person and how they change with age.
Prerequisites: EDP 5210 with a minimum grade of D- or EDP 5220 with a minimum grade of D-
Term Offered: Spring, Fall

EDP 6270 Parenting: Theory And Research
[3 credit hours]
Analysis and evaluation of the research on parenting across a variety of sociocultural contexts.
Prerequisites: EDP 5320 with a minimum grade of D-

EDP 6340 Theories Of Learning
[3 credit hours]
Intensive inquiry into the study of learning with particular emphasis on more recent theories. Theory application in a wide variety of settings will also be stressed.

EDP 6370 News Media Literacy, Society, and the Mind
[3 credit hours]
The course provides students with a theoretical and empirical foundation on psychological concepts and processes (e.g., critical thinking, personal epistemology, and belief systems), to understand the role of the news media (e.g., news print/broadcast, social media, and media technology) for the public sphere, citizenship, democracy, and peace. In their area of studies, students will learn how to develop a competency based news media literacy model that enables citizens to be/come critical and effective news media consumers.

EDP 6380 Prevention Through Postvention in Targeted Violence Terrorism and Suicide
[3 credit hours]
This course provides information on key aspects of prevention, intervention, active response, and postvention applied to incidents of targeted violence such as campus shootings, terrorism, and suicide. The content is based on government reports, journal articles, and post incident analyses. Emphasis is placed on practical application of the course content. The course is relevant to those pursuing degrees in educational psychology, psychology, counselor education, educational administration, higher education, criminal justice and related fields.

EDP 6960 Master's Thesis In Educational Psychology
[1-3 credit hours]
A formal, independent study culminating in a written discourse that advances our understanding of educational psychology.
Term Offered: Spring, Summer, Fall

EDP 6980 Master's Project In Educational Psychology
[1-3 credit hours]
A formal, independent project applying principles of educational psychology to solve a particular problem and culminating in a written discourse.
Term Offered: Spring, Summer, Fall

EDP 6990 Independent Study In Educational Psychology
[1-3 credit hours]
Directed study of a current topic in educational psychology. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Fall

EDP 7110 Advanced Educational Psychology
[3 credit hours]
A graduate level introduction to the field of educational psychology. Instruction will cover fundamentals of learning, motivation, cognition, individual differences and instructional applications as well as a research-oriented approach to answering scientific questions.
Term Offered: Spring, Summer, Fall

EDP 7250 Addressing Student and Educator Mental Health
[3 credit hours]
This course explores the intersection of mental health within educational environments, focusing on the mental well-being of both students and educators. Through an interdisciplinary approach, students will examine the unique stressors and challenges faced by individuals in academic settings, including anxiety, depression, burnout, and trauma. The course will cover the impact of these mental health issues on learning, teaching, and overall educational outcomes.
Term Offered: Spring, Fall

EDP 7310 Issues And Innovations In Learning And Instruction
[3 credit hours]
Reviews emergent theory, principles and research findings on cognition and learning and applies these concepts to developing instructional experiences and conditions for optimizing classroom learning and performance.
Term Offered: Spring, Fall

EDP 7950 Workshop In Educational Psychology
[3 credit hours]
Each workshop is developed around a topic of interest and concern to in-service teachers and other educational personnel. Practical application of workshop topics will be emphasized.
Term Offered: Summer, Fall

EDP 8120 School Violence Theory, Prevention, and Intervention
[3 credit hours]
The seminar focuses on the assessment, management, and prevention of school violence. The role of nature and nurture will be explored, as will society's role (e.g., teachers, school administrators) in assessment, prevention and intervention. The forms of violence to be addressed are child abuse, gang activity, bullying, harassment, and targeted violence.
Term Offered: Spring, Summer, Fall

EDP 8140 Motivation Theory And Application
[3 credit hours]
Graduate-level study of conceptions of motivation in various settings. Emphasis is on understanding major concepts and principles, as well on application to such settings as classroom, counseling and industry.
Prerequisites: EDP 5110 with a minimum grade of D- or EDP 5210 with a minimum grade of D- or EDP 5220 with a minimum grade of D- or EDP 5230 with a minimum grade of D- or EDP 7110 with a minimum grade of D- or EDP 7230 with a minimum grade of D-
Term Offered: Spring

EDP 8150 CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT
[3 credit hours]
This course aims to develop a broader understanding of the role of culture in psychological processes and the implications of such psychological understanding for a culturally diverse society.
Term Offered: Spring, Fall

EDP 8160 Self and Identity
[3 credit hours]
The Self and Identity course examines the content, structure, organization of self, self-processes, both implicit and explicit, involving cognition, evaluation, motivation, and emotional dimensions of the development of selfhood. The course also examines the meaning of personal and interpersonal identities including cultural, ethnic, and gender identity and the role of context in shaping these multiple identities. The implications of the readings for educators.
Prerequisites: EDP 5110 with a minimum grade of C or EDP 5120 with a minimum grade of C or EDP 5220 with a minimum grade of C or EDP 5230 with a minimum grade of C or PSY 4500 with a minimum grade of C or PSY 4700 with a minimum grade of C

EDP 8190 Seminar In Educational Psychology
[3 credit hours]
The collaborative study of a specific topic in educational psychology by a group of advanced students under the direction of one or more professors.
Term Offered: Spring, Summer, Fall

EDP 8250 Social Development
[3 credit hours]
Critical examination of theory and research on social behaviors such as attachment, aggression and prosocial behavior, including their causes, how they affect the person and how they change with age.
Prerequisites: EDP 5210 with a minimum grade of D- or EDP 5220 with a minimum grade of D-
Term Offered: Spring, Fall

EDP 8270 Parenting: Theory And Research
[3 credit hours]
Analysis and evaluation of the research on parenting across a variety of sociocultural contexts.

EDP 8340 Theories Of Learning
[3 credit hours]
Intensive inquiry into the study of learning with particular emphasis on more recent theories. Theory application in a wide variety of settings will also be stressed.

EDP 8370 News Media Literacy, Society, and the Mind
[3 credit hours]
The course provides students with a theoretical and empirical foundation on psychological concepts and processes (e.g., critical thinking, personal epistemology, and belief systems), to understand the role of the news media (e.g., news print/broadcast, social media, and media technology) for the public sphere, citizenship, democracy, and peace. In their area of studies, students will learn how to develop a competency based news media literacy model that enables citizens to be/come critical and effective news media consumers.

EDP 8380 Prevention through Postvention of Targeted Violence, Terrorism and Suicide
[3 credit hours]
This course provides information on key aspects of prevention, intervention, active response, and postvention applied to incidents of targeted violence such as campus shootings, terrorism, and suicide. The content is based on government reports, journal articles, and post incident analyses. Emphasis is placed on practical application of the course content. The course is relevant to those pursuing degrees in educational psychology, psychology, counselor education, educational administration, higher education, criminal justice, and related fields.

EDP 8960 Dissertation Research In Educational Psychology
[1-12 credit hours]
A formal, independent study culminating in a written discourse that advances our understanding of educational psychology.
Term Offered: Spring, Summer, Fall

EDP 8990 Independent Study In Educational Psychology
[1-6 credit hours]
Directed study of a current topic in educational psychology. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Summer, Fall

Electrical Engineering and Computer Science (EECS)

EECS 5120 Introduction to Fuzzy Systems and Applications
[3 credit hours]
Introduction to Fuzzy Rule Based Intelligent Systems. Basic concepts of Fuzzy logic, Fuzzy Sets, Fuzzy Arithmetic, Fuzzy Relations, Fuzzy Graphs, Approximate Reasoning and Fuzzy Implication. Applications in Real World Domains.
Term Offered: Spring, Fall

EECS 5200 Feedback Control Systems
[3 credit hours]
Feedback methods for the control of dynamic systems. Topics include characteristics and performance of feedback systems, state variable analysis stability, root locus and frequency response methods and computer simulations.
Term Offered: Spring

EECS 5220 Programmable Logic Controllers
[3 credit hours]
Programmable Logic Controllers (PLCs), programming, sensors, process control algorithms, interfacing of sensors and other I/O devices, simulation and networking.
Term Offered: Spring, Fall

EECS 5240 Power Systems Operation
[3 credit hours]
Single Line Diagrams & Per Unit calculations, Network Matrices & Ybus for systems with uncoupled lines, Load Flow Techniques, Large system Loss Formula using Zbus, Real and Reactive Power Dispatch programming, Power systems relays & protection schemes.
Term Offered: Spring, Fall

EECS 5260 Control Systems Design
[3 credit hours]
A general study of computer-aided design of control systems. Topics include: stability, compensation, pole placement, nonlinear systems and digital systems.
Term Offered: Fall

EECS 5330 Image Analysis And Computer Vision
[3 credit hours]
Imaging geometry, image filtering, segmentation techniques, image representation and description, stereovision and depth measurements, texture analysis, dynamic vision and motion analysis, matching and recognition.
Term Offered: Spring, Fall

EECS 5360 Communication Systems
[3 credit hours]
Fourier transform applications in signal analysis and communication. Signals spectra, filtering, AM and FM modulation, noise and optimum receiver, sampling theorem, multiplexing, PCM, introduction to digital modulators and demodulators.
Prerequisites: EECS 3300 with a minimum grade of D-
Term Offered: Spring, Fall

EECS 5370 Information Theory And Coding
[3 credit hours]
Coding concepts, Huffman code, Entropy analysis, Channel and mutual information, Channel capacity and Shannon's theorems, Algebraic coding theory and application to block code and cyclic code, Introduction to convolutional code.
Term Offered: Spring, Fall

EECS 5380 Digital Signal Processing
[3 credit hours]
Discrete Fourier Transform (DFT), discrete convolution and correlation, Fast Fourier Transform (FFT) and its applications, design of IIR and FIR digital filters, multirate/channel digital systems, decimation and interpolation.
Prerequisites: EECS 3210 with a minimum grade of D-
Term Offered: Spring, Fall

EECS 5390 Wireless And Mobile Networks
[3 credit hours]
Mobile radio propagation; traffic engineering; cellular concept; multiple radio access; multiple division techniques; channel allocation; mobile communication systems; existing wireless systems; network protocols; Ad Hoc and sensor networks; wireless LANS and PANS; recent advances.
Term Offered: Spring, Fall

EECS 5410 Electro-Optics
[3 credit hours]
Laser physics, optics, optical waveguides, optical communication systems and electro-optics. Design of light processing and communication systems will be considered with emphasis on optics and optical communication.
Term Offered: Spring, Fall

EECS 5460 Power Systems Management
[3 credit hours]
An advanced study of the management and operation of today's power system. Included are historical developments, utility and operational costs and economics, power generation alternatives, fuel alternatives, renewable applications, transmission and distribution practices, and a discussion of current power system issues, both in the U.S. and abroad.
Prerequisites: EECS 3220 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

EECS 5480 Power Electronics 1
[3 credit hours]
Basic electronic power switching circuits. Half-wave and full-wave rectification. Characteristics of power semiconductors. Phase-controlled rectifiers and inverters. Isolated and non-isolated dc-dc converters.
Term Offered: Spring, Fall

EECS 5500 Programming for the World Wide Web
[3 credit hours]
Fundamental concepts and programming languages for constructing contempoary websites. Differences and similarities between procedural, object-oriented, and scripting languages. Topics include HTML, Javascript, CSS, XML, Ajax, PHP, ASP.net, Three.js, and related technologies, as well as their impact on the programming process.
Term Offered: Spring

EECS 5520 Advanced Systems Programming
[3 credit hours]
This course examines pertinent concepts of systems programming. Topics covered include: synchronization, distributed programming models, kernel design, peripheral handling, file systems and security history and methods.
Prerequisites: EECS 3540 with a minimum grade of D-
Term Offered: Spring

EECS 5530 Computer Graphics I
[3 credit hours]
An introduction to typical computer graphics systems and their operation. Interactive techniques will be introduced as well as representations and projections of three-dimensional images. Exercises using graphics equipment are assigned.
Prerequisites: EECS 2510 with a minimum grade of D-
Term Offered: Spring, Fall

EECS 5560 Database Systems I
[3 credit hours]
The following topics are covered: relational database modeling, query languages, design issues and implementation issued of databases. An appropriate database language is introduced and used to demonstrate principles.
Term Offered: Spring, Fall

EECS 5590 Algorithms
[3 credit hours]
Techniques for devising efficient computer algorithms. Topics include: divide-and-conquer techniques, dynamic programming, linear programming, graph algorithms, greedy algorithms, NP and P complexity classes, and approximation algorithms for NP complete problems.
Prerequisites: EECS 2510 with a minimum grade of C- and EECS 4100 with a minimum grade of C-
Term Offered: Spring, Fall

EECS 5600 Solid State Devices
[3 credit hours]
Theory and operation of physical electronic devices. Electrical transport in metals, semiconductors and models of BJT's and FET's. Optoelectronic devices and integrated circuits. Laboratory includes hands-on experimentation with basic semiconductor fabrication processes.
Term Offered: Spring

EECS 5610 Digital VLSI Design I: Basic Subsystems
[3 credit hours]
CMOS process technologies, CMOS logic families, custom and semi-custom design. Subsystem design of adders, counters and multipliers. System design methods and VLSI design tools.
Prerequisites: EECS 3400 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

EECS 5640 Inside Cryptography
[3 credit hours]
Examines the inner workings of several cryptographic algorithms, including the discrete math behind them. Introduces operations in a Galois Field, and covers some Prime Number Theory. Symmetric algorithms include Feistel (DES) and non-Feistel (AES) designs; Asymmetric algorithms include Merkle-Hellman and RSA. Block and stream modes are explored, as are cryptographic hash functions, and ECB and Chained modes of encryption.
Prerequisites: EECS 2520 with a minimum grade of D- and EECS 3100 with a minimum grade of D-
Term Offered: Spring, Fall

EECS 5720 Fundamentals of Cyber Security
[3 credit hours]
This course introduces cybersecurity concepts and their relevance to national security, businesses, society, and individuals. Concepts that will be discussed include terminologies, blockchain, cryptocurrency, maths/statistics in the domain, review of various cybersecurity domains, forensics, and methods/practices to secure systems. Additional real-world security problems will be introduced through hands-on experiments.
Prerequisites: EECS 2110 with a minimum grade of D- or CSET 2200 with a minimum grade of D-
Term Offered: Spring, Fall

EECS 5740 Artificial Intelligence
[3 credit hours]
This course explores the topic of intelligent software agents with a emphasis on hands-on design of adaptive problem-solving agents for environments of increasing complexity ranging from single-agent computer games to complex real-world mult-agent environments.
Term Offered: Spring

EECS 5750 Machine Learning
[3 credit hours]
This course covers machine learning algorithms, theory and applications for decision tree, neural network, computational, Bayesian, evolutionary, and reinforcement learning.
Prerequisites: (MATH 1890 with a minimum grade of D- or MATH 2890 with a minimum grade of D-) and (MIME 4000 with a minimum grade of D- or EECS 3300 with a minimum grade of D- or MATH 4680 with a minimum grade of D- or MATH 2600 with a minimum grade of D-) and (EECS 1030 with a minimum grade of D- or CSET 1100 with a minimum grade of D-)
Term Offered: Spring, Fall

EECS 5760 Computer Security
[3 credit hours]
Survey of computer security concepts: ethics and responsibility, OS vulnerabilities and intrusion detection, viruses and worms, defensive strategies including secret/public key cryptosystems, firewalls and decoys.
Prerequisites: EECS 2110 with a minimum grade of C- and EECS 3540 with a minimum grade of C-
Term Offered: Fall

EECS 5770 Computer Hacking and Forensic Analysis
[3 credit hours]
This course is an introduction to discovering vulnerabilities, attacking/defending systems, responding to attacks, and identifying/designing controls for attack prevention. Topics include the evolution of hacking, penetration testing; cryptology; footprinting; vulnerability scanning and exploit; wireless, web, and database attacks; traffic analysis; incident response; and defensive technologies and controls.
Prerequisites: (EECS 2110 with a minimum grade of C- and EECS 4720 with a minimum grade of C-) or (EECS 5720 with a minimum grade of C)
Term Offered: Spring, Fall

EECS 5790 Network Security
[4 credit hours]
Theory and practice of network security. Topics include firewalls, Windows, UNIX and TCP/IP network security. Security auditing, attacks, viruses, intrusion detection and threat analysis will also be covered.
Prerequisites: EECS 4720 with a minimum grade of D- or EECS 5720 with a minimum grade of C
Term Offered: Spring

EECS 5830 Artificial Neural Networks and Deep Learning
[3 credit hours]
This course deals with various neural network architectures and learning algorithms for the training networks. Topics include perceptron, basic learning algorithms, the delta learning rule, multilayer feed forward NNs, backpropagation and gradient decent algorithm, cost functions, overfitting, regularization, and convolutional networks.
Term Offered: Spring, Fall

EECS 5920 Projects
[1-6 credit hours]
Independent research project with intensive investigation into an area of practical interest to the student and the instructor. Students will make progress in a project of an advanced nature in Electrical Engineering/Computer Science and Engineering. The project will culminate in a submission of a written report. Course may be repeated.
Term Offered: Spring, Summer, Fall

EECS 5930 Electrical Engineering & Computer Science Seminar
[1 credit hour]
Seminar talk series by invited speakers from academia, industry, research corporations, private or federal research labs, and funding agencies. 1 cr. hr. seminar.
Term Offered: Spring, Fall

EECS 5980 Special Topics in EECS
[1-4 credit hours]
Pilot offerings of new courses involving emerging topics of interest are introduced using this number. One credit per lecture hour or 2.5 lab hours per week.
Term Offered: Spring, Fall

EECS 6110 Advanced Computer Architecture
[3 credit hours]
Foundational principles involved in the design of modern computer systems. Topics include Instruction Set Architecture (ISA), CPU design, memory hierarchy, RISC/MIPS/CISC architectures, pipelining, ALU design, and input/output (I/O) systems. Cost performance analysis in computer architecture design, multicore, multiprocessor, and cluster architecture. Emerging trends and topics in computer architecture design.
Term Offered: Spring, Fall

EECS 6180 Biologically Inspired Computing
[3 credit hours]
Introduction to Computational Techniques inspired from Biology for Self Learning Adaptive Systems. Evolutionary Computations, Binary and Real coded Genetic Algorithms. Neural Networks, Swarm Intelligence, DNA Computing and Artificial Immune Systems. Hybrid systems such as Evolutionary Fuzzy Systems and Evolutionary Neural Systems, Swarm Neural Systems. Emerging Topics in Computing inspired by nature.
Term Offered: Fall

EECS 6190 Renewable Energy and Smart Grid
[3 credit hours]
Electric power systems nowadays are undergoing significant changes worldwide in order to become cleaner, smarter, and more reliable. This course examines a broad spectrum of topics relevant to theses changes.
Term Offered: Fall

EECS 6230 Optimal Control Theory
[3 credit hours]
Optimization of dynamic systems by the calculus of variations and Pontryagin's Maximum Principle. Solution of optimal control problems using direct and indirect computational methods. Applications include constrained state and/or control parameters.
Prerequisites: EECS 4200 with a minimum grade of D-

EECS 6300 Random Signals And Optimal Filters
[3 credit hours]
Description and properties of random signals and their processing by optimal filters. Correlation and power spectra. GRP. Narrowband noise. Signal detection (matched filter) and estimation (Wiener and Kalman filters).
Term Offered: Fall

EECS 6320 Data Compression For Multimedia Communication
[3 credit hours]
Multimedia information representation, Huffman, run length and arithmetic coding, predictive, transform, pyramid coding; vector quantization and subband coding; wavelet-based coding, data packetization, error resilience coding, mutimedia compression standards, JPEG, MPEG coding.
Term Offered: Spring

EECS 6340 Modern Communications Engineering I
[3 credit hours]
Introduction to detection and estimation and applications to the bandpass signals, Bibary and M-ary digital modulation techniques, Error-control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques.
Term Offered: Spring, Fall

EECS 6350 Modern Communications Engineering II
[3 credit hours]
Digital transmission over Gaussian/non-Faussian channels, Satellite systems (GEO and LEO) and multiple accesses, Cellular and satellite communication network, Mobile/wireless Personal communication services (PCS) and its networking.
Term Offered: Spring, Fall

EECS 6450 Advanced Power Electronics
[3 credit hours]
Dynamic analysis of DC-DC power conversion circuits. State space and converter transfer functions. Analytical semiconductor device modeling techniques. Sinusoidal pulse width modulation in inverter circuits. Isolated DC-DC converters.
Prerequisites: EECS 5480 with a minimum grade of D-
Term Offered: Spring

EECS 6550 Software Specification And Design
[3 credit hours]
This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.
Term Offered: Spring, Fall

EECS 6570 Intelligent Systems
[3 credit hours]
Heuristic search, game playing, constraint satisfaction, knowledge representation and reasoning with first order logic, planning, probabilistic modeling and reasoning, and learning.
Term Offered: Fall

EECS 6580 Wireless Sensor Networks
[3 credit hours]
Single node and network architecture, design principles, medium access control, naming and addressing, synchronization, localization and positioning, topology control, routing protocols, data-centric networking, and information and data aggregation.
Term Offered: Spring

EECS 6610 Principles of CMOS Devices
[3 credit hours]
MOSFET Device Physics, CMOS Fabrication, Scaling Trends, Characterization, Technology CAD, Digital Analog and RF Applications, Advanced Device Concepts, Nanoelectronics.
Term Offered: Spring

EECS 6630 Digital and VLSI System Testing
[3 credit hours]
In depth study of testing techniques for digital and VLSI circuit including memory and logic, field programmable gate arrays, system on chips, and quantum dot cellular automata circuits.
Term Offered: Spring

EECS 6650 Hardware Oriented Security and Trust
[3 credit hours]
The course covers the following topics: Hardware Security Basics, Physical Unclonable Function (PUF), Metrics for Evaluating PUFs, Split Manufacturing, Hardware Trojans, Detection of Hardware Trojans, Built-In Self-Repair Hardware Circuits, Security of FPGAs, Machine Learning Attack Models, Testing of Digital/VLSI Circuits.
Term Offered: Spring, Fall

EECS 6660 Field Programmable Gate Arrays
[3 credit hours]
Introduction to FPGA's. Programming technology. Logic block architectures. Routing architectures. FPGA based VLSI design. Design tools.
Term Offered: Spring, Fall

EECS 6830 Power Semiconductor Device Engineering
[3 credit hours]
Semiconductor material physics, electrical transport physics, power switching, power amplification characteristics, power diodes, power MOSFETs, power MOS-bipolar devices, thyristors, and emerging devices.
Term Offered: Fall

EECS 6840 Compound Semiconductors and Devices
[3 credit hours]
This course will cover the fundamentals of various compound-semiconductor materials and devices, including materials and device physics, diodes, GaAs MESFETS, optoelectronic and photovoltaic devices and structures.
Term Offered: Fall

EECS 6860 RF Integrated Circuits
[3 credit hours]
Wireless principles, Passive RLC networks, Passive IC component characteristics, MOS Device Physics, Distributed Systems, Smith Chart and s-parameters, Bandwidth estimation, high frequency amplifier design, voltage references, noise, LNA design, mixers, feedback systems, RF power amplifiers, PLLs, Oscillators and Synthesizers, Phase Noise, Transceiver architectures.
Term Offered: Spring

EECS 6870 Advanced Analog Integrated Circuits
[3 credit hours]
Integrated Circuit Technology, Device Modeling, MOS Switches, Current Sinks and Sources, Bandgap References, Amplifiers, Operational Amplifiers, Comparators, Switched-Capacitor Circuits, Data Converters
Term Offered: Fall

EECS 6900 Independent Research
[1-6 credit hours]
Selected topics from current EE and CSE research with intensive investigation into recent literature in an area of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

EECS 6910 EECS Graduate Seminar
[1 credit hour]
Students will attend seminars and prepare a report reflecting their learning, questions and the impact of the seminar series. Students will also present their thesis or project plan and initial research results.
Term Offered: Spring, Fall

EECS 6960 Master's Graduate Research And Thesis
[1-9 credit hours]
Graduate research towards the completion of a Master's degree. Students will make progress in a project of an advanced nature in Electrical Engineering/Computer Science and Engineering. The project will culminate in submission and a public defense a master's thesis. Course may be repeated.
Term Offered: Spring, Summer, Fall

EECS 6970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency full-time internship to provide an experiential learning component to the Master's/Doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

EECS 6980 Special Topics In Electrical Engineering & Computer Science
[1-5 credit hours]
Selected topics in the field of Electrical Engineering and Computer Science in areas of special interest to the class and the professor.
Term Offered: Spring, Summer, Fall

EECS 6990 Independent Study
[1-3 credit hours]
In depth study of a selected topic of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

EECS 8110 Advanced Computer Architecture
[3 credit hours]
Foundational principles involved in the design of modern computer systems. Topics include Instruction Set Architecture (ISA), CPU design, memory hierarchy, RISC/MIPS/CISC architectures, pipelining, ALU design, and input/output (I/O) systems. Cost performance analysis in computer architecture design, multicore, multiprocessor, and cluster architecture. Emerging trends and topics in computer architecture design.
Term Offered: Spring, Fall

EECS 8180 Biologically Inspired Computing
[3 credit hours]
Introduction to Computational Techniques inspired from Biology for Self Learning Adaptive Systems. Evolutionary Computations, Binary and Real coded Genetic Algorithms. Neural Networks, Swarm Intelligence, DNA Computing and Artificial Immune Systems. Hybrid systems such as Evolutionary Fuzzy Systems and Evolutionary Neural Systems, Swarm Neural Systems. Emerging Topics in Computing inspired by nature.
Term Offered: Fall

EECS 8190 Renewable Energy and Smart Grid
[3 credit hours]
Electric power systems nowadays are undergoing significant changes worldwide in order to become cleaner, smarter, and more reliable. This course examines a broad spectrum of topics relevant to theses changes.
Term Offered: Fall

EECS 8230 Optimal Control Theory
[3 credit hours]
Optimization of dynamic systems by the calculus of variations and Pontryagin's Maximum Principle. Solution of optimal control problems using direct and indirect computational methods. Applications include constrained state and/or control parameters.
Prerequisites: EECS 4200 with a minimum grade of D-

EECS 8300 Random Signals And Optimal Filters
[3 credit hours]
Description and properties of random signals and their processing by optimal filters. Correlation and power spectra. GRP. Narrowband noise. Signal detection (matched filter) and estimation (Wiener and Kalman filters).
Term Offered: Fall

EECS 8320 Data Compression For Multimedia Communication
[3 credit hours]
Multimedia information representation, Huffman, run length and arithmetic coding, predictive, transform, pyramid coding; vector quantization and subband coding; wavelet-based coding, data packetization, error resilience coding, mutimedia compression standards, JPEG, MPEG coding.
Term Offered: Spring

EECS 8340 Modern Communications Engineering I
[3 credit hours]
Introduction to detection and estimation and applications to the bandpass signals, Bibary and M-ary digital modulation techniques, Error-control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques.
Term Offered: Spring, Fall

EECS 8350 Modern Communications Engineering II
[3 credit hours]
Digital transmission over Gaussian/non-Faussian channels, Satellite systems (GEO and LEO) and multiple accesses, Cellular and satellite communication network, Mobile/wireless Personal communication services (PCS) and its networking.
Term Offered: Spring, Fall

EECS 8450 Advanced Power Electronics
[3 credit hours]
Dynamic analysis of DC-DC power conversion circuits. State space and converter transfer functions. Analytical semiconductor device modeling techniques. Sinusoidal pulse width modulation in inverter circuits. Isolated DC-DC converters.
Prerequisites: EECS 5480 with a minimum grade of D-
Term Offered: Spring

EECS 8550 Software Specification And Design
[3 credit hours]
This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.
Term Offered: Spring, Fall

EECS 8570 Intelligent Systems
[3 credit hours]
Heuristic search, game playing, constraint satisfaction, knowledge representation and reasoning with first order logic, planning, probabilistic modeling and reasoning, and learning.
Term Offered: Fall

EECS 8580 Wireless Sensor Networks
[3 credit hours]
Single node and network architecture, design principles, medium access control, naming and addressing, synchronization, localization and positioning, topology control, routing protocols, data-centric networking, and information and data aggregation.
Term Offered: Spring

EECS 8610 Principles of CMOS Devices
[3 credit hours]
MOSFET Device Physics, CMOS Fabrication, Scaling Trends, Characterization, Technology CAD, Digital Analog and RF Applications, Advanced Device Concepts, Nanoelectronics.
Term Offered: Spring

EECS 8630 Digital and VLSI System Testing
[3 credit hours]
In depth study of testing techniques for digital and VLSI circuit including memory and logic, field programmable gate arrays, system on chips, and quantum dot cellular automata circuits
Term Offered: Spring

EECS 8660 Field Programmable Gate Arrays
[3 credit hours]
Introduction to FPGA's. Programming technology. Logic block architectures. Routing architectures. FPGA based VLSI design. Design tools.
Term Offered: Spring, Fall

EECS 8670 Hardware Oriented Security and Trust
[3 credit hours]
The course covers the following topics: Hardware Security Basics, Physical Unclonable Function (PUF), Metrics for Evaluating PUFs, Split Manufacturing, Hardware Trojans, Detection of Hardware Trojans, Built-In Self-Repair Hardware Circuits, Security of FPGAs, Machine Learning Attack Models, and Testing of Digital/VLSI Circuits.
Term Offered: Spring, Fall

EECS 8830 Power Semiconductor Device Engineering
[3 credit hours]
Semiconductor material physics, electrical transport physics, power switching, power amplification characteristics, power diodes, power MOSFETs, power MOS-bipolar devices, thyristors, and emerging devices.
Term Offered: Fall

EECS 8840 Compound Semiconductors and Devices
[3 credit hours]
This course will cover the fundamentals of various compound-semiconductor materials and devices, including materials and device physics, diodes, GaAs MESFETS, optoelectronic and photovoltaic devices and structures.
Term Offered: Spring, Fall

EECS 8860 RF Integrated Circuits
[3 credit hours]
Wireless principles, Passive RLC networks, Passive IC component characteristics, MOS Device Physics, Distributed Systems, Smith Chart and s-parameters, Bandwidth estimation, high frequency amplifier design, voltage references, noise, LNA design, mixers, feedback systems, RF power amplifiers, PLLs, Oscillators and Synthesizers, Phase Noise, Transceiver architectures.
Term Offered: Fall

EECS 8870 Advanced Analog Integrated Circuits
[3 credit hours]
Integrated Circuit Technology, Device Modeling, MOS Switches, Current Sinks and Sources, Bandgap References, Amplifiers, Operational Amplifiers, Comparators, Switched-Capacitor Circuits, Data Converters
Term Offered: Fall

EECS 8900 Independent Research
[1-6 credit hours]
Selected topics from current EE and CSE research with intensive investigation into recent literature in an area of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

EECS 8910 EECS Graduate Seminar
[1 credit hour]
Students will attend seminars and prepare a report reflecting their learning, questions and the impact of the seminar series. Students will also present their thesis or project plan and initial research results.
Term Offered: Spring, Fall

EECS 8960 Dissertation
[1-9 credit hours]
Graduate research towards the completion of a Doctoral Degree. Course may be repeated.
Term Offered: Spring, Summer, Fall

EECS 8970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency full-time internship to provide an experiential learning component to the Master's/ Doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of U
Term Offered: Spring, Summer, Fall

EECS 8980 Current Topics In Electrical Engineering & Computer Science
[1-5 credit hours]
Current topics in the field of Electrical Engineering and Computer Science in areas of special interest to the class and the professor. Students will be expected to complete a written project based on a review of the research literature of the area covered in this course.
Term Offered: Spring, Summer, Fall

EECS 8990 Independent Study
[1-3 credit hours]
In depth study of a selected topic of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

English (ENGL)

ENGL 5090 Current Writing Theory
[3 credit hours]
An intensive study of current theories and research connecting reading, critical thinking and writing with applications of theory to students' literate practices and research.
Term Offered: Spring, Fall

ENGL 5100 The History Of English
[3 credit hours]
Study of the changes that have taken place in the English language from the earliest days to the present.
Term Offered: Spring, Summer, Fall

ENGL 5110 Old English
[3 credit hours]
Study of the phonology, morphology and syntax of Old English, with special attention to literary and cultural backgrounds. Representative readings in verse and prose.
Term Offered: Spring, Fall

ENGL 5150 Linguistic Principles
[3 credit hours]
Intensive study of modern linguistic theories about the nature and structure of language, with emphasis on English.
Term Offered: Spring, Fall

ENGL 5190 Sociolinguistics
[3 credit hours]
Combines linguistic and societal concerns through reading of empirical research; includes issues of language variation and related larger constructs such as speech community, communicative competence, dialect, and language change.
Term Offered: Spring, Fall

ENGL 5210 Issues in ESL Writing
[3 credit hours]
Course content
Term Offered: Spring, Fall

ENGL 5280 American Fiction: 20th and 21st Century
[3 credit hours]
Major developments in the 20th-century and 21st Century American short story and novel. Recommended: ENGL 3600 or 3790.
Term Offered: Spring, Fall

ENGL 5300 Medieval and Early Tudor Drama
[3 credit hours]
A study of drama and performance from the British Isles and relevant continental traditions in the late middle ages through the early 16th century, in their cultural, material, and performance contexts. Course may include performance traditions and texts such as monastic and liturgical drama, civic Creation-to-Doomsday play cycles manuscript collections of drama, morality plays, miracle and saints' plays, folk plays, courtly interludes and mummings, and royal entries, as well as modern revivals.

ENGL 5310 British Drama: 1580-1642
[3 credit hours]
A study of early British drama exclusive of Shakespeare, with particular attention to Elizabethan drama and its background.

ENGL 5340 Modern and Contemporary Drama
[3 credit hours]
Drama in English or translation from the late nineteenth century to the present.
Term Offered: Spring, Fall

ENGL 5410 Old And Middle English Literature
[3 credit hours]
Study of Old and Middle English Literature, using translations where necessary, with emphasis on major works and genres, cultural, philosophical, and historical contexts and backgrounds.
Term Offered: Spring, Fall

ENGL 5420 Renaissance Literature
[3 credit hours]
Study of major authors, genres, and ideas of the English Renaissance. Individual sections may focus on more specific topics.
Term Offered: Spring, Fall

ENGL 5440 Early 17th Century English Literature
[3 credit hours]
Early and mid-17th Century texts, primarily non-dramatic. Including such authors as Milton, Donne, Jonson, Lanyer, Herrick, Wroth, Herbert, Pulter, Marvell, Bacon, Hobbes, Philips, Browne, Cavendish, and others.
Term Offered: Spring, Fall

ENGL 5500 British Literature: The Romantic Period
[3 credit hours]
Study of major authors and genres of the Romantic period: approximately 1789 to 1837.
Term Offered: Spring, Fall

ENGL 5540 British Literature: The 20th and 21st Centuries
[3 credit hours]
Study of major authors, genres, and ideas of 20th-century and 21st-century British literature.

ENGL 5550 Literature of the British Empire, Beginnings to 1850
[3 credit hours]
Study of the development of race, empire, and colonialism through literary texts written in (or translated into) English from the late-thirteenth century to the abolition of the British slave trade in the early-nineteenth.
Term Offered: Spring, Fall

ENGL 5560 Literature of the British Empire 1850 to The Present
[3 credit hours]
Studies in texts from Britain and its former colonies. Genres may include the novel, travel writing, memoir, and film. Recommended: ENGL 2800 or 3790
Term Offered: Spring, Fall

ENGL 5610 Nineteenth-Century Latino Literature
[3 credit hours]
This course examines the cultural production of Latino peoples in the nineteenth century U.S., the social and cultural impact of colonization in the Southwestern part of the U.S and the Atlantic world, identity formation among Hispanophone Black, Indigenous, and people of color (BIPOC), and what Latinidad looked like in the nineteenth century.
Term Offered: Spring, Fall

ENGL 5620 American Literary Romanticism
[3 credit hours]
American literature from 1798 to 1865, from the beginnings of Romanticism in Bryant and Cooper through the Transcendental movement, with emphasis on Hawthorne, Melville, Stowe and Douglass.
Term Offered: Spring, Fall

ENGL 5630 American Literary Realism
[3 credit hours]
American literature from the post-Civil War period to the early 20th century: some emphasis on naturalism and humor; such writers as Twain, James, Howells, Dreiser and Wharton.
Term Offered: Fall

ENGL 5640 Early 20th Century American Literature
[3 credit hours]
Study of American literature from 1900 to World War II, focusing on literary modernism and its social, political and philosophical contexts.
Term Offered: Spring, Fall

ENGL 5650 African American Writing Before The 20th Century
[3 credit hours]
Study of African American prose, poetry, drama and fiction from 1760 to 1915.
Term Offered: Spring, Fall

ENGL 5660 African American Literature In The 20th and 21st Century
[3 credit hours]
A course focused on 20th and 21st century African American poetry, fiction, nonfiction, and drama.
Term Offered: Spring, Summer, Fall

ENGL 5670 Asian American Literature
[3 credit hours]
A study of the diverse traditions and key debates in Asian American and Transpacific literature.
Term Offered: Spring, Fall

ENGL 5680 American Literature Since World War II
[3 credit hours]
Major trends in postwar American literature, including traditional and uncanonical writers. Emphasis may be on poetry or prose by instructor's option.
Term Offered: Spring, Fall

ENGL 5750 History Of Literary Criticism
[3 credit hours]
A chronological examination of literary criticism, analyzing the variety of claims and practices which contribute to the current frameworks used to interpret and analyze literary texts.
Term Offered: Spring, Fall

ENGL 5780 Contemporary Literary Theories And Criticism
[3 credit hours]
An intensive examination of contemporary literary theories and criticism, focusing on selected issues and on representative theorists and critics.
Term Offered: Spring

ENGL 5790 Approaches To Research In English
[3 credit hours]
An introduction to the discipline(s) of English, the methods and resources of scholarship in the field.
Term Offered: Fall

ENGL 5800 Chaucer
[3 credit hours]
A study of Chaucer¿s major works and historical contexts, with emphasis on either Troilus and Criseyde and the dream visions, or on The Canterbury Tales in their entirety.
Term Offered: Spring, Fall

ENGL 5810 Shakespeare
[3 credit hours]
A study of Shakespeare's plays with emphasis on his development as a dramatist and with readings in major Shakespearean criticism.
Term Offered: Spring, Fall

ENGL 5820 Milton
[3 credit hours]
A study of the poetry and selected prose. Particular attention is given to biography and criticism.
Term Offered: Spring, Fall

ENGL 5850 Studies In The Work Of A British Author
[3 credit hours]
Author changes with each offering. Consult Time Schedules for authors to be studied.
Term Offered: Spring, Fall

ENGL 5860 Studies In The Work Of An American Author
[3 credit hours]
Author changes with each offering. Consult Time Schedules for authors to be studied.
Term Offered: Spring, Fall

ENGL 5980 Special Topics
[3 credit hours]
Consideration of a special topic in literature and language.
Term Offered: Spring, Fall

ENGL 6010 Teaching College Composition
[3 credit hours]
For prospective college instructors of composition. Includes supervised teaching of composition. Graded S/U only.
Term Offered: Fall

ENGL 6180 Research Methods in Writing Studies
[3 credit hours]
Students will learn and practice research methods commonly used in writing studies, including but not limited to rhetorical analysis, discourse analysis, case studies, and ethnographic research methodologies, to write a substantial research proposal. Time will also be devoted to address how research methods are used in classroom settings.
Term Offered: Fall

ENGL 6190 Environments For Esl Learning
[3 credit hours]
In the course, students learn how to identify English as a Second Language learners' linguistic needs and to design and evaluate environments for ESL learning.
Prerequisites: ENGL 3150 with a minimum grade of D- or ENGL 5150 with a minimum grade of D- or ENGL 7150 with a minimum grade of D- or LING 3150 with a minimum grade of D- or LING 5150 with a minimum grade of D- or LING 7150 with a minimum grade of D-
Term Offered: Fall

ENGL 6410 Seminar: Studies In Early English Literature
[3 credit hours]
Seminar on a specialized topic in Old and/or Middle English literature.
Term Offered: Spring, Fall

ENGL 6420 Seminar: Studies In English Renaissance Literature
[3 credit hours]
Seminar on a specialized topic in English Renaissance literature.

ENGL 6440 Seminar: Studies In Early 17th Century Literature
[3 credit hours]
Seminar on a specialized topic in early 17th century English literature.
Term Offered: Fall

ENGL 6500 Seminar: Studies In British Romantic Literature
[3 credit hours]
Seminar on a specialized topic in British Romantic literature.

ENGL 6520 Seminar: Studies In Victorian Literature
[3 credit hours]
Seminar on a specialized topic in Victorian literature.
Term Offered: Spring, Fall

ENGL 6620 Seminar: Studies In American Literary Romanticism
[3 credit hours]
Seminar on a specialized topic in American literary Romanticism.

ENGL 6630 Seminar: Studies In American Literary Realism
[3 credit hours]
Seminar on a specialized topic in American literary realism.

ENGL 6640 Seminar: Studies In 20th Century American Literature
[3 credit hours]
Seminar on a specialized topic in 20th century American literature.
Term Offered: Spring, Fall

ENGL 6890 Certificate Capstone
[3 credit hours]
This course completes the certificate program. Students will fulfill research on writing piloted in ENGL 6180, culminating in a research essay that will be submitted for publication to an appropriate scholarly journal.
Prerequisites: (ENGL 5090 with a minimum grade of D- and ENGL 5780 with a minimum grade of D- and ENGL 6010 with a minimum grade of D- and ENGL 6180 with a minimum grade of D-)
Term Offered: Spring, Summer, Fall

ENGL 6940 Internship in English as a Second Language
[2 credit hours]
Supervised practice teaching in the form of a community-service internship in English as a Second Language. Must be taken twice with different content. Graded S/U only.
Term Offered: Spring, Fall

ENGL 6960 Master's Research
[1-3 credit hours]
Research on, and writing of the master's paper or thesis.
Term Offered: Spring, Summer, Fall

ENGL 6970 Master's Thesis
[1-3 credit hours]
Research on and writing of the master's thesis in the concentration in English as a Second Language.
Term Offered: Spring, Summer, Fall

ENGL 6980 Seminar: Literary Types And Special Topics
[3 credit hours]
Seminar on a specialized topic in English studies.
Term Offered: Spring, Summer, Fall

ENGL 6990 Independent Study
[1-3 credit hours]
By permission of department; may be repeated for additional credit.
Term Offered: Spring, Summer, Fall

ENGL 8990 Independent Study
[1-3 credit hours]
By permission of department; may be repeated for additional credit.
Term Offered: Spring, Fall

Entrepreneurship, Family and Small Business (EFSB)

EFSB 6590 New Venture Creation
[3 credit hours]
Course addresses the issues faced in starting a new venture, including the identification of new business opportunities and the effective and efficient evaluation of the economic feasibility of these opportunities.
Term Offered: Spring, Fall

EFSB 6690 Strategic Management of Innovation
[3 credit hours]
The course addresses the entire commercialization process from an innovative idea to market. Students will learn how organizations can increase innovative productivity to develop an understanding of strategic management.
Term Offered: Spring, Fall

EFSB 6900 Cannabis Entrepreneurship
[3 credit hours]
EFSB 4900/6900 is an entrepreneurship course with a core focus on business verticals in the cannabis industry. The course will cover a substantial body of knowledge, concepts and tools that entrepreneurs need to know prior to and while starting their new ventures.
Term Offered: Spring, Fall

Executive MBA (EMBA)

EMBA 5500 Analytical Foundation For Executives
[3 credit hours]
This course provides executives with the analytical foundations in accounting, economics, computer skills and statistical method. Students are required to complete exercises as foundations for future courses in the EMBA curriculum. Each subject is a separate track.
Term Offered: Spring, Summer, Fall

EMBA 6140 Financial Foundations For Executives
[3 credit hours]
This course presents analytical tools and their applications to make decisions from financial managers point of view. Topics includes time value of money, risk-return trade-off, capital budgeting, and financial options.
Prerequisites: EMBA 5500 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

EMBA 6220 Accounting For Operational And Strategic Management
[3 credit hours]
This course emphasizes financial and managerial accounting with an emphasis on the use of that information for decision-making and analysis.
Prerequisites: EMBA 5500 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

EMBA 6230 Marketing Analysis And Strategy
[3 credit hours]
This course focuses on what it means to be market#oriented and provides individuals with a basic understanding of the practices needed to create superior customer value. Being 'market oriented' means the organization's decision-making is also driven by customer information, market knowledge, competitive intelligence, an understanding of how the organization creates and delivers value, and a clear set of strategies that differentiate the organization to give it a competitive advantage.
Prerequisites: EMBA 5500 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

EMBA 6250 Leadership And Performance Management
[3 credit hours]
This course is designed to provide a practical understanding of leadership in a variety of organizational settings. Topics and experiences relevant to the main functions of leadership will be discussed and practiced. Specifically, students will develop skills related to managing performance including giving and receiving critical feedback, delegation, managing time and priorities, managing conflict, having difficult conversations, amongst others. Students will assess their personal and interpersonal leadership skills and prepare an individual leadership development plan.
Prerequisites: EMBA 5500 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

EMBA 6290 Strategic Management
[3 credit hours]
This is a capstone course in strategic management. Strategic Management is concerned with a) setting future direction; b) designing strategies to improve performance of organizations; and c) implementing those strategies. The internal resources, capabilities and competencies provide the basis for an organization's strategy, and the impact of external influences from the industry and competitive environment are also critical elements to be considered. The course is designed to help you integrate what you have learned in your separate functional business courses to analyze complex strategic problems and make recommendations. This course adopts a top management perspective in which the organization and its relationships with its external environment are emphasized.
Prerequisites: EMBA 5500 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

EMBA 6300 Information Technology Management
[3 credit hours]
This course equips students with the knowledge and skills to leverage Information Technology (IT) for strategic advantage in today's fast-paced business environment. The course focuses on the strategic/managerial IT topics, such as IT and business goal alignment, digital transformation, data analytics for decision-making, and cybersecurity risks management.
Prerequisites: EMBA 5500 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

EMBA 6310 Global Supply Chain Management
[3 credit hours]
This course presents an integrated approach to value supply chain management and analyzes key challenges, practices, and trends concerning primary business functions and processes. By taking this course, students will learn about the key issues managers need to address when designing, planning, and managing global supply chains.
Prerequisites: EMBA 5500 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

EMBA 6980 Special Topics in Business
[1-3 credit hours]
Analysis of current issues in business, specialized industries, or specfic markets. Syllabus determined jointly by EMBA office and faculty as special topics are identified.

Exercise Science (EXSC)

EXSC 8960 Doctoral Dissertation In Exercise Science
[1-12 credit hours]
Directed research towards completion of the doctoral degree. Students may register for credit in more than one semester. Total dissertation credit toward the degree may not exceed 16 hours.
Term Offered: Spring, Summer, Fall

Faculty Development (FACD)

FACD 6250 Learning/Instruct Theories
[3 credit hours]
Introduction to the fundamental principles of curriculum development and assessment of learning outcomes. Application of the theoretical concepts to the development of curriculum and instructional strategies. The concept of instructional alignment will be at the foundation of various experiences that will expose students to knowledge and skill revelant to the development of instructional units and appropriate evaluation strategies.

FACD 6350 Teach/Learn Hlth Med Sci
[3 credit hours]
Introduction to various theories of teaching and learning. Explores current issues in medical and health science education relative to the theoretical foundations of teaching. Current challenges faced by educators in the health sciences will be discussed and relevant literature reviewed and assessed.

FACD 6700 Teach Improve Practicum
[1 credit hour]
Students evaluate their own teaching and reflect on how they integrate concepts presented in FACD 635 and FACD 625 into their own performance.
Prerequisites: FACD 6350 with a minimum grade of S or FACD 635 with a minimum grade of S
Term Offered: Fall

FACD 6970 Teaching/Learning Project
[3 credit hours]
Students are provided with the opportunity to synthesize the concepts presented and discussed in FACD 625 and FACD 635 into a unique curriculum development or educational research project.
Prerequisites: (FACD 6350 with a minimum grade of S and FACD 6250 with a minimum grade of S) or (FACD 635 with a minimum grade of S and FACD 625 with a minimum grade of S)

Finance (FINA)

FINA 5310 Managerial Finance and Economics
[3 credit hours]
This course combines key elements of economics and financial management for students with limited prior experience in these areas. The economics segment covers both microeconomics, focusing on individual and firm-level decision-making, and macroeconomics, addressing broader economic policies and issues like unemployment and inflation. In the financial management portion, students will learn essential skills for financial analysis, investment decisions, understanding the time value of money, and exploring stock and bond valuation. The course emphasizes the interplay between economic principles and financial strategies, preparing students for effective decision-making in business contexts.
Prerequisites: ACCT 5000 (may be taken concurrently) with a minimum grade of C or BUAD 2040 (may be taken concurrently) with a minimum grade of C and BUAD 2050 (may be taken concurrently) with a minimum grade of C or ACTG 1040 (may be taken concurrently) with a minimum grade of C and ACTG 1050 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6130 Advanced Corporate Finance
[3 credit hours]
The course emphasizes the application of financial decision making tools, techniques and theory. Specific topics include advanced capital budgeting, cost of capital, enterprise valuation, mergers and acquisitions, real options and corporate governance.
Prerequisites: BUAD 6200 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6140 Investments And Security Analysis
[3 credit hours]
This course covers portfolio analysis and asset pricing models such as CAPM, APT, and index models. It also examines bond and stock valuation. In addition, it discusses investment characteristics of individual securities and markets in which these securities are traded, as well as performance evaluation of portfolios.
Prerequisites: FINA 5310 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6150 Financial Institutions And Markets
[3 credit hours]
This course covers operations of financial institutions and financial markets. Topics include interest rate theory, the monetary policy of the Federal Reserve, financial instruments characteristics, banking management, and internationalization.
Prerequisites: FINA 5310 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6340 Derivative Securities
[3 credit hours]
It examines the valuation of and institutional characteristics of derivative securities such as options, futures, forward contracts, and swaps among others. The course covers the Black-Scholes and binomial option-pricing models. It also introduces the risk management aspect of derivative securities.
Prerequisites: FINA 5310 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6370 MBA International Financial Management
[3 credit hours]
Techniques and theory of financial management in an international environment. The role of international markets in risk reduction and profit maximization are emphasized.
Prerequisites: FINA 5310 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6480 Student Managed Portfolio
[3 credit hours]
Course provides selected students active portfolio management training utilizing an endowed portfolio. Student Portfolio Managers apply equity selection analysis and portfolio risk analytics, with fiduciary responsibilites.
Prerequisites: FINA 5310 with a minimum grade of C or FINA 3480 with a minimum grade of C
Term Offered: Spring, Fall

FINA 6750 Research In Finance
[1-3 credit hours]
This course fullfils the need for students who would like to do research on specific area of finance supervised by a faculty member.
Prerequisites: BUAD 6200 with a minimum grade of C
Term Offered: Spring, Summer, Fall

FINA 6890 Financial Modeling
[3 credit hours]
This course is a technical introduction to Excel with a particular emphasis on building financial models and learning practical Excel. We will cover time value of money, capital budgeting, and firm valuation. We will build detailed pro forma financial statements for estimating firm value and capital constraints. We will manipulate and analyze datasets using PowerPivot and PowerBI, and learn how to import data from non-excel data sources. We will briefly cover the Visual Basic language in order to program custom macros. Finally, students will build a personal financial workbook that includes a monthly and annual budget and retirement plan.
Prerequisites: FINA 5310 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Summer, Fall

Foreign Language (FLAN)

FLAN 5160 Teaching Colloquia
[3 credit hours]
A course in the theory of second language acquisition and practice of teaching foreign / second languages in general.
Term Offered: Spring, Summer, Fall

FLAN 5980 Special Topics
[3 credit hours]
Study of a selected topic in foreign languages. Taught in English. May be repeated when topic varies. 3 Credit hours/contact hours
Term Offered: Spring, Fall

FLAN 5990 Independent Study in World Languages and Cultures
[3 credit hours]
Independent study of a selected topic in foreign languages, developed in consultation with a faculty member. May be repeated when the topic varies. 3 hours.
Term Offered: Spring, Summer, Fall

French (FREN)

FREN 5010 Advanced French Grammar I
[3 credit hours]
Advanced study of structural and stylistic principles of French with emphasis on longer writing activities and various styles.
Term Offered: Spring

FREN 5020 Advanced French Grammar II
[3 credit hours]
Advanced study of structural and stylistic principles of French with emphasis on longer writing assignments.
Term Offered: Spring

FREN 5070 French Translation
[3 credit hours]
Practice in translation of texts from French into English and English into French. Subject matter area will include commerce, natural, physical, and social sciences and the humanities.

FREN 5160 Teaching Colloquia
[3 credit hours]
A course in the theory of second language acquisition and practice of teaching foreign / second languages in general.
Term Offered: Spring, Summer, Fall

FREN 5200 Contemporary French And Francophone Civilization
[3 credit hours]
A study of contemporary France and/or Francophone cultures including discussion of economics, daily life, the family, social groups, industry, politics and education.
Term Offered: Spring, Fall

FREN 5210 French For Reading Knowledge I
[3 credit hours]
Course designed to develop sufficient reading proficiency to conduct and process research in French. (Not for majors)
Term Offered: Spring, Fall

FREN 5310 Medieval Studies
[3 credit hours]
Introduction to Old French and readings in the major genres from the twelfth through fifteenth centuries.
Term Offered: Fall

FREN 5410 Renaissance Studies
[3 credit hours]
Literature reflecting major currents of the Renaissance.
Term Offered: Spring, Fall

FREN 5510 17th Century French Literature
[3 credit hours]
A study of the development of French Classicism.
Term Offered: Spring, Fall

FREN 5610 18th Century French Literature
[3 credit hours]
Readings from the novels, plays and prose of the major writers of the Enlightenment.
Term Offered: Fall

FREN 5710 19th Century French Literature I
[3 credit hours]
Literary and intellectual trends from Romanticism to Symbolism.

FREN 5810 Contemporary French & Francophone Literature I
[3 credit hours]
Literature of all genres from the period before World War I to the present.
Term Offered: Spring, Fall

FREN 5860 La Production Feminine
[3 credit hours]
This course deals with examples of feminine production which have influenced French culture in the areas of film, literary criticism, literature, philosophy, psychoanalysis and semiotics.
Term Offered: Fall

FREN 5980 Special Topics In French Studies
[3 credit hours]
Study of a selected topic in French or Francophone language, literature, or culture. May be repeated when topic varies.
Term Offered: Spring

FREN 5990 Independent Study In French
[1-3 credit hours]
Independent research in special topics. May be repeated once for additional credit.

FREN 6900 Research In French
[1-3 credit hours]
Independent research of a selected topic in French or Francophone language, literature, or culture. May be repeated once for additional credit.
Term Offered: Spring, Summer, Fall

General Engineering (GNEN)

GNEN 5000 Graduate Launch
[0-2 credit hours]
The courses addresses specific requirements for graduate degrees in COE as well as more general requirements for successful careers as professional engineers. Content to be discussed includes University paperwork and progress towards degree; professionalism; research initiation (literature searches, research database, endnote); professional writing; career preparation; and developing professional relationships.
Term Offered: Spring, Fall

GNEN 5200 Advanced Mechanical Design
[3 credit hours]
Design and application of mechanical components and machine elements including shafts, gears, gear drives, belt drives, chain drives, fasteners, power screws, clutches, brakes and machine frames.
Term Offered: Spring, Summer, Fall

GNEN 5500 Applications of Engineering Analysis
[3 credit hours]
A course in analysis for engineers. Topics include: Linear differential equations, continuous and discrete series representation. Laplace transforms, matrix methods, eigenvalues and eigen vectors, systems of equations.
Term Offered: Spring, Fall

GNEN 5700 Applied Probability and Statistics
[3 credit hours]
An introduction to the application of descriptive and inferential statistics. Topics include probability distributions, confidence intervals, tests of hypotheses, linear regression and correlation and the use of statistical software.
Term Offered: Spring

GNEN 6200 Environmental Efficiency for Buildings
[3 credit hours]
This course is an in-depth study of the latest advances in efficient energy and environmental design and operation of commercial, industrial, and institutional building as defined by the United States Green Building Council. Topics include selection of building sites considering the interaction with mass or local transportation, water efficiency of both potable and waste water streams, energy efficiency as it relates to the building systems and construction including lighting and power generation, atmospheric effects including combustion wastes and refrigerant selection, building construction materials that reflect sustainable resources, and building indoor air quality. Upon completion, students are prepared to take the accreditation exam for LEED-GA, LEED-AP or both from the USGBC.
Term Offered: Spring, Fall

GNEN 6300 Energy Management for Facilities
[3 credit hours]
This course provides students with a working knowledge of energy management as it applies to industrial, commercial, and institutional entities; buildings, processes, equipment, and systems. It involves the strategic evaluation of energy use and planning for energy efficiency. This course prepares the student for executing duties of a certified energy manager in facilities management for entities that have appreciable energy and power requirements. The course follows a national program of preparedness to take the Certified Energy Managers exam from the Association of Energy Engineers (AEE CEM Certification). An energy manager evaluates energy use and designs energy programs that increase efficiency and reduce energy-related costs. They design processes, retrofit buildings and equipment, and plan energy-related systems for new projects. Energy managers may be responsible for improving the efficiency of combustion systems, lighting, water systems, and electrical power.
Term Offered: Summer, Fall

GNEN 6700 Management of Projects and Technological Innovation
[3 credit hours]
Study of industry project management principles, methodologies, and processes while integrating the advancement of technological innovation to execute a project on time and on budget. The course incorporates real time industry project case studies while blending in the traditional techniques of using project management standards and templates, scheduling and cost tools, project selection and organizational development, work management and asset management. Applications to the energy and utility sectors, including project manager interactions with private industry and government/regulatory bodies, are used to highlight project management concepts and define leadership styles.
Term Offered: Fall

GNEN 6920 Special Projects in Engineering
[1-6 credit hours]
A special project is intended for the graduate student to investigate or solve a problem in an engineering area. The scope of the project is defined by the instructor in an area of mutual interest of the instructor and the student.
Term Offered: Spring, Summer, Fall

GNEN 6980 Special Topics in Engineering
[0-6 credit hours]
A special topic at the graduate level in engineering to be offered as a course during a term by a faculty member.
Term Offered: Spring, Summer, Fall

Geography and Planning (GEPL)

GEPL 5040 Geography Education Strategies
[3 credit hours]
Graduate level preparation for K - 12 educators with geography specialization. Integrates social studies and standard geography curricula in response to state and federal mandates.
Term Offered: Fall

GEPL 5110 Geographic Information Systems
[3 credit hours]
Introduction to computerized methods for the capture, storage, management, analysis and display of spatially-referenced data for the solution of planning, management and research problems.
Term Offered: Spring, Summer, Fall

GEPL 5160 Patterns Of World Development
[3 credit hours]
Examination of contemporary global economic patterns and trends. Topics receiving special attention include population problems, the spread of multinational corporations, and the causes and consequences of the emergence of postindustrial economics.
Term Offered: Fall

GEPL 5180 Geographic Information Systems Applications
[3 credit hours]
Advanced applications in geographic information systems (GIS) with an emphasis on advanced GIS analysis techniques, Global Positioning System applications in GIS, database design, and a survey of vector- and raster-based GIS software and databases. Research project required.
Prerequisites: GEPL 5110 with a minimum grade of D- or GEPL 4110 with a minimum grade of D-
Term Offered: Spring

GEPL 5210 Land Use Planning
[3 credit hours]
A broad review of urban and regional planning in the US and Western Europe, introducing land use planning concepts and practices and their role in shaping the direction of urban development.
Term Offered: Spring

GEPL 5300 GIS Programming
[3 credit hours]
Introduction to computer programming languages that can customize and expand the capability of geospatial science and technology (GIS&T). Major topics include programming fundamentals, Python, ArcPy, Jupyter, and their applications.
Prerequisites: GEPL 2020 with a minimum grade of D- and GEPL 4110 with a minimum grade of D-
Term Offered: Spring

GEPL 5310 Geography of Gypsies (Romanies) and Travelers
[3 credit hours]
Explorations into identities and distributions of Gypsies (Romanies) and Travelers (GR&T peoples) worldwide and the challenges that their study presents to Geography and to other social science desciplines.
Term Offered: Spring, Summer, Fall

GEPL 5400 GeoAI and Machine Learning
[3 credit hours]
Introduction to the concepts, principles, methods, and tools of artificial intelligence (AI), machine learning (ML), and deep learning (DL) in the geosciences. As an advanced GIS&T programming course, this course exhibits wide applications and promising potentials of AI, ML, and DL in solving real-world problems.
Prerequisites: GEPL 4110 with a minimum grade of D- and GEPL 4300 with a minimum grade of D-
Term Offered: Fall

GEPL 5420 Quantitative Methods in Geographic Research
[3 credit hours]
An examination of quantitative methods commonly used in geographic research with an emphasis on spatial statistics and cartographic analysis.
Term Offered: Fall

GEPL 5490 Remote Sensing Of The Environment
[3 credit hours]
Introduction to theory, methods and techniques used to gather and analyze remote sensor data. Topics range from low altitude air photo interpretation through satellite image acquisition. Recommended: GEPL 3550.
Term Offered: Fall

GEPL 5500 Digital Image Analysis
[3 credit hours]
Using imagery captured by earth orbiting satellites, students will document changes on the surface of the earth addressing environmental issues. Students will have the opportunity to learn applications of this technology including project based work in the classroom.
Prerequisites: GEPL 4490 with a minimum grade of D- or EEES 4490 with a minimum grade of D- or GEPL 5490 with a minimum grade of C or EEES 5490 with a minimum grade of C
Term Offered: Spring

GEPL 5520 Analytical And Computer Cartography
[3 credit hours]
The theoretical and mathematical foundations of the mapping process in a digital environment. An introduction to the structure and manipulation of graphic and nongraphic geographical data to produce maps.
Prerequisites: GEPL 4110 with a minimum grade of D- and GEPL 5110 with a minimum grade of C
Term Offered: Spring

GEPL 5530 Principles Of Urban Planning
[3 credit hours]
Elaborations on planning theory. The planner's role in land use regulation, economic development, housing and social service delivery is reviewed.
Term Offered: Fall

GEPL 5540 Weather And Climate
[3 credit hours]
Survey analysis of meteorology and climatology. The physical processes of weather and the pattern of climate provide the basis for this course.
Term Offered: Summer, Fall

GEPL 5570 Land Development And Planning
[4 credit hours]
The exploration of theoretical location analysis, pragmatic land development issues and analytic feasibility tools, and the consequences of land use policies that affect development.
Term Offered: Spring

GEPL 5580 Location Analysis
[4 credit hours]
The application of geographic location theory, spatial interaction modeling, optimization techniques and geographic information system processing to the solution of facility location problems.
Prerequisites: GEPL 5570 with a minimum grade of D-
Term Offered: Spring

GEPL 5600 Urban Design
[3 credit hours]
Concepts and procedures for the organization, design and development of public and private urban forms and spaces at the micro-level, including a survey of intraurban elements, cultural, ecological and aesthetic considerations, historic preservation, and interdisciplinary collaboration. Research project required.
Term Offered: Fall

GEPL 5650 Geography of Earth Systems
[3 credit hours]
Using an Earth System Science approach linking the hydrosphere, biosphere, atmosphere, and lithosphere, students will explorer the relationship and spatial characteristics of events such as hurricane landfall, volcanic eruptions and climate change.
Term Offered: Spring

GEPL 5700 Community Planning Workshop
[3 credit hours]
This course introduces the skills and techniques used by practitioners in the planning process. Assignments will focus on the collection, analysis and communication of information by following community planning approaches.
Term Offered: Spring

GEPL 5710 Urban Geography
[3 credit hours]
Geographic perspectives on the social, political and economic functions of cities. Issues of land use, redevelopment, residential and commercial geographies are examined in contemporary North American cities.
Term Offered: Spring, Fall

GEPL 5750 Transportation Geography
[3 credit hours]
The role of transportation and communication in the economic development of places. Theories of geographic interaction, location of transport routes and the developmental implications of transport investments are explored.
Term Offered: Spring, Fall

GEPL 5800 Geospatial Science Research
[3 credit hours]
A seminar/capstone course to guide students in integrating Geographic Information Science and Technology (GIS&T) knowledge, exploring research questions, conducting research projects, and composing journal-standard articles.
Prerequisites: GEPL 4110 with a minimum grade of D- and GEPL 4300 with a minimum grade of D- and GEPL 4400 with a minimum grade of D-
Term Offered: Spring

GEPL 5810 Political Geography
[3 credit hours]
Space and place facets of population size, growth, migration, distribution and composition with emphasis on the population trends and patterns in both developing and developed nations.
Term Offered: Spring, Fall

GEPL 5910 Directed Research
[1-3 credit hours]

GEPL 5920 Readings in Geography
[1-3 credit hours]

GEPL 6100 Philosophy & General Methodology
[3 credit hours]
Past and current trends in geographic thought and related methodological implications, with elaborations by current faculty members.
Term Offered: Fall

GEPL 6150 Seminar In Research Methods
[3 credit hours]
A computer-based course in geographic research methodology. The course includes an introduction to research design, data measurement, spatial sampling and multivariate approaches to the study of areal networks and spatial distributions.
Term Offered: Spring, Fall

GEPL 6530 Seminar-Urban/Regional Planning Applications
[3 credit hours]
The course applies forecasting and projection techniques to urban and regional problems. Population, economic base, land use, retail and fiscal impact analyses are examined.

GEPL 6550 Seminar In Environment Planning
[3 credit hours]
Intensive group study of major goals and methodologies of environmental planning. Major emphasis is placed upon individual student research projects oriented toward specific environmental planning problems.

GEPL 6700 Teaching Practicum In Geography
[1-6 credit hours]
Methods of teaching geography in a university of college setting. Supervision of labs or discussion.
Term Offered: Spring, Summer, Fall

GEPL 6890 Professional Development in Geography and Planning
[3 credit hours]
Study of professional practices, knowledge, and skills required for pursuing opportunities in the public or private sector in geography and planning, including important issues of considering career planning, networking, ethics, writing and publishing.
Term Offered: Spring

GEPL 6910 Comprehensive Exam Preparation
[2 credit hours]
The course is used for the completion of the comprehensive exam requuirement for M.A candidates.
Prerequisites: (GEPL 6100 with a minimum grade of D- and GEPL 6150 with a minimum grade of D-)
Term Offered: Spring, Fall

GEPL 6920 Research Design
[3 credit hours]
The course will have students prepare all the main components of a thesis proposal leading to the completion presentation of the proposal to their thesis advisory committee.
Term Offered: Spring

GEPL 6930 General Seminar
[3 credit hours]

GEPL 6940 Internship In Planning
[1-6 credit hours]
Professional work experience with a Greater Toledo planning organization related to academic education.
Term Offered: Spring, Summer, Fall

GEPL 6950 Applied Geographic Workshop
[3 credit hours]
Capstone course for GIS/Applied Geographics certificate program to provide hands-on experience in applying GIS, remote sensing and desktop mapping systems to spatially-oriented problems that are unique to their individual disciplines.
Term Offered: Spring, Fall

GEPL 6960 Thesis
[1-6 credit hours]
Work on a thesis is the culmination of graduate education and occupies most of the second year.
Term Offered: Spring, Summer, Fall

German (GERM)

GERM 5010 German Syntax And Stylistics I
[3 credit hours]
A review of German stylistic structures through the analysis of texts and written and oral exercises.
Term Offered: Fall

GERM 5020 German Syntax And Stylistics II
[4 credit hours]
Further review of German stylistic structures through the analysis of texts and written and oral exercises.
Prerequisites: GERM 5010 with a minimum grade of D-
Term Offered: Spring

GERM 5160 Teaching Colloquia
[3 credit hours]
A course in the theory of second language acquisition and practice of teaching foreign / second languages in general.
Term Offered: Spring, Summer, Fall

GERM 5190 Study Abroad
[1-12 credit hours]
Graduate credit may be granted for foreign study on the basis of credentials that certify the nature of the student's academic achievements in a German-speaking country.
Term Offered: Summer

GERM 5200 German Culture And Civilization
[3 credit hours]
Study of major trends and current developments in German Landeskunde. May be repeated when topic varies.
Term Offered: Spring, Fall

GERM 5210 German For Reading Knowledge I
[3 credit hours]
Elements of pronunciation, structure and vocabulary most appropriate to preparing graduate students to read effectively in German. (Not for major credit).
Term Offered: Spring

GERM 5620 German Classicism
[3 credit hours]
Study of Classical writers of Germany: Goethe, Schiller and their contemporaries.
Term Offered: Spring, Fall

GERM 5710 German Literature Of The 19th Century
[3 credit hours]
Study of selected works by authors from B¿chner to Fontane.
Term Offered: Spring

GERM 5720 German Romanticism
[3 credit hours]
Study of Romantic writers of Germany such as Novalis, Eichendorff, E.T.A. Hoffmann and Bettina Brentano.

GERM 5810 German Literature Of The 20th Century
[3 credit hours]
Study of selected works by authors from the turn of the century to the present.
Term Offered: Spring, Fall

GERM 5850 Genre Studies
[3 credit hours]
Study of a selected literary or film genre, its development, and its influence on German culture. May be repeated for credit when topic varies.
Term Offered: Spring, Fall

GERM 5980 Special Topics In German Studies
[1-3 credit hours]
Study of a selected topic in German language, literature, or culture. May be repeated for credit when topic varies.
Term Offered: Spring, Summer, Fall

GERM 5990 Independent Study In German
[1-3 credit hours]
Independent research in special topics. May be repeated once for additional credit.
Term Offered: Spring, Summer, Fall

GERM 6900 Research In German
[1-3 credit hours]
Independent research of a selected topic in German language, literature, or culture. May be repeated once for additional credit.
Term Offered: Spring, Summer, Fall

GERM 6930 Seminar: Selected Topics
[1-3 credit hours]
Study of selected topics in German language, literature, or culture. May be repeated once for additional credit.
Term Offered: Spring, Summer

Health Education (HEAL)

HEAL 5750 Obesity And Eating Disorders
[3 credit hours]
Examines the issues of obesity and eating disorders. Consideration of effects on the individual as well as the public health implications. Explores causes, health and emotional impact, and treatment approaches.
Term Offered: Summer, Fall

HEAL 5960 Political Determinants of Health
[3 credit hours]
An examination of the political determinants of health, that is, the upstream political forces and policy decisions that are the causal sources of the social conditions that lead to health inequities. This course introduces the importance of power, politics, advocacy, and policy in public health. Students will learn models of health equity and the political determinants of health and apply these to contemporary case studies with particular attention to the health effects of racism.
Term Offered: Spring, Fall
Multicultural US Diversity

HEAL 6880 Scientific Writing In Health
[3 credit hours]
An exploration of types of program evaluation, evaluation models, data collection, types of data, data quality, evaluation reports, standard data collection instruments and ethical issues in health program evaluation.
Term Offered: Spring, Fall

HEAL 6900 Grant Writing In Health Sciences
[3 credit hours]
Consideration is given to funding sources, proposal guidelines, procedures for support, budgetary requirements and evaluation procedures. Students examine different types of funded projects, develop a research prospectus and grant proposal, and explore the art of politics and grantsmanship.
Prerequisites: (RESM 6320 with a minimum grade of D- and HEAL 6800 with a minimum grade of D-)
Term Offered: Spring, Fall

HEAL 6990 Independent Study In Health Education
[1-3 credit hours]
This independent study provides an opportunity for a single student to engage in advanced, focused study of a selected topic in health education under faculty supervision. The content, learning activities, and deliverables are individualized and determined collaboratively by the student and instructor. Credit hours reflect the scope and intensity of scholarly work completed during the semester
Term Offered: Spring, Summer, Fall

HEAL 8080 Social Determinants of Health
[3 credit hours]
Social determinants of health are social conditions, factors, and systems that place people from different socio-demographic and socioeconomic group (social class, gender, race/ethnicity, and place of birth) at differential risk of poor health and premature mortality. Mechanisms through which these factors are hypothesized to influence health, such as stress and access to health resources and constraints, will be discussed, as well as the ways in which these mechanisms can operate across the life course.
Term Offered: Spring, Fall

HEAL 8310 Public Health Assessment and Planning
[3 credit hours]
This course introduces the principles of health promotion program assessment and planning. Students learn the process of community health assessment, precursors to program planning, as well as the purposes, procedures, terminology, and specific techniques in the planning process.
Term Offered: Fall

HEAL 8320 Implementation of Public Health Programs
[3 credit hours]
This course is designed to prepare students to implement health education programs in the community. Emphasis will be placed on a variety of health education methods and strategies to plan, promote, present and evaluate health promotion activities.
Prerequisites: HEAL 8310 with a minimum grade of D-
Term Offered: Spring

HEAL 8360 Applied Survey Research In Health
[3 credit hours]
An examination of applied survey research techniques essential in conducting health-related surveys. Topics will include standard health survey instruments, sample selection, quality instruments, response rates and data presentation for publication.
Term Offered: Spring, Fall

HEAL 8800 Evaluation Of Health Programs
[3 credit hours]
An exploration of types of program evaluation, evaluation models, data collection, types of data, data quality, evaluation reports, standard data collection instruments and ethical issues in health program evaluation.
Prerequisites: HEAL 8460 with a minimum grade of D-
Term Offered: Spring, Fall

HEAL 8960 Doctoral Research Dissertation
[1-12 credit hours]
Graduate students may register for credit in more than one semester. Dissertation credit toward the degree program may not exceed 16 hours.
Term Offered: Spring, Summer, Fall

HEAL 8990 Independent Study In Health Education
[1-3 credit hours]
This independent study provides an opportunity for a single student to engage in advanced, focused study of a selected topic in health education under faculty supervision. The content, learning activities, and deliverables are individualized and determined collaboratively by the student and instructor. Credit hours reflect the scope and intensity of scholarly work completed during the semester
Term Offered: Spring, Summer, Fall

Health Science & Human Service (HSHS)

HSHS 8000 Statistics and Research for Health Science and Human Service Professions
[3-5 credit hours]
An interdisciplinary course covering basic statistics and related research design with specific applications in various health sciences and human service professions.
Term Offered: Spring, Summer, Fall

Higher Education (HED)

HED 5900 Diversity Leadership in Higher Education
[3 credit hours]
Diversity Leadership in Higher Education explores issues of diversity on campuses through foundational and contemporary lenses. It is intended for students studying higher education as a major or area of research interest, as well as employees in institutions of higher education at all levels. The course defines diversity in higher education settings and explores diversity through student, faculty, and administrative lenses, including the components of an effective diversity office on campus.
Term Offered: Spring, Summer, Fall

HED 5980 Special Topics In Higher Education
[1-3 credit hours]
This seminar provides advanced study in special topics of interest to faculty and administrators in higher education.
Term Offered: Summer, Fall

HED 6010 History Of Higher Education
[3 credit hours]
Introduction to the historical development of American higher education from colonial times to the 20th century. Emphasis on the major historical events that contributed to the diversity of higher education.
Term Offered: Summer, Fall

HED 6120 International Education
[3 credit hours]
Complex interrelationships between global and educational systems will be examined. Emphasis will be on how education can be used to build a more global society. Some sections will include an international field study trip.
Term Offered: Spring, Summer, Fall

HED 6510 The American College Student
[3 credit hours]
This course explores the character and nature of student populations in contemporary American colleges and universities and considers the impact of campus environments and experiences on development, interaction and learning.
Term Offered: Spring, Fall

HED 6530 Theories Of Student Development
[3 credit hours]
Students critically examine traditional and contemporary theories of college student development, identify methods of assessing that development, and explore ways to apply the theories to everyday practice.
Term Offered: Spring, Summer, Fall

HED 6570 Research in Higher Education
[3 credit hours]
The course introduces students to research methods and techniques, along with the resources available, both within the University and nationally, for the purpose of higher education research. Introductory qualitative and quantitative research concepts are covered, as well as how to critique research articles in the field of higher education.
Term Offered: Spring, Summer, Fall

HED 6640 Governance And Administration In Higher Education
[3 credit hours]
This course introduces students to the theories and structures of the governance and administration of academic organizations, and to the sources of authority and decision-making in academic institutions.
Term Offered: Spring, Fall

HED 6700 Finance Of Higher Education
[3 credit hours]
This course discusses issues related to the expenditure of funds for higher education within institutions and systems. issues addressed include capital funding, endowment management and budget preparation.
Term Offered: Spring, Summer, Fall

HED 6730 Legal Aspects Of Higher Education
[3 credit hours]
Law, its history, philosophy and practical application to and effect on the creation and administration of public and private higher education is examined in the context of court decisions.
Term Offered: Spring, Fall

HED 6770 Evaluation And Outcomes Assessment In Higher Education
[3 credit hours]
This course focuses on outcomes-based assessment of learning and development in student affairs.
Term Offered: Spring, Summer, Fall

HED 6850 Critical Issues In Higher Education
[3 credit hours]
This seminar exposes students to critical issues in higher education. Topics covered vary from course to course in order to stay current with ongoing and emerging critical issues.
Term Offered: Spring, Summer, Fall

HED 6940 Master's Practicum In Higher Education
[3 credit hours]
The Practicum Seminar provides students with the opportunity to develop specialized skills working in a professional/administrative unit of a college or university. Students are expected to complete a 200 hours of work under the supervision of an experienced administrator. Seminar coursework accompanies the practicum experience.
Term Offered: Spring, Summer, Fall

HED 6960 Master's Thesis In Higher Education
[1-3 credit hours]
Open to graduate students who elect the completion of a research thesis in fulfilling the research requirements of the master's program.
Term Offered: Spring, Summer, Fall

HED 6980 Master's Capstone Seminar
[3 credit hours]
This seminar provides opportunities for students to strengthen their academic and professional skills and to apply them in different higher education contexts. The culminating requirements may vary.
Term Offered: Spring

HED 6990 Independent Study In Higher Education-Masters
[1-3 credit hours]
Provides student the opportunity to work independently on a professional problem under the direction of a Higher Education Program faculty member.
Term Offered: Spring, Summer, Fall

HED 7900 Diversity Leadership in Higher Education
[3 credit hours]
Diversity Leadership in Higher Education explores issues of diversity on campuses through foundational and contemporary lenses. It is intended for students studying higher education as a major or area of research interest, as well as employees in institutions of higher education at all levels. The course defines diversity in higher education settings and explores diversity through student, faculty, and administrative lenses, including the components of an effective diversity office on campus.
Term Offered: Spring, Summer, Fall

HED 7980 Special Topics In Higher Education
[1-3 credit hours]
This seminar provides advanced study in special topics of interest to faculty and administrators in higher education.
Term Offered: Summer, Fall

HED 8010 Historical Foundations of Higher Education
[3 credit hours]
The course provides a comprehensive examination of the foundations of higher education in the United States. Special attention is given to the relationship between higher education and society over time, central philosophical assumptions, key historical and social events that shaped the field, evolving conceptualizations of education, and the higher education diversity of people, institutions, and ideas. The course also aims to equip students with knowledge about historical analysis, and skills to conduct archival research.
Term Offered: Spring, Fall

HED 8030 Federal And State Policy Analysis
[3 credit hours]
Designed for those interested in federal and state policy as related to higher education. Students will investigate specific federal and state legislation and regulatory issues.
Term Offered: Summer

HED 8120 International Education
[3 credit hours]
Complex interrelationships between global issues and educationaal systems will be examined. Emphasis will be on how education can be used to build a more global society. Some sections of the course will include an international field study trip.
Term Offered: Summer

HED 8270 Learning and Teaching in Higher Education
[3 credit hours]
Course facilitates application of theory to practice of teaching in higher education. Students explore diverse pedagogical approaches, professional faculty roles effective learning and teaching.

HED 8530 Research Perspectives on Student Development
[3 credit hours]
This course is designed to enhance students' understanding of the wide array of theories that inform the developmental processes of college students. Special focus falls on recent theories on student learning, growth, and development, including holistic models of development; issues of diversity in development; ways to utilize theory to understand, explain, analyze, and predict behavior; and the extent to which seminal theories and models are used to guide empirical research.
Term Offered: Spring, Summer, Fall

HED 8570 Foundational Seminar in Higher Education
[3 credit hours]
This course provides an introduction to doctoral studies, reviews research approaches in the field of higher education, and initiates students' dissertation research planning. Students learn how to conduct and critique higher education research, what sources of research and databases are available to them, and how to develop and present a research study proposal.
Term Offered: Spring, Fall

HED 8640 Models of University Organization and Governance
[3 credit hours]
This course provides a comprehensive examination of the governance and administration of U.S. colleges and universities, and of the diversity of models of governance available in higher education scholarship. We consider such topics as models of governance, locus of control, shared governance, leadership, community, state, and federal influences on institutional administration, and strategic environments. The course also aims to equip students with analytic skills and perspectives that guide their research and practice of leadership and management.
Term Offered: Spring, Summer, Fall

HED 8650 Community College Leadership
[3 credit hours]
This course examines community college leadership and administration. It introduces models for leading change and explores challenges facing community college leaders.
Term Offered: Summer

HED 8700 Economics and Financing of Higher Education
[3 credit hours]
This course focuses on issues of economics and financing of higher education institutions including historical evolution of funding philosophies, sources of revenue for colleges and universities, expenditure streams and their connection to educational outcomes, institutional budgets, and how sources of funds drive educational policymaking. In addition, the course explores values and concerns of public funding, public and private sector investment in higher education, and the role of fundraising in institutional financing.
Term Offered: Spring, Summer, Fall

HED 8730 Higher Education Law and Policy
[3 credit hours]
This course focuses on a range of constitutional, statutory, case, and common law principles that directly influence higher education policy and the operation of colleges and universities.
Term Offered: Spring, Summer, Fall

HED 8770 Research and Assessment of Student Outcomes in Higher Education
[3 credit hours]
This course examines the philosophy and practice of assessment and evaluation in higher education. Issues to be covered include the Input-Environment-Outcomes model, and planning, implementing, and improving assessment in higher education.
Term Offered: Spring, Summer, Fall

HED 8850 Critical Issues In Higher Education
[3 credit hours]
This seminar exposes students to critical issues in higher education. Topics covered vary from course to course in order to stay current with ongoing and emerging critical issues.
Term Offered: Summer, Fall

HED 8910 Introduction to Interpretive Inquiry
[3 credit hours]
This course equips students with basic knowledge and abilities to conduct qualitative research. It fosters understanding of methodology and methods, and their alignment with a particular research tradition.
Term Offered: Spring, Fall

HED 8920 Advanced Seminar
[3 credit hours]
This seminar requires students to work with a professor on the design and implementation of a research project. This project may be qualitative, quantitative, or mixed method. The seminar may be repeated once for credit when topics vary.
Term Offered: Spring, Fall

HED 8930 Doctoral Research Seminar In Higher Education
[3 credit hours]
This course provides students the opportunity to work through the various stages of their dissertation in a seminar format. This course may be repeated once for credit as students progress through stages of the dissertation. These credits may count towards students' dissertation hours.
Term Offered: Spring, Summer, Fall

HED 8940 Doctoral Internship In Higher Education
[1-3 credit hours]
The Internship provides students an opportunity to accummulate supervised experience in college/university administration or teaching. Areas of experience are decided upon in collaboration with a guiding higher education organization or institution, the faculty in the Higher Education Program, and the individual student.
Term Offered: Summer, Fall

HED 8960 Dissertation
[1-12 credit hours]
Original and specific research problem of a scholarly nature, requiring the application of advanced research skills and techniques to study. Students must take a minimum of 10 dissertation credit hours.
Term Offered: Spring, Summer, Fall

HED 8990 Independent Study In Higher Education
[1-3 credit hours]
Provides student the opportunity to work independently on a professional problem under the direction of a Higher Education Program faculty member.
Term Offered: Spring, Summer, Fall

History (HIST)

HIST 5110 Sports, Race, and Power in Apartheid South Africa
[3 credit hours]
The class aims to interrogate the ways in which politics of sports, race and power, as well as resistance, intersected during the Apartheid era in South Africa, and what the legacies thereof are.
Term Offered: Spring, Fall
Multicultural Non-US Diversity

HIST 5200 Colonial Foundations Of The U.s.
[3 credit hours]
This course analyzes the colonial experience of the United States prior to 1763. It stresses the various cultures and social groups in America and how they related with one another.

HIST 5270 20th Century America, 1920-1945
[3 credit hours]
Social, political and economic development of the United States, 1920-1945. The Republican ascendancy, the car culture, Great Depression, New Deal and World War II.
Term Offered: Fall

HIST 5280 U.s. Since 1945: Affluence And Anxiety
[3 credit hours]
Social, economic and political development of the United States since 1945. The Cold War, McCarthyism, Eisenhower Equilibrium, the New Frontier and the Great Society, civil rights, Watergate and the Reagan Revolution.
Term Offered: Fall

HIST 5360 American Intellectual History I
[3 credit hours]
Development and influence of major ideas from the colonial period to 1865. Topics include Puritanism, the Enlightenment, Democracy and Transcendentalism.
Term Offered: Spring

HIST 5450 United States and Latin America
[3 credit hours]

HIST 5470 Mexico
[3 credit hours]
Mexican history from pre-Hispanic times to the present. Emphasis on the political, social and economic changes imposed by the Spaniards; the legacy of colonialism on the modern nation; the Mexican Revolution and the "Mexican Miracle."
Term Offered: Summer, Fall

HIST 5490 Witchcraft And Magic In Medieval And Early Modern Europe
[3 credit hours]
Witchcraft, religion and magic in western Europe from the 12th through 17th centuries, focusing on the origins of witchcraft belief, diabolical magic, the witchcraze and its decline.
Term Offered: Spring, Fall

HIST 5740 Modern Japanese History
[3 credit hours]
Japan in transition under Western influence, forces leading to the Meiji Restoration, the modernization of Japan, Japan's rise as a world power, war and postwar developments.
Term Offered: Spring, Fall
Multicultural Non-US Diversity

HIST 5980 Special Topics
[1-4 credit hours]
Topics selected by various instructors.
Term Offered: Spring, Fall

HIST 6600 Historiography
[3 credit hours]
The nature of historical writing. Concepts of the historical method. The history of the writing of history from the beginning to the present.
Term Offered: Spring, Fall

HIST 6930 Seminar
[3 credit hours]
Focus on primary research and writing in various fields: 01: 17th and 18th century America, 05: 19th century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 15: 20th century America, 16: Public History, 17: U. S. Bibliography to 1865, 18: U. S. Bibliography since 1865, 35: Latin America, 39: Ancient, 40: Medieval Europe, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Africa, 90: Special Topics
Term Offered: Spring, Fall

HIST 6950 Workshops
[3 credit hours]
Introduction to essential pedagogical and academic skills including survey class design: syllabi, lectures, history writing, theses and prospectuses. And professional skills: constructing a CV, letter of introduction, teaching philosophy, and grant proposals.
Term Offered: Fall

HIST 6960 Thesis
[1-16 credit hours]
M.A. thesis topic to be selected by the student with the approval of the thesis adviser.
Term Offered: Spring, Summer, Fall

HIST 6990 Independent Study
[1-4 credit hours]
Readings: 01: 17th and 18th Century America, 05: 19th Century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 13: Public History, 15: 20th Century America, 16: Business, 17: Peace Movements, 18: Social, 35: Latin America, 40: Medieval Europe, 41: Renaissance and Reformation, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Ancient Greece, 90: Ancient Rome, 92: Africa, 99: Any Title
Term Offered: Spring, Summer, Fall

HIST 8600 Historiography
[3 credit hours]
The nature of historical writing. Concepts of the historical method. The history of the writing of history from the beginning to the present.
Term Offered: Spring, Fall

HIST 8930 Seminar
[3 credit hours]
Focus on primary research and writing in various fields: 01: 17th and 18th century America, 05: 19th century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 15: 20th century America, 16: Public History, 17: U. S. Bibliography to 1865, 18: U. S. Bibliography since 1865, 35: Latin America, 39: Ancient, 40: Medieval Europe, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Africa, 90: Special Topics
Term Offered: Spring, Fall

HIST 8950 Workshops
[3 credit hours]
Introduction to essential pedagogical and academic skills including survey class design: syllabi, lectures, history writing, theses and prospectuses. And professional skills: constructing a CV, letter of introduction, teaching philosophy, and grant proposals.
Term Offered: Fall

HIST 8960 Dissertation
[1-16 credit hours]
Ph.D. dissertation topic to be selected by the student with the approval of the dissertation adviser.
Term Offered: Spring, Summer, Fall

HIST 8990 Independent Study
[1-4 credit hours]
Readings: 01: 17th and 18th Century America, 05: 19th Century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 13: Public History, 15: 20th Century America, 16: Business, 17: Peace Movements, 18: Social, 35: Latin America, 40: Medieval Europe, 41: Renaissance and Reformation, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Ancient Greece, 90: Ancient Rome, 92: Africa, 99: Any Title
Term Offered: Spring, Summer, Fall

Human Donation Science (HDSC)

HDSC 5010 Organ Transplant Procurement
[3 credit hours]
This course introduces the student to the history of organ procurement and transplantation, the role of the organ procurement coordinator, consent, privacy issues, diversity and multicultural issues related to death and other issues related with the profession.
Term Offered: Spring, Summer, Fall

HDSC 5020 Scholarly Proj Hum Donation Sc
[3 credit hours]

HDSC 5110 Fundamental Concepts and Clinical Practicum I
[3 credit hours]
This course provides students with clinical information, cases and experiences to compliment HDSC 521. Students also will observe organ procurement coordinators and will be assigned "on call" rotations.
Corequisites: HDSC 5010, HDSC 5210
Term Offered: Spring, Summer, Fall

HDSC 5120 Clinical Practicum II
[2 credit hours]
Enables the learner to develop proficiency in the practice of human donation science in a clinical setting under the supervision of a professional organ procurement coordinator.
Term Offered: Spring, Summer, Fall

HDSC 5130 Human Donation Sci Internship
[8 credit hours]
Supervised full-time clinical experience in organ procurement organizations to prepare students for clinical practice. Builds upon classroom and practicum coursework.
Term Offered: Spring, Summer, Fall

HDSC 5210 Scientific & Clinical Foundations for Human Organ & Tissue Donation & Transportation
[6 credit hours]
This course provides the foundation of the basic science and medical/surgical information required for the organ procurement coordinator. Topics include structure, normal and pathological function, pharmacology, brain death, and approaches to medical and surgical management.
Term Offered: Spring, Summer, Fall

HDSC 5310 Clinical Aspects Procurement
[4 credit hours]
Builds upon the foundations of the basic science and medical-surgical information required for the organ procurement coordinator.
Term Offered: Spring, Summer, Fall

HDSC 5410 Human Donation Science Seminar
[2 credit hours]
Selected topics that integrate learning and practice in human donation science.
Term Offered: Spring, Summer, Fall

Human Resource Managment (HURM)

HURM 6700 Human Resource Management
[3 credit hours]
A survey of the functions and current trends in human resources management. Special emphasis on research methods, tools and techniques for in-depth understanding of problems and challenges faced by for-profit and not-for-profit organizations.
Term Offered: Summer, Fall

HURM 6720 Advanced Negotiation and Conflict Management
[3 credit hours]
Course is designed to develop advanced skills in all phases of negotiation and conflict management strategies and techniques. The course is based on a series of simulated negotiations in a variety of contexts.
Term Offered: Spring, Summer, Fall

HURM 6730 Performance Management
[3 credit hours]
This course is designed to provide practical working knowledge of the processes of setting expectations, monitoring performance, coaching and developing employees, and assessing and rewarding good performance in rapidly changing organizations.
Term Offered: Spring, Fall

HURM 6750 Current Topics In Human Resource Management
[3 credit hours]
This course is designed to provide students with current viewpoints, challenges, practices and theories in human resource management. Conducted in a seminar format, the course will emphasize different aspects of HR management each time it is offered.
Prerequisites: HURM 6700 with a minimum grade of C
Term Offered: Spring, Summer, Fall

HURM 8750 Current Topics in Human Resource Management
[3 credit hours]
Course is designed to provide students with current viewpoints, challenges, practices, and theories in human resource management. Conducted in a seminar format, the course will emphasizes different aspects of HR management each time it is offered.
Prerequisites: HURM 6700 with a minimum grade of D- and HURM 8700 with a minimum grade of D-
Term Offered: Fall

Information Systems (INFS)

INFS 6050 Information Systems Fundamentals
[3 credit hours]
This will be a crash course for MBA students wanting to concentrate in Information Systems. The student is expected to develop the basic skills needed to create computer-based applications. In addition, the student will gain an understanding of the various contemporary topics surrounding Information Systems and business.
Term Offered: Summer, Fall

INFS 6150 Business Intelligence Management
[3 credit hours]
This course aims to give students a broad understanding of technical and business issues in data analytics. Students will gain proficiency with reporting, data visualization and prediction. Students will learn analytics techniques that is useful in areas such as marketing and forensics accounting.
Prerequisites: BUAD 2060 with a minimum grade of C or OSCM 5510 with a minimum grade of C

INFS 6450 Data Mining
[3 credit hours]
This course aims to give students a broad understanding of technical and business issues in data mining and data warehousing. Students will gain understanding of the techniques and issues surrounding data warehousing. In addition, students will learn advanced data mining techniques that is useful in various business functions.
Prerequisites: BUAD 2060 with a minimum grade of C or OSCM 5510 with a minimum grade of C
Term Offered: Spring, Fall

INFS 6560 Business Systems Analysis and Design
[3 credit hours]
Analysis, design and implementation of business information systems will be studied using Case tools and other appropriate software systems. Will also emphasize management of organizational change brought about by information technology projects.
Prerequisites: BUAD 6800 with a minimum grade of C
Term Offered: Spring, Summer, Fall

INFS 6610 Information Integration and Data Management
[3 credit hours]
This course is intended to provide basic understandings of database management systems for businesses. The course has two components: basic theories on relational data bases, and extensive skills in developing and manipulating relational database (Oracle, MS-SQL, and MS Access) objects and applications. The theory component will emphasize the relational database model, including database integrity, data modeling, SQL, and logical database design. The “Skills” component will focus on creating and maintaining various database objects, such as tables, relationship diagram, queries, reports, forms, and web connections.
Term Offered: Spring, Fall

INFS 6710 Management of Information Systems Security
[3 credit hours]
This course aims to give students a broad understanding of technical and business issues in information systems security, systems security models, analysis of process and technology in systems security and security policies leading to information assurance.
Term Offered: Spring, Fall

INFS 6780 ERP Systems Process Management
[3 credit hours]
This course will provide students an overview of the fundamental business processes and examination of the application of business enterprise software using SAP. Issues include software deployment that supports transaction processing in the business supply chain. Also, students will work on various hands-on exercises including process of entire business cycle with a fictitious company and implementation of simple application with NetWeaver development platform.

INFS 6790 ERP Systems Configuration and Integration
[3 credit hours]
This course will provide students an overview of the fundamental business processes and examination of how business processes interact with SAP ERP including the system configuration and implementation. Issues. Students will gain a deep appreciation for the role of enterprise systems in managing processes from multiple functional perspectives. Also, students will work on various hands-on exercises including configuration of a fictitious company and implementation of business rules using an enterprise system.

INFS 6810 Network Communications
[3 credit hours]
Applications of business data communication, basic electronic communications concepts, public networks, computer networks, the Internet, network management, regulatory environment.
Term Offered: Spring

INFS 6930 Contemporary Topics Seminar
[3 credit hours]
This seminar will focus on current topics in the fields of Information Systems and Operations Management.
Term Offered: Spring, Fall

INFS 8710 Management of Information Systems Security
[3 credit hours]
This course aims to give students a broad understanding of technical and business issues in information systems security, systems security models, analysis of process and technology in systems security and security policies leading to information assurance.
Term Offered: Spring, Fall

Interdisciplinary (INDI)

INDI 5050 Medical Science Practicum
[0-10 credit hours]
Practical applications of theory in basic and clinical medical sciences. Practicum experience will be under the guidance of a faculty preceptor. May be repeated for credit.
Term Offered: Summer, Fall

INDI 5150 Intro Anatomy and Physiology
[6 credit hours]
This course provides basic knowledge of anatomy and physiology.

INDI 5200 Cellular and Molecular Biology
[11 credit hours]
This course includes an introduction to cell structure, function and pathological changes, information about molecular structure of proteins, carbohydrates and lipids, basic human genetics.
Term Offered: Fall

INDI 5250 Human Physiology
[3 credit hours]

INDI 5350 Pathophysiology of Organ Systems
[2-10 credit hours]
MSBS in Medical Sciences (MSBS-MS) is a one-year program designed to train students in foundational medical sciences. The newly redesigned course emphasizes an organ-system based approach where clinical and graduate faculty train students in the pathophysiology of disease. This is a graduate level course that incorporates materials taught to medical students during their first and second years, and provides foundational information for the MD curriculum. Also, pathophysiology of disease is a significant portion of the USMLE exams and its inclusion in our new MSBS-MS curriculum has the potential to increase our student-scores in step 1 and step 2.

INDI 5450 Molecular Cell Biology
[7 credit hours]
This is a graduate level course that incorporates materials taught to first year medical students and provides foundational information for the MD curriculum. The major topics are molecular biology and genetics, biochemistry of metabolic pathways, and cellular organization. This is the first course in the MSBS in Medical Sciences (MSBS-MS) curriculum.

INDI 5550 Anatomy and Pathophysiology
[3 credit hours]
Introductory and foundational course designed to cover selected topics in human anatomy, embryology, physiology and pathophysiology.
Term Offered: Spring, Fall

INDI 5650 Immunology and Medical Microbiology
[4 credit hours]
This course introduces foundational concepts in immunology and medical microbiology. The course will educate the students about the microorganisms that are relevant to human health, and the immune system, which allows us to overcome infection as well as to reject transplantation of organs and tissue.

INDI 6000 Introduction to Biostatistical Methods
[3 credit hours]
An introduction to statistical reasoning with an overview of selected descriptive and inferential statistics commonly used in healthcare research. Computer analysis of data will be included.
Term Offered: Spring, Summer, Fall

INDI 6020 On Being a Scientist
[1 credit hour]
A series of one-hour lectures dealing with the ethics, regulations, and issues facing a modern, biomedical research scientist.
Term Offered: Spring, Summer

INDI 6730 Research Biomedical Science
[0-15 credit hours]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring, Summer, Fall

INDI 6860 Electron Microscopy
[4 credit hours]
A lecture/laboratory course in the standard theories and techniques employed in biological transmission and scanning electron microscopy.

INDI 6920 Student Seminar Series
[1 credit hour]
This course is designed to provide students with an opportunity to develop and/or strengthen oral presentation and communication skills in the form of short scientific oral communications. Students will present data and conclusions –whether preliminary or final- acquired during their scholarly project in medical sciences – which is required to fulfill the research requirements of the MSBS in Medical Sciences degree program. Through these seminar presentations students will have an opportunity to discuss various contemporary research topics in medical sciences in relation to their scholarly project.
Term Offered: Summer

INDI 6980 Scholarly Project for Medical Sciences
[0-12 credit hours]
Option to develop an in-depth scholarly project to fulfill the research requirements of the MSBS Degree Program. May be repeated for credit.

INDI 6990 Thesis Research
[1-15 credit hours]
Research in biomedical sciences or interdisciplinary investigation of significant problems at the master level, leading to the preparation of a scientific project for presentation as a thesis. May be repeated for credit.

INDI 8000 Introduction to Biostatistical Methods
[3 credit hours]
An introduction to statistical reasoning with an overview of selected descriptive and inferential statistics commonly used in healthcare research. Computer analysis of data will be included.
Term Offered: Spring, Summer, Fall

INDI 8020 On Being a Scientist
[1 credit hour]
A series of one-hour lectures dealing with the ethics, regulations, and issues facing a modern, biomedical research scientist.
Term Offered: Spring, Summer

INDI 8280 Intro To Global Medicine
[3 credit hours]
This course is intended for medical and graduate students as an introduction to medical and community development missions in developing nations.
Term Offered: Summer

INDI 8730 Research Biomedical Sciences
[0-15 credit hours]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit.
Term Offered: Summer

INDI 8790 Basic and Adv Light Microscopy
[4 credit hours]
A lecture/laboratory course in the standard theories and techniques in histology and light microscopy. The emphasis is on preparation of samples, including histocytochemistry, immunocytochemistry and special staining for photo microscopy. Brightfield, fluorescence and confocal microscopy.
Term Offered: Spring, Fall

INDI 8860 Electron Microscopy
[4 credit hours]
A lecture/laboratory course in the standard theories and techniques employed in biological transmission and scanning electron microscopy.

INDI 9990 Dissertation Research
[1-15 credit hours]
Disciplinary or interdisciplinary investigation of significant problems at the doctoral level under the guidance of a member of the Graduate Faculty, leading to the preparation of a scientific project for presentation as a dissertation. May be repeated for credit.

International Business (IBUS)

IBUS 6100 Study Abroad Program
[3 credit hours]
Program includes travel abroad, study and written report of an industry, company, or issues of interest, cultural immersion, and visits to manufacturing, service and government organizations.
Term Offered: Spring, Summer, Fall

IBUS 6990 Independent Study
[1-3 credit hours]
Independent study in international business. A proposal for the independent study must be approved by faculty member and department chair.
Term Offered: Spring, Summer, Fall

Law (Bar-Tested) (LAWG)

LAWG 6010 Business Associations
[4 credit hours]
Business Associations focuses on the legal entities commonly used to operate business enterprises, with an emphasis on closely held businesses. The course explores the major issues involved in formation and operation of agency relationships, corporations, and limited liability companies. These include creation of business entities; financing for the small business; sharing in earnings; the roles of corporate officers, directors, and shareholders; roles of LLC managers and members; doctrines of limited liability; fiduciary duties; and special statutory treatment of closely held corporations.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWG 6210 Criminal Procedure - Investigations
[3 credit hours]
A study of the constitutional and statutory limitations on the conduct of criminal investigations and related matters. Includes a discussion of the Fourth Amendment prohibition against unreasonable searches and seizures, the Fifth Amendment privilege against self-incrimination, and the Sixth Amendment right to counsel.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Fall

LAWG 6370 Family Law
[3 credit hours]
This course explores the interaction of law and the family. It surveys various topics including marriage, divorce and its financial consequences, child custody, non-marital families, parentage, adoption, and assisted reproductive technology.
Prerequisites: LAWM 5000 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWG 6610 Secured Transactions
[3 credit hours]
The creation, enforcement, perfection, and priority of security interests in personal property under Article Nine of the Uniform Commercial Code and the federal Bankruptcy Code.
Prerequisites: LAWD 6210 with a minimum grade of D- and LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWG 6710 Trusts and Estates
[3-4 credit hours]
The study of decedents' estates and trust law. Interstate succession, the law of wills, estate administration, formation and administration of trusts, and future interests are studied. Common law approaches are contrasted with Ohio and Uniform Probate Code practices.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of C

LAWG 9010 Business Associations
[4 credit hours]
Business Associations focuses on the legal entities commonly used to operate business enterprises, with an emphasis on closely held businesses. The course explores the major issues involved in formation and operation of agency relationships, corporations, and limited liability companies. These include creation of business entities; financing for the small business; sharing in earnings; the roles of corporate officers, directors, and shareholders; roles of LLC managers and members; doctrines of limited liability; fiduciary duties; and special statutory treatment of closely held corporations.
Term Offered: Spring, Summer, Fall

LAWG 9170 Conflict of Laws
[2-3 credit hours]
This course will study the problems encountered when a transaction or occurrence has a significant relationship to two or more states or countries. The jurisdiction of courts, the effect to be given to out-of-state judgments, and the rules of decision in multi-state cases are studied. Both traditional rules and theories and modern developments are analyzed.
Term Offered: Spring, Summer, Fall

LAWG 9210 Criminal Procedure - Investigations
[3 credit hours]
A study of the constitutional and statutory limitations on the conduct of criminal investigations and related matters. Includes a discussion of the Fourth Amendment prohibition against unreasonable searches and seizures, the Fifth Amendment privilege against self-incrimination, and the Sixth Amendment right to counsel.
Term Offered: Spring, Fall

LAWG 9370 Family Law
[3 credit hours]
This course explores the interaction of law and the family. It surveys various topics including marriage, divorce and its financial consequences, child custody, non-marital families, parentage, adoption, and assisted reproductive technology.
Term Offered: Spring, Summer, Fall

LAWG 9610 Secured Transactions
[3 credit hours]
The creation, enforcement, perfection, and priority of security interests in personal property under Article Nine of the Uniform Commercial Code and the federal Bankruptcy Code.
Prerequisites: LAWD 9210 with a minimum grade of D
Term Offered: Spring, Summer, Fall

LAWG 9710 Trusts and Estates
[3-4 credit hours]
The study of decedents' estates and trust law. Intestate succession, the law of wills, estate administration, formation and administration of trusts, and future interests are studied. Common law approaches are contrasted with Ohio and Uniform Probate Code practices.
Prerequisites: LAWD 9410 with a minimum grade of C
Term Offered: Spring, Fall

Law (Basic First-Yr Required) (LAWD)

LAWD 6020 Civil Procedure - Pleading and Practice
[3 credit hours]
Study of the rules controlling the management of civil litigation. State and federal systems are covered.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Fall

LAWD 6110 Constitutional Law - Structure
[3 credit hours]
Constitutional Law - Structure will cover structural issues focusing on the Supreme Court's interpretation of the nature and distribution of power within the federal government, the relationship between the federal government and the states in regulating commerce, and the meaning and scope of the Due Process Clause of the Fourteenth Amendment.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer

LAWD 6210 Contracts I
[3 credit hours]
A survey of the law of contracts including the creation, modification, and termination of contract rights obligations, the roles of reliance and restitution, capacity, conditions, third party rights and duties, and the effect of changed circumstances or mistake. Performance and breach of contractual obligations and remedies for breach are also examined in detail. The course includes a survey of the law relating to sales of goods under Article 2 of the Uniform Commercial Code.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Fall

LAWD 6220 Contracts II
[3 credit hours]
A continued survey of the law of contracts including the creation, modification, and termination of contract rights and obligations, the roles of reliance and restitution, capacity, conditions, third party rights and duties, and the effect of changed circumstances or mistake. Performance and breach of contractual obligations and remedies for breach are also examined in detail. The course includes a survey of the law relating to sales of goods under Article 2 of the Uniform Commercial Code.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer

LAWD 6300 Criminal Law
[4 credit hours]
Substantive criminal law, focusing on general principles of liability and defenses, the definitional elements of certain crimes, particularly homicide, and principles of accessorial liability.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring

LAWD 6410 Property - Fundamentals of Ownership
[3 credit hours]
An introduction to the law of personal property and comprehensive coverage of the law of real property as it relates to estates and interests in land, landlord-tenant relationships, real estate transactions, private agreements respecting the use of land, and public controls upon property use.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Fall

LAWD 6420 Property - Transactions and Land Use
[3 credit hours]
Continued study of the law of personal property and comprehensive coverage of the law of real property as it relates to estates and interests in land, landlord-tenant relationships, real estate transactions, private agreements respecting the use of land, and public controls upon property use.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWD 6510 Torts
[4 credit hours]
Torts explores civil claims for a variety of intentional harms and offenses to people and property, negligent harms, and theories of strict liability (including products liability). The course studies both traditional principles and modern concepts.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWD 6750 Lawyering Skills I
[2-3 credit hours]
A foundation course providing intensive instruction in three major areas: using research resources and techniques of research; developing skills of legal analysis; presenting legal analysis in predictive and persuasive formats, both written and oral. Instruction is through class meetings, small group meetings, and individual conferences.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Fall

LAWD 6760 Lawyering Skills II
[1-2 credit hours]
A continuation of Lawyering Skills I, this course provides intensive instruction in three major areas: using research resources and techniques of research; developing skills of legal analysis; presenting legal analysis in predictive and persuasive formats, both written and oral. Instruction is through class meetings, small group meetings, and individual conferences.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWD 9020 Civil Procedure - Pleading and Practice
[3 credit hours]
Study of the rules controlling the management of civil litigation. State and federal systems are covered.
Term Offered: Spring, Fall

LAWD 9110 Constitutional Law - Structure
[3 credit hours]
Constitutional Law - Structure will cover structural issues focusing on the Supreme Court's interpretation of the nature and distribution of power within the federal government, the relationship between the federal government and the states in regulating commerce, and the meaning and scope of the Due Process Clause of the Fourteenth Amendment.
Term Offered: Spring, Summer, Fall

LAWD 9210 Contracts I
[3 credit hours]
A survey of the law of contracts including the creation, modification, and termination of contract rights obligations, the roles of reliance and restitution, capacity, conditions, third party rights and duties, and the effect of changed circumstances or mistake. Performance and breach of contractual obligations and remedies for breach are also examined in detail. The course includes a survey of the law relating to sales of goods under Article 2 of the Uniform Commercial Code.
Term Offered: Spring, Fall

LAWD 9220 Contracts II
[3 credit hours]
A continued survey of the law of contracts including the creation, modification, and termination of contract rights and obligations, the roles of reliance and restitution, capacity, conditions, third party rights and duties, and the effect of changed circumstances or mistake. Performance and breach of contractual obligations and remedies for breach are also examined in detail. The course includes a survey of the law relating to sales of goods under Article 2 of the Uniform Commercial Code.
Term Offered: Spring, Summer, Fall

LAWD 9300 Criminal Law
[4 credit hours]
Substantive criminal law, focusing on general principles of liability and defenses, the definitional elements of certain crimes, particularly homicide, and principles of accessorial liability.
Term Offered: Spring

LAWD 9410 Property I
[3 credit hours]
An introduction to the law of personal property and comprehensive coverage of the law of real property as it relates to estates and interests in land, landlord-tenant relationships, real estate transactions, private agreements respecting the use of land, and public controls upon property use.
Term Offered: Fall

LAWD 9420 Property II
[3 credit hours]
Continued study of the law of personal property and comprehensive coverage of the law of real property as it relates to estates and interests in land, landlord-tenant relationships, real estate transactions, private agreements respecting the use of land, and public controls upon property use.
Term Offered: Spring, Fall

LAWD 9510 Torts
[4 credit hours]
Torts explores civil claims for a variety of intentional harms and offenses to people and property, negligent harms, and theories of strict liability (including products liability). The course studies both traditional principles and modern concepts.
Term Offered: Spring, Summer, Fall

LAWD 9750 Lawyering Skills I
[2-3 credit hours]
A foundation course providing intensive instruction in three major areas: using research resources and techniques of research; developing skills of legal analysis; presenting legal analysis in predictive and persuasive formats, both written and oral. Instruction is through class meetings, small group meetings, and individual conferences.
Term Offered: Spring, Fall

LAWD 9760 Lawyering Skills II
[1-2 credit hours]
A continuation of Lawyering Skills I, this course provides intensive instruction in three major areas: using research resources and techniques of research; developing skills of legal analysis; presenting legal analysis in predictive and persuasive formats, both written and oral. Instruction is through class meetings, small group meetings, and individual conferences.
Term Offered: Spring, Summer

Law (Clinics and Skills) (LAWN)

LAWN 6000 Trial Practice
[3 credit hours]
Simulated exercises and trials, including such matters as pretrial motions, jury selection, opening statement, presentation of evidence, cross-examination, witness impeachment, closing argument, and jury instructions. Emphasis is given to developing and proving a theory of the case.
Prerequisites: LAWA 6310 with a minimum grade of C

LAWN 6020 Advanced Legal Research
[2-3 credit hours]
An in-depth view of legal bibliography in both print and electronic formats. Detailed attention given to encyclopedias, treatises, and various general and topical indexes, digests, and citators as well as web based compilations of legal materials.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWN 6030 Law Practice
[1-3 credit hours]
An introduction to management of a law practice. This course will develop concepts related to four areas: Business Management, Practice Management, Client Management and Life Management. In the area of Business Management, students will be exposed to business start-up considerations, including choice of entity, financing, bookkeeping and trust accounting. In the area of Practice Management, the students will cover administrative and substantive systems, including conflicts of interest, docket management, form files and employee management. In Client Management, the students will be exposed to issues related to client acceptance, declination, disengagement, client satisfaction and malpractice to name a few.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWN 6050 Negotiation and Settlement
[2-3 credit hours]
This course focuses on developing an analytical framework for preparing, conducting and evaluating negotiations. A variety of negotiation strategies and tactics are explored including cooperative, problem-solving and competitive, positional approaches. Students conduct approximately ten negotiations that explore a variety of deal-making and dispute resolution fact situations.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWN 6100 Negotiation: Theory and Strategy
[3 credit hours]
This practical, skills course develops a series of conceptual structures for understanding negotiation as a coherent process and for understanding the strategic dynamics of all negotiating situations. The goal of the course is to encourage students to become skilled, versatile, and effective negotiators by applying the relevant structures, theories, and strategies to legal negotiations that will be scheduled each week of the course.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWN 6110 Advanced Trial Practice
[2 credit hours]
An examination of the development and adjudication of complex civil and criminal cases through demonstration and performance exercises. Students will participate in developing juror profiles and the creation of jury instructions; the direct and cross examination of expert witnesses; the introduction, handling and admissibility of exhibit evidence; and the recognition of constitutional issues arising during the trial.
Prerequisites: LAWA 6310 with a minimum grade of C and (LAWN 6000 with a minimum grade of C or LAWL 6180 with a minimum grade of S)

LAWN 6130 Criminal Law Simulation
[2-3 credit hours]
In this simulation course, students will prepare a case for trial/plea and end the semester with a sentencing hearing. The course will feature written assignments and in-class exercises and will cover hearings on arraignment, detention, suppression, plea, and sentencing. Students will work together and hone their skills as members of prosecution and defense teams.
Prerequisites: LAWM 5000 with a minimum grade of C

LAWN 6190 Interviewing and Counseling
[2-3 credit hours]
Most lawyers in both litigation and transactional practice spend substantial amounts of their time interviewing and counseling clients. The goals of this course are to develop understanding of theories and techniques of client interviewing and counseling and to assist students to develop skills in performance of interviewing and counseling. Readings and class discussion impart knowledge of theory and techniques. Mere understanding, however, is insufficient to develop performance competence. To develop competence in performance of these skills, students participate in simulations based on case files that will be distributed. Simulations will be recorded on videotape and will be evaluated by the performer, classmates and the instructor.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWN 6310 Criminal Law Practice Program
[4-6 credit hours]
The Criminal Law Practice Program trains law students in basic prosecutorial skills and values. Students serve externships in local prosecutor offices trying cases, plea-bargaining, and interviewing witnesses. The clinic may be taken for either six or four credit hours.
Prerequisites: LAWA 6310 with a minimum grade of C

LAWN 6330 Advanced Criminal Law Practice Program
[3-4 credit hours]
The Advanced Criminal Law Practice Program trains students in advanced skills of prosecution. Students undertake more challenging tasks than those typically undertaken in the basic clinic. For example, students may conduct jury trials, make appellate arguments, or draft clinical training manuals.
Prerequisites: LAWN 6310 with a minimum grade of C

LAWN 6410 Dispute Resolution Clinic
[2-4 credit hours]
In the Dispute Resolution Clinic, second and third year students have the unique opportunity to learn mediation skills and apply those skills mediating in the Lucas County Juvenile Court and Toledo Municipal Court. This fieldwork experience provides hands-on training in the area of alternative dispute resolution. Skills such as listening, communication, and negotiation are stressed in both the fieldwork and weekly classroom component. Students are taught theoretical technique and are exposed to a variety of topics and speakers in the Alternative Dispute Resolution field. This clinical program is designed to teach practical skills and give the students an opportunity to interact in the legal community in a new and emerging area of law.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWN 6420 Advanced Dispute Resolution Clinic
[2-4 credit hours]
The Advanced Dispute Resolution Clinic emphasizes development of skills beyond those achieved in the basic clinic. The course provides students with the opportunity to become involved in mediations in a number of courts throughout Lucas County and Northwest Ohio.
Prerequisites: LAWN 6410 with a minimum grade of C

LAWN 6610 Public Service Externship
[1-6 credit hours]
The Public Service Externship Clinic is a field placement program in which students are placed in structured legal settings with public service attorneys and programs. There is a required classroom component in which issues relating to learning from experience are explored. The program is available year round with out-of-town placements available in the summer term.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWN 6910 Civil Advocacy Clinic
[2-6 credit hours]
The Civil Advocacy Clinic focuses on development of skills such as interviewing, counseling, negotiation, problem-solving, fact investigation, strategy formation law, landlord and tenant, consumer, and civil rights cases. In addition, students may work on law reform and policy projects. Students in the clinic are the primary contact for clients, and are given responsibility for work on all aspects of the case under the close supervision of clinic faculty. Classroom meetings focus on practical, substantive, procedural, and ethical issues, especially as they relate to the clients and cases handled by the clinic. It is recommended, but not required, that students complete at least 59 credit hours and apply for certification as legal interns under Rule II of the Ohio Supreme Court Rules for the Governance of the Bar.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWN 6930 Advanced Civil Advocacy Clinic
[2-4 credit hours]
The Advanced Civil Advocacy Clinic emphasizes development of skills beyond those achieved in the basic clinic. The program is tailored to meet the needs and interests of individual students. Typically, students in the Advanced Civil Advocacy Clinic are assigned more complex legal matters, mentor students in the basic Civil Advocacy Clinic, and/or work on policy or legislative projects.
Prerequisites: LAWN 6910 with a minimum grade of C

LAWN 6940 Children's Rights Clinic
[3-6 credit hours]
The Children's Rights Clinic deals with a variety of legal and policy issues affecting survivors of domestic violence, including representation to obtain protection orders, dissolution of marriage, and attendant issues of custody and support. The Clinic also handles juvenile law matters including parentage, parental rights, and adoptions. Admission is by the permission of the instructor. It is recommended, but not required, that students complete at least 59 credit hours and apply for certification as legal interns under Rule II of the Ohio Supreme Court Rules for the Governance of the Bar.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWN 6950 Advanced Children's Rights Clinic
[2-4 credit hours]
In the Advanced Children's Rights Clinic students will act more independently as lead counsel for clients and may assume some supervisory responsibilities on cases handled by students in the basic Children's Rights Clinic. In addition, depending on student interest, students may conduct research on issues relating to domestic violence or juvenile law.
Prerequisites: LAWN 6940 with a minimum grade of C

LAWN 9000 Trial Practice
[3 credit hours]
Simulated exercises and trials, including such matters as pretrial motions, jury selection, opening statement, presentation of evidence, cross-examination, witness impeachment, closing argument, and jury instructions. Emphasis is given to developing and proving a theory of the case.
Prerequisites: LAWA 9310 with a minimum grade of C
Term Offered: Spring, Fall

LAWN 9020 Advanced Legal Research
[2-3 credit hours]
An in-depth view of legal bibliography in both print and electronic formats. Detailed attention given to encyclopedias, treatises, and various general and topical indexes, digests, and citators, as well as web-based compilations of legal materials.
Term Offered: Spring, Summer, Fall

LAWN 9030 Law Practice
[1-3 credit hours]
An introduction to management of a law practice. This course will develop concepts related to four areas: Business Management, Practice Management, Client Management and Life Management. In the area of Business Management, students will be exposed to business start-up considerations, including choice of entity, financing, bookkeeping and trust accounting. In the area of Practice Management, the students will cover administrative and substantive systems, including conflicts of interest, docket management, form files and employee management. In Client Management, the students will be exposed to issues related to client acceptance, declination, disengagement, client satisfaction and malpractice to name a few.

LAWN 9050 Negotiation and Settlement
[2-3 credit hours]
This course focuses on developing an analytical framework for preparing, conducting and evaluating negotiations. A variety of negotiation strategies and tactics are explored including cooperative, problem-solving and competitive, positional approaches. Students conduct approximately ten negotiations that explore a variety of deal-making and dispute resolution fact situations.

LAWN 9100 Negotiation: Theory and Strategy
[3 credit hours]
This practical, skills course develops a series of conceptual structures for understanding negotiation as a coherent process and for understanding the strategic dynamics of all negotiating situations. The goal of the course is to encourage students to become skilled, versatile, and effective negotiators by applying the relevant structures, theories, and strategies to legal negotiations that will be scheduled each week of the course.
Term Offered: Spring, Summer, Fall

LAWN 9110 Advanced Trial Practice
[2 credit hours]
An examination of the development and adjudication of complex civil and criminal cases through demonstration and performance exercises. Students will participate in developing juror profiles and the creation of jury instructions; the direct and cross examination of expert witnesses; the introduction, handling and admissibility of exhibit evidence; and the recognition of constitutional issues arising during the trial.
Prerequisites: LAWA 9310 with a minimum grade of C and (LAWN 9000 with a minimum grade of C or LAWL 9180 with a minimum grade of S)
Term Offered: Spring

LAWN 9130 Criminal Law Simulation
[2-3 credit hours]
In this simulation course, students will prepare a case for trial/plea and end the semester with a sentencing hearing. The course will feature written assignments and in-class exercises and will cover hearings on arraignment, detention, suppression, plea, and sentencing. Students will work together and hone their skills as members of prosecution and defense teams.

LAWN 9190 Interviewing and Counseling
[2-3 credit hours]
Most lawyers in both litigation and transactional practice spend substantial amounts of their time interviewing and counseling clients. The goals of this course are to develop understanding of theories and techniques of client interviewing and counseling and to assist students to develop skills in performance of interviewing and counseling. Readings and class discussion impart knowledge of theory and techniques. Mere understanding, however, is insufficient to develop performance competence. To develop competence in performance of these skills, students participate in simulations based on case files that will be distributed. Simulations will be recorded on videotape and will be evaluated by the performer, classmates and the instructor.

LAWN 9310 Criminal Law Practice Program
[4-6 credit hours]
The Criminal Law Practice Program trains law students in basic prosecutorial skills and values. Students serve externships in local prosecutor offices trying cases, plea-bargaining, and interviewing witnesses. The clinic may be taken for either six or four credit hours.
Prerequisites: LAWA 9310 with a minimum grade of C
Term Offered: Spring, Fall

LAWN 9330 Advanced Criminal Law Practice Program
[3-4 credit hours]
The Advanced Criminal Law Practice Program trains students in advanced skills of prosecution. Students undertake more challenging tasks than those typically undertaken in the basic clinic. For example, students may conduct jury trials, make appellate arguments, or draft clinical training manuals.
Prerequisites: LAWN 9310 with a minimum grade of C
Term Offered: Spring, Fall

LAWN 9410 Dispute Resolution Clinic
[2-4 credit hours]
In the Dispute Resolution Clinic, second and third year students have the unique opportunity to learn mediation skills and apply those skills mediating in the Lucas County Juvenile Court and Toledo Municipal Court. This fieldwork experience provides hands-on training in the area of alternative dispute resolution. Skills such as listening, communication, and negotiation are stressed in both the fieldwork and weekly classroom component. Students are taught theoretical technique and are exposed to a variety of topics and speakers in the Alternative Dispute Resolution field. This clinical program is designed to teach practical skills and give the students an opportunity to interact in the legal community in a new and emerging area of law.
Term Offered: Spring, Fall

LAWN 9420 Advanced Dispute Resolution Clinic
[2-4 credit hours]
The Advanced Dispute Resolution Clinic emphasizes development of skills beyond those achieved in the basic clinic. The course provides students with the opportunity to become involved in mediations in a number of courts throughout Lucas County and Northwest Ohio.
Prerequisites: LAWN 9410 with a minimum grade of C
Term Offered: Spring, Fall

LAWN 9510 Tax Controversy Clinic
[4 credit hours]
In order to give law students valuable experience in handling actual tax cases, the Tax Controversy Clinic will offer free representation to taxpayers who are involved with IRS audits, appeals, and collection matters. In certain cases the Tax Clinic will represent taxpayers before the United States Tax Court. The Tax Clinic will negotiate and resolve contested matter with the IRS.
Term Offered: Spring, Fall

LAWN 9520 Advanced Tax Controversy Clinic
[2 credit hours]
In order to give law students valuable experience in handling actual tax cases, the Tax Controversy Clinic will offer free representation to taxpayers who are involved with IRS audits, appeals, and collection matters. In certain cases the Tax Clinic will represent taxpayers before the United States Tax Court. The Tax Clinic will negotiate and resolve contested matter with the IRS.
Prerequisites: LAWN 9510 with a minimum grade of C
Term Offered: Spring, Summer, Fall

LAWN 9610 Public Service Externship
[1-6 credit hours]
The Public Service Externship is a field placement program in which students are placed in structured legal settings with public service attorneys and programs. There is a required classroom component in which issues relating to learning from experience are explored. The program is available year round with out-of-town placements available in the summer term.
Term Offered: Spring, Summer, Fall

LAWN 9710 Immigrant Justice Clinic
[4 credit hours]
The Immigrant Justice Clinic helps prepare students for a career in immigration law, or to gain insight about how U.S. legal systems and policy decisions impact immigrants, families, and communities. The clinic introduces substantive immigration law and the theory and practice of core lawyering skills, including interviewing; counseling; listening; investigating facts; researching and analyzing relevant law; creative problem-solving; critical lawyering (lawyering conscious of power, bias, and justice issues); administrative agency and courtroom practicing; and legal writing, including affidavits and advocacy-focused briefs. Under the supervision of clinical faculty, students represent local community members with critical legal needs working through the U.S. immigration system, including people seeking family reunification and safety from domestic violence, persecution, torture, and human trafficking. Students also conduct community education on a variety of immigration law topics. Casework is complemented by a seminar that meets twice per week.
Prerequisites: LAWI 9440 (may be taken concurrently) with a minimum grade of D
Term Offered: Spring, Summer, Fall

LAWN 9720 Advanced Immigrant Justice Clinic
[2 credit hours]
The Immigrant Justice Clinic helps prepare students for a career in immigration law, or to gain insight about how U.S. legal systems and policy decisions impact immigrants, families, and communities. The clinic introduces substantive immigration law and the theory and practice of core lawyering skills, including interviewing; counseling; listening; investigating facts; researching and analyzing relevant law; creative problem-solving; critical lawyering (lawyering conscious of power, bias, and justice issues); administrative agency and courtroom practicing; and legal writing, including affidavits and advocacy-focused briefs. Under the supervision of clinical faculty, students represent local community members with critical legal needs working through the U.S. immigration system, including people seeking family reunification and safety from domestic violence, persecution, torture, and human trafficking. Students also conduct community education on a variety of immigration law topics. Casework is complemented by a seminar that meets twice per week.
Prerequisites: LAWN 9710 with a minimum grade of C
Term Offered: Spring, Summer, Fall

LAWN 9910 Civil Advocacy Clinic
[4 credit hours]
The Civil Advocacy Clinic focuses on development of skills such as interviewing, counseling, negotiation, problem-solving, fact investigation, strategy formation law, landlord and tenant, consumer, and civil rights cases. In addition, students may work on law reform and policy projects. Students in the clinic are the primary contact for clients, and are given responsibility for work on all aspects of the case under the close supervision of clinic faculty. Classroom meetings focus on practical, substantive, procedural, and ethical issues, especially as they relate to the clients and cases handled by the clinic. It is recommended, but not required, that students complete at least 59 credit hours and apply for certification as legal interns under Rule II of the Ohio Supreme Court Rules for the Governance of the Bar.
Term Offered: Spring, Fall

LAWN 9930 Advanced Civil Advocacy Clinic
[2-4 credit hours]
The Advanced Civil Advocacy Clinic emphasizes development of skills beyond those achieved in the basic clinic. The program is tailored to meet the needs and interests of individual students. Typically, students in the Advanced Civil Advocacy Clinic are assigned more complex legal matters, mentor students in the basic Civil Advocacy Clinic, and/or work on policy or legislative projects.
Prerequisites: LAWN 9910 with a minimum grade of C
Term Offered: Spring, Fall

LAWN 9940 Children's Rights Clinic
[3-6 credit hours]
The Children's Rights Clinic deals with a variety of legal and policy issues affecting survivors of domestic violence, including representation to obtain protection orders, dissolution of marriage, and attendant issues of custody and support. The Clinic also handles juvenile law matters including parentage, parental rights, and adoptions. Admission is by the permission of the instructor. It is recommended, but not required, that students complete at least 59 credit hours and apply for certification as legal interns under Rule II of the Ohio Supreme Court Rules for the Governance of the Bar.
Term Offered: Spring, Fall

LAWN 9950 Advanced Children's Rights Clinic
[2-4 credit hours]
In the Advanced Children's Rights Clinic students will act more independently as lead counsel for clients and may assume some supervisory responsibilities on cases handled by students in the basic Children's Rights Clinic. In addition, depending on student interest, students may conduct research on issues relating to domestic violence or juvenile law.
Prerequisites: LAWN 9940 with a minimum grade of C
Term Offered: Spring, Fall

Law (Electives) (LAWI)

LAWI 6000 International Comparative Law
[2-3 credit hours]
This course introduces students to the major legal systems of the world. The first third of the course provides an overview of the major families of law encountered in various nations of the world today: common law (as exemplified by California and England), civil law (France and Germany), religious law (Egypt), and the extra-legal approach seen in various Asian countries (China). The rest of the course examines how each of these systems handles the same types of common legal situation: inheritance and succession, criminal behavior and contracts.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6010 Accounting and Financial Statements
[1-3 credit hours]
An introduction for students without prior accounting experience to the terms and concepts necessary to an understanding of the financial affairs of a client and to the variety of legal contexts in which the lawyer is likely to encounter accounting problems. Students will learn to perform basic financial analysis.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6020 E-Commerce
[1-3 credit hours]
This course will examine critical information technologies that provide a basis for electronic commerce. Topics include problems surrounding electronic commerce such as security, privacy, content selection and rating, intellectual property rights, authentication, encryption, acceptable use policies, UETA, UCITA and E-Sign.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6030 Administrative Law
[3 credit hours]
The law and operation of administrative agencies, including agency adjudication, rulemaking, and other forms of policy implementation. The course covers agencies' place in the constitutional structure, legislative and executive controls on agency action, and judicial review of agency fact-finding, statutory interpretation, and exercise of discretion. The course examines state agencies as well as federal agencies and the federal Administrative Procedure Act.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWI 6060 Sales and Leases of Goods
[2-3 credit hours]
A detailed study of sales of goods under Article 2 of the Uniform Commercial Code and a survey of both Article 2A of the Uniform Commercial Code (leases of goods) and the U.N. Convention on Contracts for the International Sale of Goods. Topics include contract formation and interpretation, warranties, express and implied terms, risk of loss, performance obligations and breach, and remedies for breach. Consideration may also be given to other state and federal laws affecting sales and leases of goods.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6070 Antitrust
[2-3 credit hours]
This course will cover the role of competition in a modern market economy, federal antitrust law, regulation and policies. Topics covered include horizontal restraints (price fixing, conspiracy, data dissemination, concerted refusals to deal, etc.); monopolization, attempts to monopolize, and oligopoly; problems concerning the relationship of antitrust to patent law; vertical restraints (restricted distribution, typing arrangements, exclusive dealing etc.); mergers (horizontal, vertical and conglomerate); selected Robinson-Patman Act problems, remedies and enforcement.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6080 Gender and the Law
[2-3 credit hours]
This course covers issues of gender and the law with a primary focus on how the law addresses sex discrimination. Students will discuss constitutional and statutory protections against sex discrimination from a doctrinal and theoretical perspective. Subjects covered in this class include employment discrimination, family law, public benefits, domestic violence and sexual orientation and the law.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6090 Disability Law
[2-3 credit hours]
This course examines the growing area of disability law. Topics to be covered include discrimination based on disability in employment and public accommodations, as well as the requirement for educational institutions to provide special education services to disabled students. Relevant federal statutes will be examined, including the Americans with Disabilities Act (with special emphasis on the ADA Amendments Act of 2009), Section 504 of the Rehabilitation Act, and the Individuals with Disabilities in Education Act.
Term Offered: Spring, Fall

LAWI 6100 International Law
[3 credit hours]
This course focuses on the legal processes of the international community. The creation of law among nation states, the law-making activities of international organizations, the enforcement (and non-enforcement) of international law in both national and international forums, the limits of national jurisdiction, the responsibility of states for the injuries to the persons or property of aliens, and the rules governing international agreements are surveyed. Particular attention is given to the law of treaties and the role of lawyers in foreign policy decision making.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWI 6110 Commercial Paper
[3 credit hours]
A study of payment systems. Initial emphasis is upon commercial paper (Article 3 of the Uniform Commercial Code) and bank deposits and collections (Article 4 of the Uniform Commercial Code), followed by credit cards (Truth in Lending, Consumer Credit Protection, and Fair Credit Billing Acts), commercial funds transfer (Article 4A of the Uniform Commercial Code), and consumer electronic funds transfer (Electronic Funds Transfers Act).
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Summer, Fall

LAWI 6130 Business Enterprise Tax
[2-3 credit hours]
An examination of the federal income tax treatment of business enterprises (including corporations, partnerships and limited liability companies) and their owners. The course considers the tax consequences of entity-owner transactions (formation and property contributions, distributions, redemptions and liquidations) as well as entity-level transactions (business operations, mergers, acquisitions and other business combinations).
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6200 Jurisprudence
[2-3 credit hours]
Jurisprudence is the philosophy of law. The two primary goals of this class are 1) to give students a basic background and understanding of important legal thinkers and theory and 2) to stimulate critical thinking through assigned readings and rollicking in-class discussions about concepts of law from Plato to present day. We will philosophically analyze concepts of precedence, interpretation, rights, civil disobedience, semantics, and virtues such as justice, desert and compassion.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6210 Copyright Law
[2-3 credit hours]
A substantive examination of the Copyright Act. This course will cover the fundamentals of copyright law and practice and the challenges to the existing copyright regime by new technologies.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWI 6220 Civil Rights Litigation Simulation
[2-3 credit hours]
This course will explore how to litigate constitutional claims, and how to enforce individual constitutional rights, including 4th, 8th, and 14th Amendment claims. The course will cover the relevant case law for a doctrinal overview, as well as the historical and factual backgrounds to the landmark cases in constitutional litigation. The course will also involve simulated law practice problems and other exercises to provide a hands-on approach to the problems and issues that arise in litigating constitutional claims.
Prerequisites: LAWM 5000 with a minimum grade of C
Term Offered: Spring, Summer, Fall

LAWI 6260 Race and American Law
[2-3 credit hours]
This course addresses the racial and legal history of the major racial groups in the U.S., including African Americans, Native Americans, Asian Americans, Latinos, and Whites. In addition to these histories, the course includes the following topics: competing definitions of race and racism; race, voting, and participation in democracy; developing notions of equality; segregation and education; and responses to racism, including resistance, coalitions, and healing.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWI 6270 Creditor and Debtor Law
[2-3 credit hours]
Explores creditors' rights under state law including judgment liens, execution liens, fraudulent conveyances, set off, assignments to benefit creditors, and statutory liens. Debtor defenses under state and federal law including constitutional protections, exemptions, and counterclaims are evaluated. Following this overview of general creditor execution, the majority of the course is devoted to resolution of claims in federal bankruptcy law.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6280 Criminal Procedure-Adjudications
[2-3 credit hours]
A study of the criminal processes from arrest through sentencing and appeal. Topics covered include bail, preliminary hearing, grand jury, plea bargaining and guilty pleas, discovery, fair trial, free press, jury trial, sentencing, and double jeopardy.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6300 Employment Discrimination
[3 credit hours]
This course focuses on the main federal statutes prohibiting employment discrimination and the policies underlying these laws, with the majority of time spent on Title VII of the Civil Rights Act of 1964, the Age Discrimination in Employment Act, and the Americans with Disabilities Act. Additional topics and subtopics include sexual harassment, discrimination based on sexual orientation, defenses, and reasonable accommodation of religion.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWI 6310 Employment Law
[2-3 credit hours]
This course focuses on the major state and federal employment laws affecting individual employees, excluding laws on unions and employment discrimination. Coverage includes the legal regulation of the hiring and firing process, testing and privacy issues, wage and hour laws, occupational health and safety, workers' compensation, unemployment insurance, covenants not to compete, and related topics.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWI 6330 Environmental Law
[2-3 credit hours]
This course provides an introduction to U.S. environmental law by examining major federal statutes and the policy goals underlying them. Key statutes explored include the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act (RCRA), and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Through analyzing and comparing different environmental statutes, students develop an understanding not only of the current environmental regulatory framework, but also of alternative approaches that may be employed to prevent pollution, clean up contamination, and protect the environment.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6350 Estate Planning
[2-3 credit hours]
This course focuses on the practical and tax aspects of estate planning. Emphasis is placed on the application of estate planning and wealth preservation techniques to commonly encountered estate planning problems.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWI 6360 Estate and Gift Tax
[2-3 credit hours]
A study of the federal estate and gift tax structure and its impact on the gratuitous transfer of property. Income taxation of trusts and estates and the generation skipping transfer tax are also discussed.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6380 Federal Courts and Federal Rights
[3 credit hours]
An intensive examination of the jurisdiction of federal courts, the role of the federal courts within the federal government, and within our federalist system. Topics surveyed include the law applied by federal courts in civil actions, the original and removal jurisdiction of federal courts, the relationship of the federal courts to state courts, congressional power over federal courts, the enforceability of federal law against states, and states' sovereign immunity.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6390 Natural Resources Law
[2-3 credit hours]
This course provides an introduction to natural resources law and policy affecting both public lands and private property. Conflicts over natural resources, including their protection and use, are among the most contentious legal and policy issues of our time. Students explore the reasons why, the roles governmental authorities play in the management of natural resources, and the laws and policies pertaining to wildlife, preservation, conservation, protected lands, forestry, mining, oil and gas, water rights, and other natural resources. Key federal statutes such as the National Environmental Policy Act and the Endangered Species Act are reviewed as well as cases, regulations, and commentary.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6400 American Legal History
[2-3 credit hours]
This seminar/course (students may elect either to write a paper or to take an examination) follows the profession's development from the American Revolution through the 1920's and the emergence of university-based professional education, the advent of new client constituencies including corporations, labor organizations, and anti-slavery and other social action groups, the development of standards of professional ethnic and racial minorities. The teaching approach emphasizes comparisons with current practice, critical use of original source materials and development of research and writing skills.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6440 Immigration Law
[2-3 credit hours]
The course is designed to present a survey of immigration and nationality law. It will cover issues of citizenship as well as admissions to the United States. The course will address issues of removal and deportation, as well as relief from removal.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6450 International Intellectual Property
[2-3 credit hours]
This course reviews: the main international intellectual property instruments (such as TRIPS, Paris Convention, Patent Cooperation Treat, European Patent Convention; Madrid Agreement, Berne and Rome conventions, WIPO treaties), and European main legislative texts (mainly regulations and directives) and main case law on patent, trademark and copyright. We also review the principal differences between the common law based system of copyright and the civil law system based on "droit d'auteur" (author's rights), with a special focus on electronic and Internet issues.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWI 6460 Insurance Law
[2-3 credit hours]
A study of property, liability and life insurance, and the insurer-insured relationship from a legal vantage point. Numerous concepts are examined during the course, including insurable interest, concealment and misrepresentation, the duty of good faith and fair dealing, scope of coverage, policy interpretation, change of beneficiary, duty to defend, bad faith refusal to settle, measures of recovery, multiple interests coverage, subrogation and other insurance clauses. Several insurance policies are examined in detail.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of C
Term Offered: Summer

LAWI 6470 Intellectual Property and Licensing
[2-3 credit hours]
This course focuses on the commercialization of intellectual property through the use of assignments and licenses. The course will cover intellectual property assignments and licenses, including express and implied licenses, the scope of licenses, bankruptcy issues, anti-trust issues and international licensing. The course will also cover intellectual property audits and patent, trade secret, copyright and trademark law to the extent an understanding of the rights and obligations inherent in such intellectual property classifications are necessary to effectively assign or license intellectual property. Students will analyze several licenses.
Prerequisites: (LAWI 6210 with a minimum grade of D or LAWI 6710 with a minimum grade of D or LAWI 6720 with a minimum grade of D or LAWI 6900 with a minimum grade of D)

LAWI 6480 International Business Transactions
[2-3 credit hours]
This course introduces students to the issues, problems, and legal norms applicable to International Business Transactions. The course will examine various problems that occur in international business as a means of discerning pitfalls for the unwary, as well as the matters that must be considered to protect one's client. The course will begin with an examination of the issues arising in a basic international sale and will progress through increasingly complex types of business interaction, including distributorships, franchising, licensing, joint ventures, and incorporating abroad. Through the course, there will be an emphasis on the U.S., foreign, and international laws and standards that may affect the transaction. The course will emphasize contract negotiation and drafting skills.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring

LAWI 6490 Juvenile Law
[2-3 credit hours]
An examination of the relationship between children, their parents, siblings, and the state in the lives of delinquent, unruly, dependent, neglected, and abused children. The role of the court, judiciary, attorneys, police, and social services historically, and in modern practice, will be examined as to the impact on families and individuals brought before the juvenile court. Special emphasis will be given to the theory of the juvenile justice system; the various court alternatives to adjudication; dispositional considerations and the attorney's role in representing the child, parents, or serving as a guardian ad litem.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6500 Federal Income Tax
[3-4 credit hours]
After a brief consideration of the federal income taxation system, this course examines the conceptual problems in defining income. A detailed treatment of the more significant personal and business deductions, exemptions, and credits follows. Statutory methodology and policy considerations (including the tax expenditure concept) are developed integrally with substantive topics. In addition, the course considers the tax treatment of gains and losses from the disposition of property, including the capital gains preference and deferral of taxation. Tax shelters and attempts by Congress and the Internal Revenue Service to limit their utilization may be explored as well.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWI 6510 Labor Law
[3 credit hours]
This course focuses on the law governing and policy issues surrounding the major facets of union-management relations in the private sector under the National Labor Relations Act (NLRA). These include union organizing, collective bargaining, contract enforcement, picketing, and the economic weapons of both sides, including strikes. The course also covers the procedural mechanisms by which rights under the NLRA are enforced and remedies for NLRA violations.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6520 Health Care Finance
[2-3 credit hours]
This course will cover the different problems presented by government regulation versus the private market model focusing on managed care (risk allocation, standard of care, consumer information), insurance (basic models of insurance and underwriting), health care licensing, and related ERISA issues as they affect the delivery of health care services.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of C

LAWI 6530 Consumer Law
[2-3 credit hours]
This course will study the practical application of Consumer Law including student loan law, credit card and debt collection law, Fair Credit Reporting Act, Lemon Law, Predatory Lending, etc.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6550 Health Care Fraud and Abuse
[2-3 credit hours]
The high cost of health care in the United States is exacerbated by rampant fraud and abuse on state and federal health care systems. This course presents an overview of legal and policy issues related to health care fraud and practical issues related to the prosecution and defense of heath care fraud-related suits. Pre- and post-litigation issues, such as corporate compliance programs, administrative investigations, and corporate integrity agreements, will also be explored. Course materials will cover major health care fraud and abuse statutes, including statutes addressing false claims, kickbacks, and self-referrals, as well as the regulatory regimes and administrative rulings that govern this area of the law. Students will be evaluated on one or more written assignments and exercises.
Prerequisites: LAWM 5000 with a minimum grade of C

LAWI 6560 Real Estate Transactions
[2-3 credit hours]
The course will address the purchase and sale, financing and leasing of real property. Students will draft various documents common in real estate transactions. Assignments will be reviewed, critiqued and revised in order to enhance drafting skills.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6570 Health Care Provider Liability
[2-3 credit hours]
This advanced torts course covers quality control in health care, medical malpractice, informed consent, medical confidentiality and institutional liability for medical injury. It includes causes of action against individual and institutional health care providers as well as third party payors, including insurers and managed care organizations. Tort reform issues are also addressed.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of C

LAWI 6630 Health Law
[2-3 credit hours]
This course provides an overview of the legal issues that arise in the health care field. Topics surveyed will include individual and institutional liability, public and private regulation, accreditation and licensure, hospital/medical staff relationships, and the challenge of achieving cost efficiencies, while also maintaining high quality care and improved access to care. Students will learn to identify key legal issues affecting the operation of a health care entity.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Fall

LAWI 6680 State and Local Government Law and Taxation
[2-3 credit hours]
An overview of the law relating to the administration of municipalities and their dealings with other local governmental units. Topics include the powers and problems of urban governmental units, federalism, corporate powers and police powers. Coverage includes the basic law and rules relating to the financing of local government and the various sources of tax revenue for local governments.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6700 Patent Practice and Procedure
[2-3 credit hours]
A hands-on course focusing on both regulatory requirements and attorney skills relating to representation of inventors before the Patent and Trademark Office. The course will follow a patent attorney's relationship with an inventor and the written PTO responses, appeals, and finally, patent grant.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6710 Patent Law
[2-3 credit hours]
A survey of the legal protection of inventions. This course covers the requirements for obtaining and enforcing a patent and the rights of a patentee with respect to licensing, assignment, and patent misuse.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Fall

LAWI 6720 Intellectual Property Survey
[2-3 credit hours]
A preparatory course covering Copyright, Patent, Trademark and Trade Secret Law. A broad coverage of intellectual property law is useful for those students who want to learn the fundamentals of intellectual property law either as basis for more advanced courses or to integrate intellectual property law into other substantive courses.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6730 Pension and Employee Benefits
[2-3 credit hours]
A study of the law regarding employment benefits, such as ERISA, focusing on various forms of pension plans, and health and welfare plans. The law will address issues of plan qualification under the tax code and also applicable labor laws and regulations. Some familiarity with tax concepts would be helpful but is not required.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring

LAWI 6740 Public Sector Labor Law
[2-3 credit hours]
This course covers various models of public sector labor relations laws, including but not limited to the Ohio public sector labor statute. It focuses on the differing degrees to which public sector unions in different jurisdictions can bargain, resolve bargaining impasses (through strikes or mediation and arbitration), and enforce contracts with employers. This course also stresses issues unique to the public sector, including constitutional rules, civil service statutes and the rights of individual public employees.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWI 6750 Products Liability
[2-3 credit hours]
An examination of the law relating to products liability. Particular emphasis will be given to strict liability in tort, with coverage of negligence and warranty-based products claims. Discussions will cover design and manufacturing defects and failure to warn. Applications to contemporary problem areas, such as pharmaceuticals, automobiles, and tobacco, will be explored.
Prerequisites: LAWD 6220 with a minimum grade of D- and LAWD 6510 with a minimum grade of D- and LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6780 Remedies
[2-3 credit hours]
The course in Remedies is about the bottom line. It is about what a court can do for a litigant who has been wronged or is about to be wronged. The most common remedies are judgments for money and injunctions against defendants to prevent them from wronging plaintiffs or to require them to undo wrongs. The course takes up questions such as the measure of relief, the relationship between legal and equitable remedies, declaratory remedies, benefit to the defendant as the measure of relief in restitution, punitive remedies, enforcing judgments, equitable defenses, immunities and federal interference with state law enforcement.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6790 Bar Exam Preparation
[2-3 credit hours]
This is a pre-bar preparatory course designed to introduce students to certain critical and analytical and writing skills, techniques, protocols, and frameworks that are essential to maximize bar exam preparation and ultimately pass the bar exam. Students will review outlines for selected substantive topics, complete in-class and at-home simulated bar exam tests and assignments, and receive feedback. Through the use of problems and exercises in a bar exam format, students will become familiar with techniques for answering multiple choice questions, essays, and performance tests that comprise the bar exam in Ohio and other states. It is reserved for third year students and is graded on a satisfactory/unsatisfactory basis.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of C

LAWI 6800 Securities Regulation
[2-3 credit hours]
This course focuses on the disclosure requirements of the federal securities laws which apply when businesses raise capital and when their shares are publicly traded. It examines the requirements of the Securities Act of 1933, selected provisions of the Securities Exchange Act and state blue sky laws. It covers extensively the structuring of exempt transactions for small businesses. The course is taught primarily from a transactional, rather than a litigation, focus.
Prerequisites: LAWM 5000 with a minimum grade of C and LAWG 6010 with a minimum grade of D

LAWI 6810 Sentencing
[2-3 credit hours]
A survey of the law relating to the disposition of individuals convicted of crimes. Topics include sentencing authority, ex post facto laws, factual bases for sentencing, probation, parole, the death penalty, and state and federal sentencing guidelines.
Prerequisites: LAWM 5000 with a minimum grade of C and LAWD 6300 with a minimum grade of C and LAWD 6110 with a minimum grade of C

LAWI 6820 Land Use Planning
[2-3 credit hours]
This course explores the rapidly evolving area of public land use regulation in the context of private property development rights and constitutional protections of those rights. Regulatory areas examined include: zoning, subdivision controls, environmental land use controls, development exactions, aesthetic regulations, and growth controls, as well as land use planning requirements. First and Fifth Amendment issues are explored along with a variety of key public policy questions.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of C

LAWI 6840 International and Domestic Arbitration
[2-3 credit hours]
This course conveys a thorough understanding of the law and practice of arbitration: its practical, doctrinal, theoretical, and policy aspects both in the domestic and international spheres.
Prerequisites: LAWM 5000 with a minimum grade of C
Term Offered: Summer

LAWI 6870 Sports Law
[2-4 credit hours]
A substantive examination of concepts and cases from legal disciplines which affect professional and amateur sports including antitrust law, labor law, contracts, tax, and civil procedure.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6880 Business Bankruptcy
[2-3 credit hours]
This course will explore basic principles of Federal Bankruptcy Law, with particular emphasis on corporate reorganizations under Chapter 11 of the Bankruptcy Code. Topics addressed will include business operations in Chapter 11; the rights and duties of a Chapter 11 debtor; allowance, disallowance, estimations, and subordination of creditor claims; the reduction of secured obligations to the value of collateral; debtor-in-possession financing; preference and fraudulent transfer avoidance actions; and using bankruptcy to effect a sale of assets. This course will also address special rules involving, among others, small business debtors, municipalities, and international (cross-border) insolvency cases.
Prerequisites: LAWM 5000 with a minimum grade of C

LAWI 6900 Trademarks
[2-3 credit hours]
An introduction to the fundamentals of federal trademark law and practice with some discussion of common law trademarks and state trademark registration. This course will cover how trademarks are acquired, trademark registration and practice before the U.S. Patent and Trademark Office, and trademark infringement. False advertising and other forms of unfair competition actionable under the Lanham Act also will be studied.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6930 Water Law
[2-3 credit hours]
This course focuses on the laws governing surface and ground water resources, with an emphasis on allocation and management issues. Because water is perhaps our most vital natural resource, and because it is often in scarce supply relative to demand, disputes over its use have been and will continue to be of crucial importance. Students explore common law, statutory, and constitutional issues at the state and federal levels, including the Clean Water and Safe Drinking Water Acts. Topics crucial to the Great Lakes region are particularly emphasized.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWI 6940 White Collar Crime
[2-3 credit hours]
A survey of the federal criminal law relating to crimes committed by corporations and non-traditional criminals. Topics include corporate criminal liability, wire and mail fraud, RICO, money laundering, false claims and false statements, tax crimes, environmental crimes, perjury, and obstruction of justice.
Prerequisites: LAWM 5000 with a minimum grade of C and LAWD 6300 with a minimum grade of C

LAWI 9000 International Comparative Law
[2-3 credit hours]
This course introduces students to the major legal systems of the world. The first third of the course provides an overview of the major families of law encountered in various nations of the world today: common law (as exemplified by California and England), civil law (France and Germany), religious law (Egypt), and the extra-legal approach seen in various Asian countries (China). The rest of the course examines how each of these systems handles the same types of common legal situation: inheritance and succession, criminal behavior and contracts.

LAWI 9010 Accounting and Financial Statements
[1-3 credit hours]
An introduction for students without prior accounting experience to the terms and concepts necessary to an understanding of the financial affairs of a client and to the variety of legal contexts in which the lawyer is likely to encounter accounting problems. Students will learn to perform basic financial analysis.

LAWI 9020 E-Commerce
[1-3 credit hours]
This course will examine critical information technologies that provide a basis for electronic commerce. Topics include problems surrounding electronic commerce such as security, privacy, content selection and rating, intellectual property rights, authentication, encryption, acceptable use policies, UETA, UCITA and E-Sign.
Term Offered: Spring, Summer

LAWI 9030 Administrative Law
[3 credit hours]
The law and operation of administrative agencies, including agency adjudication, rulemaking, and other forms of policy implementation. The course covers agencies' place in the constitutional structure, legislative and executive controls on agency action, and judicial review of agency fact-finding, statutory interpretation, and exercise of discretion. The course examines state agencies as well as federal agencies and the federal Administrative Procedure Act.
Term Offered: Spring, Summer, Fall

LAWI 9060 Sales and Leases of Goods
[2-3 credit hours]
A detailed study of sales of goods under Article 2 of the Uniform Commercial Code and a survey of both Article 2A of the Uniform Commercial Code (leases of goods) and the U.N. Convention on Contracts for the International Sale of Goods. Topics include contract formation and interpretation, warranties, express and implied terms, risk of loss, performance obligations and breach, and remedies for breach. Consideration may also be given to other state and federal laws affecting sales and leases of goods.
Prerequisites: LAWD 9210 with a minimum grade of C and LAWD 9220 with a minimum grade of C

LAWI 9070 Antitrust
[2-3 credit hours]
This course will cover the role of competition in a modern market economy, federal antitrust law, regulation and policies. Topics covered include horizontal restraints (price fixing, conspiracy, data dissemination, concerted refusals to deal, etc.); monopolization, attempts to monopolize, and oligopoly; problems concerning the relationship of antitrust to patent law; vertical restraints (restricted distribution, typing arrangements, exclusive dealing etc.); mergers (horizontal, vertical and conglomerate); selected Robinson-Patman Act problems, remedies and enforcement.
Term Offered: Fall

LAWI 9080 Gender and the Law
[2-3 credit hours]
This course covers issues of gender and the law with a primary focus on how the law addresses sex discrimination. Students will discuss constitutional and statutory protections against sex discrimination from a doctrinal and theoretical perspective. Subjects covered in this class include employment discrimination, family law, public benefits, domestic violence and sexual orientation and the law.

LAWI 9090 Disability Law
[2-3 credit hours]
This course examines the growing area of disability law. Topics to be covered include discrimination based on disability in employment and public accommodations, as well as the requirement for educational institutions to provide special education services to disabled students. Relevant federal statutes will be examined, including the Americans with Disabilities Act (with special emphasis on the ADA Amendments Act of 2009), Section 504 of the Rehabilitation Act, and the Individuals with Disabilities in Education Act.
Term Offered: Spring, Fall

LAWI 9100 International Law
[3 credit hours]
This course focuses on the legal processes of the international community. The creation of law among nation states, the law-making activities of international organizations, the enforcement (and non-enforcement) of international law in both national and international forums, the limits of national jurisdiction, the responsibility of states for the injuries to the persons or property of aliens, and the rules governing international agreements are surveyed. Particular attention is given to the law of treaties and the role of lawyers in foreign policy decision-making.
Term Offered: Spring, Summer, Fall

LAWI 9110 Commercial Paper
[3 credit hours]
A study of payment systems. Initial emphasis is upon commercial paper (Article 3 of the Uniform Commercial Code) and bank deposits and collections (Article 4 of the Uniform Commercial Code), followed by credit cards (Truth in Lending, Consumer Credit Protection, and Fair Credit Billing Acts), commercial funds transfer (Article 4A of the Uniform Commercial Code), and consumer electronic funds transfer (Electronic Funds Transfers Act).
Term Offered: Spring, Summer, Fall

LAWI 9130 Business Enterprise Tax
[2-3 credit hours]
An examination of the federal income tax treatment of business enterprises (including corporations, partnerships and limited liability companies) and their owners. The course considers the tax consequences of entity-owner transactions (formation and property contributions, distributions, redemptions and liquidations) as well as entity-level transactions (business operations, mergers, acquisitions and other business combinations).
Prerequisites: LAWG 9500 with a minimum grade of D or LAWI 9500 with a minimum grade of D
Term Offered: Spring

LAWI 9200 Jurisprudence
[2-3 credit hours]
Jurisprudence is the philosophy of law. The two primary goals of this class are 1) to give students a basic background and understanding of important legal thinkers and theory and 2) to stimulate critical thinking through assigned readings and rollicking in-class discussions about concepts of law from Plato to present day. We will philosophically analyze concepts of precedence, interpretation, rights, civil disobedience, semantics, and virtues such as justice, desert and compassion.

LAWI 9210 Copyright Law
[2-3 credit hours]
A substantive examination of the Copyright Act. This course will cover the fundamentals of copyright law and practice and the challenges to the existing copyright regime by new technologies.
Term Offered: Spring, Summer, Fall

LAWI 9220 Civil Rights Litigation Simulation
[2-3 credit hours]
This course will explore how to litigate constitutional claims, and how to enforce individual constitutional rights, including Fourth, Eighth, and Fourteenth Amendment claims. The course will cover the relevant case law for a doctrinal overview, as well as the historical and factual backgrounds to the landmark cases in constitutional litigation. The course will also involve simulated law practice problems and other exercises to provide a hands-on approach to the problems and issues that arise in litigating constitutional claims.
Term Offered: Spring, Summer, Fall

LAWI 9260 Race and American Law
[2-3 credit hours]
This course addresses the racial and legal history of the major racial groups in the U.S., including African Americans, Native Americans, Asian Americans, Latinos, and Whites. In addition to these histories, the course includes the following topics: competing definitions of race and racism; race, voting, and participation in democracy; developing notions of equality; segregation and education; and responses to racism, including resistance, coalitions, and healing.
Term Offered: Spring, Summer, Fall

LAWI 9270 Creditor and Debtor Law
[2-3 credit hours]
Explores creditors' rights under state law including judgment liens, execution liens, fraudulent conveyances, set off, assignments to benefit creditors, and statutory liens. Debtor defenses under state and federal law including constitutional protections, exemptions, and counterclaims are evaluated. Following this overview of general creditor execution, the majority of the course is devoted to resolution of claims in federal bankruptcy law.
Term Offered: Spring, Summer, Fall

LAWI 9280 Criminal Procedure-Adjudications
[3 credit hours]
A study of the criminal processes from arrest through sentencing and appeal. Topics covered include bail, preliminary hearing, grand jury, plea bargaining and guilty pleas, discovery, fair trial, free press, jury trial, sentencing, and double jeopardy.
Term Offered: Spring, Fall

LAWI 9300 Employment Discrimination
[3 credit hours]
This course focuses on the main federal statutes prohibiting employment discrimination and the policies underlying these laws, with the majority of time spent on Title VII of the Civil Rights Act of 1964, the Age Discrimination in Employment Act, and the Americans with Disabilities Act. Additional topics and subtopics include sexual harassment, discrimination based on sexual orientation, defenses, and reasonable accommodation of religion.
Term Offered: Spring, Summer, Fall

LAWI 9310 Employment Law
[2-3 credit hours]
This course focuses on the major state and federal employment laws affecting individual employees, excluding laws on unions and employment discrimination. Coverage includes the legal regulation of the hiring and firing process, testing and privacy issues, wage and hour laws, occupational health and safety, workers' compensation, unemployment insurance, covenants not to compete, and related topics.
Term Offered: Spring, Summer, Fall

LAWI 9330 Environmental Law
[2-3 credit hours]
This course provides an introduction to U.S. environmental law by examining major federal statutes and the policy goals underlying them. Key statutes explored include the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act (RCRA), and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Through analyzing and comparing different environmental statutes, students develop an understanding not only of the current environmental regulatory framework, but also of alternative approaches that may be employed to prevent pollution, clean up contamination, and protect the environment.
Term Offered: Spring, Fall

LAWI 9350 Estate Planning
[2-3 credit hours]
This course focuses on the practical and tax aspects of estate planning. Emphasis is placed on the application of estate planning and wealth preservation techniques to commonly encountered estate planning problems.
Prerequisites: LAWG 9710 with a minimum grade of D
Term Offered: Spring, Summer, Fall

LAWI 9360 Estate and Gift Tax
[2-3 credit hours]
A study of the federal estate and gift tax structure and its impact on the gratuitous transfer of property. Income taxation of trusts and estates and the generation skipping transfer tax are also discussed.
Term Offered: Spring, Fall

LAWI 9380 Federal Courts and Federal Rights
[2-3 credit hours]
An intensive examination of the jurisdiction of federal courts, the role of the federal courts within the federal government, and within our federalist system. Topics surveyed include the law applied by federal courts in civil actions, the original and removal jurisdiction of federal courts, the relationship of the federal courts to state courts, congressional power over federal courts, the enforceability of federal law against states, and states' sovereign immunity.
Term Offered: Spring, Summer, Fall

LAWI 9390 Natural Resources Law
[2-3 credit hours]
This course provides an introduction to natural resources law and policy affecting both public lands and private property. Conflicts over natural resources, including their protection and use, are among the most contentious legal and policy issues of our time. Students explore the reasons why, the roles governmental authorities play in the management of natural resources, and the laws and policies pertaining to wildlife, preservation, conservation, protected lands, forestry, mining, oil and gas, water rights, and other natural resources. Key federal statutes such as the National Environmental Policy Act and the Endangered Species Act are reviewed as well as cases, regulations, and commentary.
Term Offered: Spring

LAWI 9400 American Legal History
[2-3 credit hours]
This seminar/course (students may elect either to write a paper or to take an examination) follows the profession's development from the American Revolution through the 1920's and the emergence of university-based professional education, the advent of new client constituencies including corporations, labor organizations, and anti-slavery and other social action groups, the development of standards of professional ethnic and racial minorities. The teaching approach emphasizes comparisons with current practice, critical use of original source materials and development of research and writing skills.

LAWI 9440 Immigration Law
[2-3 credit hours]
The course is designed to present a survey of immigration and nationality law. It will cover issues of citizenship as well as admissions to the United States. The course will address issues of removal and deportation, as well as relief from removal.
Term Offered: Spring, Fall

LAWI 9450 International Intellectual Property
[2-3 credit hours]
This course reviews: the main international intellectual property instruments (such as TRIPS, Paris Convention, Patent Cooperation Treat, European Patent Convention; Madrid Agreement, Berne and Rome conventions, WIPO treaties), and European main legislative texts (mainly regulations and directives) and main case law on patent, trademark and copyright. We also review the principal differences between the common law based system of copyright and the civil law system based on "droit d'auteur" (author's rights), with a special focus on electronic and Internet issues.
Term Offered: Spring, Summer, Fall

LAWI 9460 Insurance Law
[2-3 credit hours]
A survey course covering numerous insurance concepts, including insurance contract formation and interpretation, bad faith, insurance regulation, duty to defend, causation, notice, and misrepresentation. Several forms of insurance will be discussed in detail.
Term Offered: Spring, Summer, Fall

LAWI 9470 Intellectual Property and Licensing
[2-3 credit hours]
This course focuses on the commercialization of intellectual property through the use of assignments and licenses. The course will cover intellectual property assignments and licenses, including express and implied licenses, the scope of licenses, bankruptcy issues, anti-trust issues and international licensing. The course will also cover intellectual property audits and patent, trade secret, copyright and trademark law to the extent an understanding of the rights and obligations inherent in such intellectual property classifications are necessary to effectively assign or license intellectual property. Students will analyze several licenses.
Prerequisites: LAWI 9720 with a minimum grade of D or LAWI 9710 with a minimum grade of D or LAWI 9900 with a minimum grade of D or LAWI 9210 with a minimum grade of D
Term Offered: Spring, Fall

LAWI 9480 International Business Transactions
[2-3 credit hours]
This course introduces students to the issues, problems, and legal norms applicable to International Business Transactions. The course will examine various problems that occur in international business as a means of discerning pitfalls for the unwary, as well as the matters that must be considered to protect one's client. The course will begin with an examination of the issues arising in a basic international sale and will progress through increasingly complex types of business interaction, including distributorships, franchising, licensing, joint ventures, and incorporating abroad. Through the course, there will be an emphasis on the U.S., foreign, and international laws and standards that may affect the transaction. The course will emphasize contract negotiation and drafting skills.
Term Offered: Spring, Summer

LAWI 9490 Juvenile Law
[2-3 credit hours]
An examination of the relationship between children, their parents, siblings, and the state in the lives of delinquent, unruly, dependent, neglected, and abused children. The role of the court, judiciary, attorneys, police, and social services historically, and in modern practice, will be examined as to the impact on families and individuals brought before the juvenile court. Special emphasis will be given to the theory of the juvenile justice system; the various court alternatives to adjudication; dispositional considerations and the attorney's role in representing the child, parents, or serving as a guardian ad litem.
Term Offered: Spring, Fall

LAWI 9500 Federal Income Tax
[3-4 credit hours]
After a brief consideration of the federal income taxation system, this course examines the conceptual problems in defining income. A detailed treatment of the more significant personal and business deductions, exemptions, and credits follows. Statutory methodology and policy considerations (including the tax expenditure concept) are developed integrally with substantive topics. In addition, the course considers the tax treatment of gains and losses from the disposition of property, including the capital gains preference and deferral of taxation. Tax shelters and attempts by Congress and the Internal Revenue Service to limit their utilization may be explored as well.
Term Offered: Spring, Summer, Fall

LAWI 9510 Labor Law
[3 credit hours]
This course focuses on the law governing and policy issues surrounding the major facets of union-management relations in the private sector under the National Labor Relations Act (NLRA). These include union organizing, collective bargaining, contract enforcement, picketing, and the economic weapons of both sides, including strikes. The course also covers the procedural mechanisms by which rights under the NLRA are enforced and remedies for NLRA violations.
Term Offered: Spring, Fall

LAWI 9520 Health Care Finance
[2-3 credit hours]
This course will cover the different problems presented by government regulation versus the private market model focusing on managed care (risk allocation, standard of care, consumer information), insurance (basic models of insurance and underwriting), health care licensing, and related ERISA issues as they affect the delivery of health care services.

LAWI 9530 Consumer Law
[2-3 credit hours]
This course will study the practical application of Consumer Law including student loan law, credit card and debt collection law, Fair Credit Reporting Act, Lemon Law, Predatory Lending, etc.
Term Offered: Spring, Fall

LAWI 9550 Health Care Fraud and Abuse
[2-3 credit hours]
The high cost of health care in the United States is exacerbated by rampant fraud and abuse on state and federal health care systems. This course presents an overview of legal and policy issues related to health care fraud and practical issues related to the prosecution and defense of heath care fraud-related suits. Pre- and post-litigation issues, such as corporate compliance programs, administrative investigations, and corporate integrity agreements, will also be explored. Course materials will cover major health care fraud and abuse statutes, including statutes addressing false claims, kickbacks, and self-referrals, as well as the regulatory regimes and administrative rulings that govern this area of the law. Students will be evaluated on one or more written assignments and exercises.
Term Offered: Spring

LAWI 9560 Real Estate Transactions
[2-3 credit hours]
The course will address the purchase and sale, financing and leasing of real property. Students will draft various documents common in real estate transactions. Assignments will be reviewed, critiqued and revised in order to enhance drafting skills.
Term Offered: Spring

LAWI 9570 Health Care Provider Liability
[2-3 credit hours]
This advanced torts course covers quality control in health care, medical malpractice, informed consent, medical confidentiality and institutional liability for medical injury. It includes causes of action against individual and institutional health care providers as well as third party payors, including insurers and managed care organizations. Tort reform issues are also addressed.

LAWI 9630 Health Law
[2-3 credit hours]
This course provides an overview of the legal issues that arise in the health care field. Topics surveyed will include individual and institutional liability, public and private regulation, accreditation and licensure, hospital/medical staff relationships, and the challenge of achieving cost efficiencies, while also maintaining high quality care and improved access to care. Students will learn to identify key legal issues affecting the operation of a health care entity.
Term Offered: Spring, Fall

LAWI 9680 State and Local Government Law and Taxation
[2-3 credit hours]
An overview of the law relating to the administration of municipalities and their dealings with other local governmental units. Topics include the powers and problems of urban governmental units, federalism, corporate powers and police powers. Coverage includes the basic law and rules relating to the financing of local government and the various sources of tax revenue for local governments.
Term Offered: Spring

LAWI 9700 Patent Practice and Procedure
[2-3 credit hours]
A hands-on course focusing on both regulatory requirements and attorney skills relating to representation of inventors before the Patent and Trademark Office. The course will follow a patent attorney's relationship with an inventor and the written PTO responses, appeals, and finally, patent grant.
Term Offered: Spring, Fall

LAWI 9710 Patent Law
[2-3 credit hours]
A survey of the legal protection of inventions. This course covers the requirements for obtaining and enforcing a patent and the rights of a patentee with respect to licensing, assignment, and patent misuse.
Term Offered: Spring, Fall

LAWI 9720 Intellectual Property Survey
[2-3 credit hours]
A preparatory course covering Copyright, Patent, Trademark, and Trade Secret Law. A broad coverage of intellectual property law is useful for those students who want to learn the fundamentals of intellectual property law either as basis for more advanced courses or to integrate intellectual property law into other substantive courses.
Term Offered: Spring, Summer, Fall

LAWI 9730 Pension and Employee Benefits
[2-3 credit hours]
A study of the law regarding employment benefits, such as ERISA, focusing on various forms of pension plans, and health and welfare plans. The law will address issues of plan qualification under the tax code and also applicable labor laws and regulations. Some familiarity with tax concepts would be helpful but is not required.
Term Offered: Spring

LAWI 9740 Public Sector Labor Law
[2-3 credit hours]
This course covers various models of public sector labor relations laws, including but not limited to the Ohio public sector labor statute. It focuses on the differing degrees to which public sector unions in different jurisdictions can bargain, resolve bargaining impasses (through strikes or mediation and arbitration), and enforce contracts with employers. This course also stresses issues unique to the public sector, including constitutional rules, civil service statutes and the rights of individual public employees.
Term Offered: Spring, Summer, Fall

LAWI 9750 Products Liability
[2-3 credit hours]
An examination of the law relating to products liability. Particular emphasis will be given to strict liability in tort, with coverage of negligence and warranty-based products claims. Discussions will cover design and manufacturing defects and failure to warn. Applications to contemporary problem areas, such as pharmaceuticals, automobiles, and tobacco, will be explored.
Prerequisites: (LAWD 9510 with a minimum grade of D and LAWD 9220 with a minimum grade of D)

LAWI 9780 Remedies
[2-3 credit hours]
The course in Remedies is about the bottom line. It is about what a court can do for a litigant who has been wronged or is about to be wronged. The most common remedies are judgments for money and injunctions against defendants to prevent them from wronging plaintiffs or to require them to undo wrongs. The course takes up questions such as the measure of relief, the relationship between legal and equitable remedies, declaratory remedies, benefit to the defendant as the measure of relief in restitution, punitive remedies, enforcing judgments, equitable defenses, immunities and federal interference with state law enforcement.
Term Offered: Spring, Fall

LAWI 9790 Bar Exam Preparation
[2-3 credit hours]
This is a pre-bar preparatory course designed to introduce students to certain critical and analytical and writing skills, techniques, protocols, and frameworks that are essential to maximize bar exam preparation and ultimately pass the bar exam. Students will review outlines for selected substantive topics, complete in-class and at-home simulated bar exam tests and assignments, and receive feedback. Through the use of problems and exercises in a bar exam format, students will become familiar with techniques for answering multiple choice questions, essays, and performance tests that comprise the bar exam in Ohio and other states. It is reserved for third year students and is graded on a satisfactory/unsatisfactory basis.
Term Offered: Spring, Fall

LAWI 9800 Securities Regulation
[2-3 credit hours]
This course focuses on the disclosure requirements of the federal securities laws which apply when businesses raise capital and when their shares are publicly traded. It examines the requirements of the Securities Act of 1933, selected provisions of the Securities Exchange Act and state blue sky laws. It covers extensively the structuring of exempt transactions for small businesses. The course is taught primarily from a transactional, rather than a litigation, focus.
Prerequisites: LAWG 9010 with a minimum grade of D
Term Offered: Spring, Fall

LAWI 9810 Sentencing
[2-3 credit hours]
A survey of the law relating to the disposition of individuals convicted of crimes. Topics include sentencing authority, ex post facto laws, factual bases for sentencing, probation, parole, the death penalty, and state and federal sentencing guidelines.
Prerequisites: LAWD 9300 with a minimum grade of C and LAWD 9110 with a minimum grade of C
Term Offered: Spring, Summer, Fall

LAWI 9820 Land Use Planning
[2-3 credit hours]
This course explores the rapidly evolving area of public land use regulation in the context of private property development rights and constitutional protections of those rights. Regulatory areas examined include: zoning, subdivision controls, environmental land use controls, development exactions, aesthetic regulations, and growth controls, as well as land use planning requirements. First and Fifth Amendment issues are explored along with a variety of key public policy questions.
Term Offered: Fall

LAWI 9840 International and Domestic Arbitration
[2-3 credit hours]
This course conveys a thorough understanding of the law and practice of arbitration: its practical, doctrinal, theoretical, and policy aspects both in the domestic and international spheres.
Term Offered: Spring, Summer, Fall

LAWI 9870 Sports Law
[2-4 credit hours]
A substantive examination of concepts and cases from legal disciplines which affect professional and amateur sports including antitrust law, labor law, contracts, tax, and civil procedure.
Term Offered: Spring

LAWI 9880 Business Bankruptcy
[2-3 credit hours]
This course will explore basic principles of Federal Bankruptcy Law, with particular emphasis on corporate reorganizations under Chapter 11 of the Bankruptcy Code. Topics addressed will include business operations in Chapter 11; the rights and duties of a Chapter 11 debtor; allowance, disallowance, estimations, and subordination of creditor claims; the reduction of secured obligations to the value of collateral; debtor-in-possession financing; preference and fraudulent transfer avoidance actions; and using bankruptcy to effect a sale of assets. This course will also address special rules involving, among others, small business debtors, municipalities, and international (cross-border) insolvency cases.
Term Offered: Fall

LAWI 9900 Trademarks
[2-3 credit hours]
An introduction to the fundamentals of federal trademark law and practice with some discussion of common law trademarks and state trademark registration. This course will cover how trademarks are acquired, trademark registration and practice before the U.S. Patent and Trademark Office, and trademark infringement. False advertising and other forms of unfair competition actionable under the Lanham Act also will be studied.
Term Offered: Spring, Fall

LAWI 9930 Water Law
[2-3 credit hours]
This course focuses on the laws governing surface and ground water resources, with an emphasis on allocation and management issues. Because water is perhaps our most vital natural resource, and because it is often in scarce supply relative to demand, disputes over its use have been and will continue to be of crucial importance. Students explore common law, statutory, and constitutional issues at the state and federal levels, including the Clean Water and Safe Drinking Water Acts. Topics crucial to the Great Lakes region are particularly emphasized.
Term Offered: Spring, Summer

LAWI 9940 White Collar Crime
[3 credit hours]
White collar crime is variously understood to refer to economic and political crimes, crimes predicated on deceit or concealment, and crimes in corporate or other professional contexts. While the definition is imprecise, the legal profession routinely treats white collar crime as distinct from other crime; prosecutors and defense counsel often specialize in white collar matters. This course is divided into two parts. First, the class surveys some of the key substantive laws involved in white collar cases. Second, it examines the distinctive procedural issues in white collar cases, including sentencing.
Prerequisites: LAWD 9300 with a minimum grade of C
Term Offered: Fall

Law (Law Revw and Moot Court) (LAWL)

LAWL 6110 Law Review I
[1-2 credit hours]
Course is graded on a Satisfactory/Unsatisfactory basis. Course requires the successful completion of a publishable manuscript as determined by the editor-in-chief and faculty adviser of the Law Review.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWL 6120 Law Review II
[1-2 credit hours]
Only students who have successfully completed Law Review I and who are serving as editors of the Law Review will be permitted to register for Law Review II. Enrollment is selective.
Prerequisites: LAWL 6110 with a minimum grade of S

LAWL 6150 Moot Court I
[1-2 credit hours]
Students participate in interscholastic Moot Court competitions, each of which deals with a particular area of law, such as: international law, labor and employment law, corporate law, sports law, tax, intellectual property, criminal law and constitutional law. Students will prepare a brief and present an appellate argument at a regional or national competition.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWL 6160 Moot Court II
[1-2 credit hours]
Students participate in or coach Moot Court or Trial Advocacy teams. Students are also required to judge rounds of the annual Fornoff Moot Court competition.
Prerequisites: LAWL 6150 with a minimum grade of S

LAWL 6180 Trial Advocacy I
[1-2 credit hours]
Students participate in interscholastic trial advocacy competitions. Students on the trial advocacy team will conduct a trial against counsel from other schools; including making opening and closing statements, introducing evidence and examining and cross-examining witnesses.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWL 6190 Trial Advocacy II
[1-2 credit hours]
Students participate in and/or judge interscholastic trial advocacy competitions. Students on the trial advocacy team will conduct a trial against counsel from other schools; including making opening and closing statements, introducing evidence and examining and cross-examining witnesses.
Prerequisites: LAWL 6180 with a minimum grade of S

LAWL 9110 Law Review I
[1-2 credit hours]
Course is graded on a Satisfactory/Unsatisfactory basis. Course requires the successful completion of a publishable manuscript as determined by the editor-in-chief and faculty advisor of the Law Review.
Term Offered: Spring, Fall

LAWL 9120 Law Review II
[1-2 credit hours]
Only students who have successfully completed Law Review I and who are serving as editors of the Law Review will be permitted to register for Law Review II. Enrollment is selective.
Prerequisites: LAWL 9110 with a minimum grade of S
Term Offered: Spring, Fall

LAWL 9150 Moot Court I
[1-2 credit hours]
Students participate in interscholastic Moot Court competitions, each of which deals with a particular area of law, such as: international law, labor and employment law, corporate law, sports law, tax, intellectual property, criminal law and constitutional law. Students will prepare a brief and present an appellate argument at a regional or national competition.
Term Offered: Spring, Fall

LAWL 9160 Moot Court II
[1-2 credit hours]
Students participate in or coach Moot Court or Trial Advocacy teams. Students are also required to judge rounds of the annual Fornoff Moot Court competition.
Prerequisites: LAWL 9150 with a minimum grade of S
Term Offered: Spring, Fall

LAWL 9180 Trial Advocacy I
[1-2 credit hours]
Students participate in interscholastic trial advocacy competitions. Students on the trial advocacy team will conduct a trial against counsel from other schools; including making opening and closing statements, introducing evidence and examining and cross-examining witnesses.
Term Offered: Spring, Fall

LAWL 9190 Trial Advocacy II
[1-2 credit hours]
Students participate in and/or judge interscholastic trial advocacy competitions. Students on the trial advocacy team will conduct a trial against counsel from other schools; including making opening and closing statements, introducing evidence and examining and cross-examining witnesses.
Prerequisites: LAWL 9180 with a minimum grade of S
Term Offered: Spring, Fall

Law (Masters Program) (LAWM)

LAWM 5000 Law And The Legal System
[2-3 credit hours]
This course introduces students to the U.S. legal system, including cases, statutes, and other sources of law; federal, state, trial, and appellate courts; legal reasoning; and principles of contracts, torts, property, criminal, and constitutional law. Not for J.D. degree credit; serves as prerequisite for non-J.D. students to take other College of Law courses.
Term Offered: Fall

Law (Special Topics) (LAWT)

LAWT 6600 Special Topics
[1-6 credit hours]
Courses covering special topics and current events.
Term Offered: Spring, Summer, Fall

LAWT 9600 Special Topics
[0-6 credit hours]
Courses covering special topics and current events.
Term Offered: Spring, Summer, Fall

Law (Upper Level Required) (LAWA)

LAWA 6000 Legal Ethics and Professional Responsibility
[3 credit hours]
An introduction to legal and ethical principles governing lawyers, the legal profession, and the practice of law. The course considers the principal ways in which lawyers are regulated through bar admission, professional codes, lawyer disciplinary actions, and civil liability. The course explores the lawyer-client relationship and the scope and limits of duties to the client, the legal system, and third parties.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-

LAWA 6010 Civil Procedure - Jurisdiction
[3 credit hours]
Study of the rules controlling the jurisdiction of courts. State and federal systems are covered.
Prerequisites: LAWM 5000 with a minimum grade of C

LAWA 6120 Constitutional Law - Rights
[3 credit hours]
This course covers the state action doctrine and various individual rights, including those protected by the Equal Protection, Free Speech, and Religion Clauses.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWA 6310 Evidence
[4 credit hours]
The rules and policies governing a trial court's fact-finding process, as exemplified by the Federal Rules of Evidence. Topics cover the full range of evidentiary issues at trial, including the content of admissible proof, the matter of presenting it, and the respective roles of the judge and jury.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring

LAWA 6400 Advanced Research and Writing
[1 credit hour]
This course involves an advanced writing project completed under the supervision of a full-time faculty member.
Term Offered: Spring, Summer, Fall

LAWA 9000 Legal Ethics and Professional Responsibility
[3 credit hours]
An introduction to legal and ethical principles governing lawyers, the legal profession, and the practice of law. The course considers the principal ways in which lawyers are regulated through bar admission, professional codes, lawyer disciplinary actions, and civil liability. The course explores the lawyer-client relationship and the scope and limits of duties to the client, the legal system, and third parties.
Term Offered: Spring, Summer, Fall

LAWA 9010 Civil Procedure - Jurisdiction
[3 credit hours]
Study of the rules controlling the jurisdiction of courts. State and federal systems are covered.
Term Offered: Spring, Fall

LAWA 9120 Constitutional Law - Rights
[3 credit hours]
This course covers the state action doctrine and various individual rights, including those protected by the Equal Protection, Free Speech, and Religion Clauses.
Term Offered: Spring, Summer, Fall

LAWA 9310 Evidence
[4 credit hours]
The rules and policies governing a trial court's fact-finding process, as exemplified by the Federal Rules of Evidence. Topics cover the full range of evidentiary issues at trial, including the content of admissible proof, the matter of presenting it, and the respective roles of the judge and jury.
Term Offered: Spring, Summer, Fall

LAWA 9400 Advanced Research and Writing
[1 credit hour]
This course involves an advanced writing project completed under the supervision of a full-time faculty member.
Prerequisites: LAWD 9750 with a minimum grade of C or LAWD 9760 with a minimum grade of C
Term Offered: Spring, Summer, Fall

Law (Writing and Indep Resrch) (LAWP)

LAWP 6000 Seminar
[2-3 credit hours]
Seminars are offered in a wide variety of subject areas. In addition to class work, seminars require a substantial research project.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWP 6010 Honors Research I
[2 credit hours]
A student who has completed 30 semester hours in the College of Law and who has a cumulative grade point average of 3.0 or higher may apply to undertake honors research. The student must submit a topic and detailed research proposal four weeks prior to enrollment to a faculty member who agrees to take primary responsibility to supervise the student's work. Two other faculty members are appointed by the Dean to serve on the student's advisory committee. The research and writing take place over two semesters and culminate in a written thesis intended for publication. The student must orally defend his or her thesis before the advisory committee and interested members of the University community. The purpose of the program is to provide an opportunity for students to make a contribution to the professional literature through concentrated study in an area of interest. The advisory committee decides on the grade that will be awarded to the project.
Prerequisites: LAWM 5000 with a minimum grade of C

LAWP 6020 Honors Research II
[2 credit hours]
A student who has completed 30 semester hours in the College of Law and who has a cumulative grade point average of 3.0 or higher may apply to undertake honors research. The student must submit a topic and detailed research proposal four weeks prior to enrollment to a faculty member who agrees to take primary responsibility to supervise the student's work. Two other faculty members are appointed by the Dean to serve on the student's advisory committee. The research and writing take place over two semesters and culminate in a written thesis intended for publication. The student must orally defend his or her thesis before the advisory committee and interested members of the University community. The purpose of the program is to provide an opportunity for students to make a contribution to the professional literature through concentrated study in an area of interest. The advisory committee decides on the grade that will be awarded to the project.
Prerequisites: LAWP 6010 (may be taken concurrently)

LAWP 6050 Independent Research
[2 credit hours]
A student who has completed at least 30 semester hours in the College of Law and who has a grade point average of 2.0 or higher may undertake and complete individual research and writing for credit under an Independent Research Program. To enroll in the program, a student must submit a written proposal to the faculty member agreeing to take primary responsibility for that student. If the faculty member and the Dean approve the proposal, the student may then enroll for two hours of credit for one semester. The supervising faculty member decides on the grade that will be awarded to the project.
Prerequisites: LAWM 5000 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

LAWP 9000 Seminar
[2-3 credit hours]
Seminars are offered in a wide variety of subject areas. In addition to class work, seminars require a substantial research project.
Term Offered: Spring, Summer, Fall

LAWP 9010 Honors Research I
[2 credit hours]
A student who has completed 30 semester hours in the College of Law and who has a cumulative grade point average of 3.0 or higher may apply to undertake honors research. The student must submit a topic and detailed research proposal four weeks prior to enrollment to a faculty member who agrees to take primary responsibility to supervise the student's work. Two other faculty members are appointed by the Dean to serve on the student's advisory committee. The research and writing take place over two semesters and culminate in a written thesis intended for publication. The student must orally defend his or her thesis before the advisory committee and interested members of the University community. The purpose of the program is to provide an opportunity for students to make a contribution to the professional literature through concentrated study in an area of interest. The advisory committee decides on the grade that will be awarded to the project.
Term Offered: Fall

LAWP 9020 Honors Research II
[2 credit hours]
A student who has completed 30 semester hours in the College of Law and who has a cumulative grade point average of 3.0 or higher may apply to undertake honors research. The student must submit a topic and detailed research proposal four weeks prior to enrollment to a faculty member who agrees to take primary responsibility to supervise the student's work. Two other faculty members are appointed by the Dean to serve on the student's advisory committee. The research and writing take place over two semesters and culminate in a written thesis intended for publication. The student must orally defend his or her thesis before the advisory committee and interested members of the University community. The purpose of the program is to provide an opportunity for students to make a contribution to the professional literature through concentrated study in an area of interest. The advisory committee decides on the grade that will be awarded to the project.
Prerequisites: LAWP 9010 (may be taken concurrently)
Term Offered: Spring

LAWP 9050 Independent Research
[2 credit hours]
A student who has completed at least 30 semester hours in the College of Law and who has a grade point average of 2.0 or higher may undertake and complete individual research and writing for credit under an Independent Research Program. To enroll in the program, a student must submit a written proposal to the faculty member agreeing to take primary responsibility for that student. If the faculty member and the Dean approve the proposal, the student may then enroll for two hours of credit for one semester. The supervising faculty member decides on the grade that will be awarded to the project.
Term Offered: Spring, Summer, Fall

Legal Specialties (LGL)

LGL 6100 Legal Issues for the Elderly
[3 credit hours]
A comprehensive review of legal issues affecting elderly people, including estate planning, trusts, guardianships, powers of attorney, advance directives, social security, Medicare, Medicaid, grandparents' rights, and prenuptial agreements.
Term Offered: Summer, Fall

LGL 6400 Health Issues Patient Advocacy
[3 credit hours]
This course will focus on health related legal, regulatory and ethical matters, patient advocates may face. A review of the United States health system, medical ethics, ethics committees, and public health care policies will be discussed.
Term Offered: Spring

LGL 6600 Guided Study Patient Advocacy
[3 credit hours]
An exploration of Patient Advocacy topics or issues through advanced study of journal articles, research, readings, case studies, on-line postings, and on-line discussions, culminating in the completion of a reflective paper or thesis on a topic in the field of Patient Advocacy.
Term Offered: Spring

LGL 6980 Special Topics
[3 credit hours]
Content may vary, covering some aspect of the law or some area of special interest to the student and instructor. Students may repeat the course for credit as topics vary.
Term Offered: Summer

Linguistics (LING)

LING 5150 Fundamentals Of Linguistics
[3 credit hours]
Formal techniques required for the synchronic and diachronic study of language.
Term Offered: Spring, Fall

LING 5190 Sociolinguistics
[3 credit hours]
Combines linguistic and societal concerns through empirical research.
Term Offered: Spring, Fall

LING 5210 Issues In Esl Writing
[3 credit hours]
Course content includes key concepts in ESL writing instruction and research; characteristics of second language writers and their texts; curricular options; and responding to and assessing ESL writing.
Term Offered: Spring, Fall

Management (MGMT)

MGMT 5110 Introduction To Management
[3 credit hours]
Course is designed to provide a comprehensive, accurate and up-to-date picture of the field of management. This course focuses on organizational behavior (individual and small group) and organizational theory (large group and total organization). Also included is a review of the key functions of management; (1) planning, (2) organizing, (3) leading, (4) staffing and (5) controlling.
Term Offered: Summer

MGMT 6100 Leading Through Ethical Decision-Making
[3 credit hours]
This course seeks to challenge students to discover their core values and how they shape beliefs and actions. Students will learn how to apply four theoretical perspectives to issues facing them as business persons.
Term Offered: Spring, Fall

MGMT 6150 Leading and Developing Yourself
[3 credit hours]
This course explores how one's own leadership competencies can be developed and applied most effectively in a variety of situations. Contemporary theories and trends in leadership and leadership development are examined, and opportunities to improve leadership capabilities are provided. Self-assessments, as well as written and video cases, are used extensively.
Term Offered: Spring, Fall

MGMT 6190 Leading change and Organizational Improvement
[3 credit hours]
Students will learn and apply the key theories and practices of change management and organizational development processes.
Term Offered: Spring, Fall

MGMT 6200 Transitions to Leadership
[3 credit hours]
This course prepares emerging leaders to transition effectively from individual contributor to leader, as well as current leaders to move to the next level of their careers. Through applied frameworks and experiential learning, participants develop essential skills in communication, feedback, delegation, and time management while addressing real-world leadership challenges that build credibility, influence, and confidence.
Term Offered: Spring, Fall

MGMT 6930 Independent Research
[1-3 credit hours]
Independent research opportunities are provided to advanced students for pursuing topics in depth under the faculty supervision.
Term Offered: Spring, Summer, Fall

Manufacturing Management (MFGM)

MFGM 8960 Dissertation
[1-8 credit hours]
Dissertation
Term Offered: Spring, Summer, Fall

Marketing (MKTG)

MKTG 6140 Relationship Marketing
[3 credit hours]
This course focuses on a relational approach to developing and maintaining long-term relationships with both in individual and B2B customer contexts. It explores the roles of customer experience, customer satisfaction, and customer-centricity in driving customer retention, customer loyalty, and customer lifetime value. The scope of customer relationship marketing strategies and programs, as well as the importance of internal customers such as employees in driving customer relationships, is addressed, as is the use of social media and other digital methods in relationship building.
Term Offered: Spring, Summer, Fall

MKTG 6220 Strategic Customer Insight & Analysis
[3 credit hours]
Marketing success requires the ability to uncover genuine insights about customers. This course is designed to help explore customer insights from a theoretical (customer behavior) and analytical (market research) perspective. Students will learn the concepts and tools to understand customers for better value creation.
Term Offered: Spring, Summer, Fall

MKTG 6230 Digital Marketing
[3 credit hours]
This class utilizes marketing theory and analytics in online environments to learn how to create and refine marketing messages and position brands and products for optimum success in the digital era.#The focus is on developing strategic understanding of digital marketing concepts and tools such that it can be applied even as the area continues to evolve.
Term Offered: Spring, Summer, Fall

MKTG 6240 Sales Force Leadership and Strategy
[3 credit hours]
The purpose of this course is to expose students to the functions, problems, and strategies encountered by managers of a sales organization. Primarily, course material will be studied from the perspectives of the leader or manager whose responsibility it is to direct, supervise, motivate, and evaluate direct reporting sales people (i.e., "the salesforce"). This will be done using a variety of learning techniques tailored to the graduate level student studying in an online or blended learning environment.
Prerequisites: MKTG 5410 with a minimum grade of C or BUAD 3010 with a minimum grade of C
Term Offered: Spring, Summer, Fall

MKTG 6250 Global Sales and Sales Management
[3 credit hours]
This course examines the roles and functions of the business-to-business salesperson in managing customers in a global environment. In addition, students will be exposed to the functions, problems, and strategies encountered by managers of the sales organization (the sales manager). Course material will be studied from the perspective of both salesperson and sales manager.
Term Offered: Spring, Summer, Fall

MKTG 6320 Strategic Brand Management
[3 credit hours]
Course will address the strategic importance of branding and will focus on the design and implementation of marketing Programs and activities to build, measure, and manage brand equity.
Term Offered: Spring, Summer, Fall

MKTG 6400 International Marketing
[3 credit hours]
This course focuses on various key trends to align with global market demands while preparing graduates for success in international business. Curriculum emphasizes developing skills in sustainable corporate practices and measuring outcomes, cross-cultural communication strategies, foreign market entry and growth, and logistics and supply chain management. This will be done using a variety of inquiry-based learning methodologies including case study analyses, one-on-one conversations with international business practitioners, and a cross-cultural term project utilizing analytical thinking and independent analysis.
Term Offered: Spring, Fall

MKTG 6980 Special Topics
[3 credit hours]
Current issues/developments in marketing, international business, or business economics are discussed.
Term Offered: Spring, Summer, Fall

MKTG 6990 Independent Study
[1-3 credit hours]
Independent study in marketing, international business, or business economics. A proposal for the independent study must be approved by faculty member and department chair.
Term Offered: Spring, Summer, Fall

Master of Liberal Studies (MLS)

MLS 6000 Introduction to Interdisciplinary Studies
[3 credit hours]
A gateway experience for incoming Master of Arts in Interdisciplinary Studies students. Students will learn the conventions and expectations of graduate-level reading, writing, research, critical analysis, and explore the concept of interdisciplinarity.
Term Offered: Spring, Summer, Fall

MLS 6010 MLS Seminar in Humanities
[3 credit hours]
Introduction to the concerns and methods of graduate study in the Humanities. This course will demonstrate, through readings from different eras, the interrelated nature of literature, philosophy and history.
Term Offered: Spring, Summer, Fall

MLS 6020 Mls Seminar In Social Sciences
[3 credit hours]
Drawing from major principles and concepts in the social sciences, this course examines issues of the individual and society from a range of disciplinary approaches. Special topics vary.
Term Offered: Spring, Summer, Fall

MLS 6030 Mls Seminar In Natural Sciences
[3 credit hours]
This course discusses the major ideas of the natural sciences in terms of their impact upon the human species. Specific topics vary.
Term Offered: Spring, Summer, Fall

MLS 6040 Mls Seminar In The Visual And Performing Arts
[3 credit hours]
An examination of the concept of creativity in the fields of visual art, theater, dance and music. Topics covered vary with instructor.
Term Offered: Spring, Summer, Fall

MLS 6100 Interdisciplinary Research Methods
[3 credit hours]
Exploration of what it means to use interdisciplinary approaches to research and writing. The course focuses on the logic of interdisciplinary research and how to use disciplinary research epistemologies in interdisciplinary projects. The course also discusses institutional Review Boards and ethical treatment of human subjects in research.
Term Offered: Spring, Fall

MLS 6400 Studies In Humanities
[1-6 credit hours]
Individually supervised study in the humanities. Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Summer, Fall

MLS 6500 Studies In Social Sciences
[1-6 credit hours]
Individually supervised study in the social sciences. Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Summer, Fall

MLS 6600 Studies In Natural Sciences
[1-6 credit hours]
Individually supervised study in the natural sciences. Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Fall

MLS 6700 Studies In The Visual And Performing Arts
[1-6 credit hours]
Individualized or small-group study in the visual and performing arts.
Term Offered: Spring, Summer, Fall

MLS 6970 Masters of Liberal Studies Project
[1-6 credit hours]
Creative or applied capstone project supervised by faculty advisor and committee.
Term Offered: Spring, Summer, Fall

MLS 6990 Mls Thesis
[1-6 credit hours]
Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Summer, Fall

Mathematics (MATH)

MATH 5300 Linear Algebra I
[3 credit hours]
Theory of vector spaces and linear transformations, including such topics as matrices, determinants, inner products, eigenvalues and eigenvectors, and rational and Jordan canonical forms.
Term Offered: Fall

MATH 5330 Abstract Algebra I
[3 credit hours]
Arithmetic of the integers, unique factorization and modular arithmetic; group theory including normal subgroups, factor groups, cyclic groups, permutations, homomorphisms, the isomorphism theorems, abelian groups and p-groups.
Term Offered: Fall

MATH 5340 Abstract Algebra II
[3 credit hours]
Ring theory including integral domains, field of quotients, homomorphisms, ideals, Euclidean domains, polynomial rings, vector spaces, roots of polynomials and field extensions.
Prerequisites: MATH 5330 with a minimum grade of D-
Term Offered: Spring

MATH 5350 Applied Linear Algebra
[3 credit hours]
Matrices, systems of equations, vector spaces, linear transformations, determinants, eigenvalues and eigenvectors, generalized inverses, rank, numerical methods and applications to various areas of science.
Term Offered: Spring, Summer

MATH 5380 Discrete Structures And Analysis Algorithms
[3 credit hours]
Discrete mathematical structures for applications in computer science such as graph theory, combinatorics, groups theory, asymptotics, recurrence relations and analysis of algorithms.
Prerequisites: MATH 3320 with a minimum grade of D- or MATH 5330 with a minimum grade of D-
Term Offered: Fall

MATH 5450 Introduction To Topology I
[3 credit hours]
Metric spaces, topological spaces, continuous maps, bases and sub-bases, closure and interior operators, products, subspaces, sums, quotients, separation axioms, compactness and local compactness.
Term Offered: Fall

MATH 5460 Introduction To Topology II
[3 credit hours]
Connectedness and local connectedness, convergence, metrization, function spaces. The fundamental groups and its properties, covering spaces, classical applications, e.g. Jordan Curve Theorem, Fundamental Theorem of Algebra, Brouwer's Fixed Point Theorem.
Prerequisites: MATH 5450 with a minimum grade of D-
Term Offered: Spring

MATH 5540 Classical Differential Geometry I
[3 credit hours]
Smooth curves in Euclidean space including the Frenet formulae. Immersed surfaces with the Gauss map, principal curvatures and the fundamental forms. Special surfaces including ruled surfaces and minimal surfaces. Intrinsic Geometry including the Gauss Theorem Egregium.

MATH 5550 Classical Differential Geometry II
[3 credit hours]
Tensors, vector fields and the Cartan approach to surface theory, Bonnet's Theorem and the construction of surfaces via solutions of the Gauss Equation. Geodesics, parallel transport and Jacobi Fields. Theorems of a global nature such as Hilbert's Theorem or the Theorem of Hopf-Rinow.
Prerequisites: MATH 5540 with a minimum grade of D-

MATH 5600 Advanced Statistical Methods I
[3 credit hours]
Basics of descriptive statistics, study designs and statistical inference. Properties of, and assumptions required for, inference for means, variances, and proportions from one and two-sample paired and unpaired studies. Introduction to ANOVA with multiple comparisons and multiple regression. Model assessment and diagnostics. Statistical software will be employed. Opportunities to apply procedures to real data. Emphasis placed on the foundations to approaches in introductory statistics.
Term Offered: Fall

MATH 5610 Advanced Statistical Methods II
[3 credit hours]
Statistical/biostatistical concepts and methods. Broad subject categories that may be included are study design, longitudinal data analysis, survival analysis, logistic regression, random and mixed effects models. Other topics applicable to current statistical consulting projects, or related to modern data analytics, may be introduced. Appropriate statistical software will be employed.
Prerequisites: MATH 5600 with a minimum grade of C-
Term Offered: Spring

MATH 5620 Linear Statistical Models
[3 credit hours]
Multiple regression, analysis of variance and covariance, general linear models and model building for linear models. Experimental designs include one-way, randomized block, Latin square, factorial and nested designs.
Prerequisites: MATH 6650 with a minimum grade of D-
Term Offered: Spring

MATH 5630 Theory And Methods Of Sample Surveys
[3 credit hours]
The mathematical basis to estimation in various sampling contexts, including probability proportional to size sampling, stratified sampling, two-stage cluster sampling and double sampling, is developed.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 5640 Statistical Computing
[3 credit hours]
Modern statistical computing, including programming tools, modern programming methodologies, design of data structures and algorithms, numerical computing and graphics. Additional topics selected from simulation studies, inversion of probability integral transforms, rejection sampling, importance sampling, Monte Carlo integration, bootstrapping and optimization.
Term Offered: Fall

MATH 5680 Introduction To Theory Of Probability
[3 credit hours]
Probability spaces, random variables, probability distributions, moments and moment generating functions, limit theorems, transformations and sampling distributions.
Prerequisites: (MATH 3190 with a minimum grade of D- and MATH 5350 with a minimum grade of D-)
Term Offered: Summer, Fall

MATH 5690 Introduction To Mathematical Statistics
[3 credit hours]
Sampling distributions, point estimation, interval estimation, hypothesis testing, regression and analysis of variance.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Spring

MATH 5710 Methods Of Numerical Analysis I
[3 credit hours]
Floating point arithmetic; polynomial interpolation; numerical solution of nonlinear equations; Newton's method. Likely topics include: numerical differentiation and integration; solving systems of linear equations; Gaussian elimination; LU decomposition; Gauss-Seidel method.
Term Offered: Spring, Fall

MATH 5720 Methods Of Numerical Analysis II
[3 credit hours]
Likely topics include: Computation of eigenvalues and eigenvectors; solving systems of nonlinear equations; least squares approximations; rational approximations; cubic splines; fast Fourier transforms; numerical solutions to initial value problems; ordinary and partial differential equations.
Prerequisites: MATH 5710 with a minimum grade of D-
Term Offered: Spring

MATH 5780 Advanced Calculus
[3 credit hours]
Extrema for functions of one or more variables, Lagrange multipliers, indeterminate forms, inverse and implicit function theorems, uniform convergences, power series, transformations, Jacobians, multiple integrals.

MATH 5800 Ordinary Differential Equations
[3 credit hours]
Modern theory of differential equations; transforms and matrix methods; existence theorems and series solutions; and other selected topics.
Term Offered: Spring, Fall

MATH 5810 Partial Differential Equations
[3 credit hours]
First and second order equations; numerical methods; separation of variables; solutions of heat and wave equations using eigenfunction techniques; and other selected topics.
Term Offered: Spring

MATH 5820 Introduction To Real Analysis I
[3 credit hours]
The real number system; continuity and differentiability of functions; convergence of sequences and series; applications.
Term Offered: Fall

MATH 5830 Introduction To Real Analysis II
[3 credit hours]
Riemann Integral; limits of functions; elementary metric space theory including compactness, connectedness and completeness. Optional topics include differentiable functions on Rn; the Implicit and Inverse Function Theorems.
Prerequisites: MATH 5820 with a minimum grade of D-
Term Offered: Spring

MATH 5860 Calculus Of Variations And Optimal Control Theory I
[3 credit hours]
Conditions for an extreme (Euler's equations, Erdman corner conditions, conditions of Legendre, Jacobi and Weierstrass, fields of extremals, Hilbert's invariant integral);); Raleigh-Ritz method; isoperimetric problems; Lagrange, Mayer-Bolza problems. Recommended: MATH 5820.
Prerequisites: MATH 1890 with a minimum grade of D-
Term Offered: Fall

MATH 5880 Complex Variables
[3 credit hours]
Analytic functions; Cauchy's theorem; Taylor and Laurent series; residues; contour integrals; conformal mappings, analytic continuation and applications.
Term Offered: Spring, Summer

MATH 5970 Industrial Math Practicum
[1 credit hour]
Students must submit for approval by their adviser a report on the solution of a practical problem involving mathematics. The problem must be drawn from a company, university department of government unit.

MATH 5980 Topics In Mathematics
[3 credit hours]
Special topics in mathematics.
Term Offered: Spring, Summer, Fall

MATH 6300 Algebra I
[3 credit hours]
Group actions, Sylow's theorems, permutation groups, nilpotent and solvable groups, abelian groups, rings, unique factorization domains, fields.
Prerequisites: MATH 5340 with a minimum grade of D-
Term Offered: Fall

MATH 6310 Algebra II
[3 credit hours]
Field extensions, Galois theory, modules, Noetherian and Artinian rings, tensor products, primitive rings, semisimple rings and modules, the Wedderburn-Artin theorem.
Prerequisites: MATH 6300 with a minimum grade of D-
Term Offered: Spring

MATH 6400 Topology I
[3 credit hours]
Topological spaces, continuous functions, compactness, product spaces, Tychonov's theorem, quotient spaces, local compactness, homotopy theory, the fundamental group, covering spaces.
Prerequisites: MATH 4450 with a minimum grade of D- or MATH 5450 with a minimum grade of D- or MATH 7450 with a minimum grade of D-
Term Offered: Fall

MATH 6410 Topology II
[3 credit hours]
Homology theory, excision, homological algebra, the Brouwer fixed point theorem, cohomology, differential manifolds, orientation, tangent bundles, Sard's theorem, degree theory.
Prerequisites: MATH 6400 with a minimum grade of D-
Term Offered: Spring

MATH 6440 Differential Geometry I
[3 credit hours]
Introduction to differential geometry. Topics include differentiable manifolds, vector fields, tensor bundles, the Frobenius theorem, Stokes' theorem, Lie groups.
Prerequisites: MATH 6410 with a minimum grade of D-
Term Offered: Fall

MATH 6450 Differential Geometry II
[3 credit hours]
Topics include connections on manifolds, Riemannian geometry, the Gauss-Bonnet theorem. Further topics may include: homogeneous and symmetric spaces, minimal surfaces, Morse theory, comparison theory, vector and principal bundles.
Prerequisites: MATH 6440 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 6500 Ordinary Differential Equations
[3 credit hours]
Existence, uniqueness and dependence on initial conditions and parameter, nonlinear planar systems, linear systems, Floquet theory, second order equations, Sturm-Liouville theory.
Term Offered: Summer, Fall

MATH 6510 Partial Differential Equations
[3 credit hours]
First order quasi-linear systems of partial differential equations, boundary value problems for the heat and wave equation, Dirichlet problem for Laplace equation, fundamental solutions for Laplace, heat and wave equations.
Term Offered: Spring, Summer

MATH 6520 Dynamical Systems I
[3 credit hours]
Topic include the flow-box theorem, Poincare maps, attractors, w limit sets, Lyapunov stability, invariant submanifolds, Hamiltonian systems and symplectic manifolds.
Prerequisites: MATH 6500 with a minimum grade of D-

MATH 6530 Dynamical Systems II
[3 credit hours]
Topics may include local bifurcations of vector fields, global stability, ergodic theorems, integrable systems, symbolic dynamics, chaos theory.
Prerequisites: MATH 6520 with a minimum grade of D-

MATH 6600 Statistical Consulting
[1-5 credit hours]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience. May be repeated for credit.
Term Offered: Spring, Summer, Fall

MATH 6610 Statistical Consulting II
[3 credit hours]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience.
Term Offered: Spring

MATH 6620 Categorical Data Analysis
[3 credit hours]
Important methods and modeling techniques using generalized linear models and emphasizing loglinear and logit modeling.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 6630 Nonparametric Statistics
[3 credit hours]
Statistical methods based on counts and ranks; methods designed to be effective in the presence of contaminated data or error distribution misspecification.
Prerequisites: MATH 5680 with a minimum grade of C-
Term Offered: Spring, Fall

MATH 6640 Topics In Statistics
[3 credit hours]
Topics selected from an array of modern statistical methods such as survival analysis, nonlinear regression, Monte Carlo methods, etc.
Term Offered: Spring, Fall

MATH 6650 Statistical Inference
[3 credit hours]
Estimation, hypothesis testing, prediction, sufficient statistics, theory of estimation and hypothesis testing, simultaneous inference, decision theoretic models.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Fall

MATH 6670 Measure Theoretic Probability
[3 credit hours]
Real analysis, probability spaces and measures, random variables and distribution functions, independence, expectation, law of large numbers, central limit theorem, zero-one laws, characteristic functions, conditional expectations given a s-algebra, martingales.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Fall

MATH 6680 Theory Of Statistics
[3 credit hours]
Exponential families, sufficiency, completeness, optimality, equivariance, efficiency. Bayesian and minimax estimation. Unbiased and invariant tests, uniformly most powerful tests. Asymptotic properties for estimation and testing. Most accurate confidence intervals.
Prerequisites: MATH 5960 with a minimum grade of D- or (MATH 6650 with a minimum grade of D- and MATH 6670 with a minimum grade of D-)
Term Offered: Spring

MATH 6690 Multivariate Statistics
[3 credit hours]
Multivariate normal sampling distributions, T tests and MANOVA, tests on covariance matrices, simultaneous inference, discriminant analysis, principal components, cluster analysis and factor analysis.
Prerequisites: MATH 5690 with a minimum grade of D- or MATH 6650 with a minimum grade of D-
Term Offered: Spring

MATH 6730 Methods Of Mathematical Physics II
[3 credit hours]
Self-adjoint operators, special functions, orthogonal polynomials, partial differential equations and separation of variables, boundary value problems, Green¿s functions, integral equations, tensor analysis, metrics and curvature, calculus of variations, finite groups and group representations.
Prerequisites: MATH 6720 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 6800 Real Analysis I
[3 credit hours]
Completeness, connectedness and compactness in metric spaces, continuity and convergence, the Stone-Weierstrass Theorem, Lebesgue measure and integration on the real line, convergence theorems, Egorov's and Lusin's theorems, derivatives, functions of bounded variation.
Prerequisites: MATH 4830 with a minimum grade of D- or MATH 5830 with a minimum grade of D-
Term Offered: Fall

MATH 6810 Real Analysis II
[3 credit hours]
The Vitali covering theorem, absolutely continuous functions, Lebesgue-Stieltjes integration, the Riesz representation theorem , Banach spaces, Lp-spaces, abstract measures, the Radon-Nikodym theorem, measures on locally compact Hausdorff spaces.
Prerequisites: MATH 6800 with a minimum grade of D-
Term Offered: Spring

MATH 6820 Functional Analysis I
[3 credit hours]
Topics include Topological vector spaces, Banach spaces, convexity, the Hahn-Banch theorem, weak and strong topologies, Lp spaces and duality.
Prerequisites: MATH 6810 with a minimum grade of D-
Term Offered: Fall

MATH 6830 Functional Analysis II
[3 credit hours]
Topics include the Mackey-Ahrens Theorem, Banach algebras, spectra in Banach algebras, commutative Banach algebras, unbounded operators, the spectral theorem, topics in functional analysis.
Prerequisites: MATH 6820 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 6840 Complex Analysis I
[3 credit hours]
Elementary analytic functions, complex integration, the residue theorem, infinite sequences of analytic functions, Laurent expansions, entire functions.
Prerequisites: MATH 6800 with a minimum grade of D-
Term Offered: Fall

MATH 6850 Complex Analysis II
[3 credit hours]
Meromorphic functions, conformal mapping, harmonic functions and the dirichlet problem, the Riemann mapping theorem, monodromy, algebraic functions, Riemann surfaces, elliptic functions and the modular function.
Prerequisites: MATH 6840 with a minimum grade of D-
Term Offered: Spring

MATH 6870 Nonlinear Analysis I
[3 credit hours]
The instructor will select a subset among the following topics: Finite-dimensional degree theory, some applications to nonlinear equations. Preliminaries on Operator Theory and Differential Calculus in Normed Spaces; Topological Degree in Banach Spaces (Schuder fixed point theorem and Leray-Schauder theory) , non-resonance and topological degree, Lazer-Leach conditions and variations, variational techniques including Ekeland principle and its applications and Mountain Pass theorem, resonance and periodic solutions, Lusternik-Schnirelmann Theory, Poincare'-Birkhoff Theorem. Bifurcation theory: Morse lemma and its applications. Rabinowitz theorem and Krasnoselski theorem and its applications. Stability of solutions and number of global solutions to a nonlinear problem.
Prerequisites: MATH 6500 with a minimum grade of D- and MATH 6510 with a minimum grade of D-
Term Offered: Fall

MATH 6880 Nonlinear Analysis II
[3 credit hours]
The instructor will select a subset among the following topics: Geometric singular perturbation theory. Further topological methods: extensions of Leray-Schauder degree and applications to partial differential equations. Framed cobordism and stable cohomotopy theorem. Applications to existence of global solutions. Monotone operators and mini-max theorem. Generalized implicit function theorems, KAM and Conjugacy problems. Critical Points Theory and Hamiltonian Systems Topological Degree methods in Nonlinear Boundary Value Problems Normal forms, center manifold reduction and bifurcations in infinite dimensional dynamical systems.
Prerequisites: MATH 6500 with a minimum grade of D- and MATH 6510 with a minimum grade of D- and MATH 6870 with a minimum grade of D-
Term Offered: Spring

MATH 6930 Colloquium
[1 credit hour]
Lectures by visiting mathematicians and staff members on areas of current interest in mathematics.
Term Offered: Spring, Fall

MATH 6940 Proseminar
[1-5 credit hours]
Problems and techniques of teaching elementary college mathematics, supervised teaching, seminar in preparation methods.
Term Offered: Spring, Fall

MATH 6980 Topics In Mathematical Sciences
[3 credit hours]
Special topics in Mathematics or Statistics.
Term Offered: Spring, Summer, Fall

MATH 6990 Readings In Mathematics
[1-5 credit hours]
Readings in areas of Mathematics of mutual interest to the student and the professor.
Term Offered: Spring, Summer, Fall

MATH 7330 Abstract Algebra I
[3 credit hours]
Arithmetic of the integers, unique factorization and modular arithmetic; group theory including normal subgroups, factor groups, cyclic groups, permutations, homomorphisms, the isomorphism theorems, abelian groups and p-groups.
Term Offered: Fall

MATH 7340 Abstract Algebra II
[3 credit hours]
Ring theory including integral domains, field of quotients, homomorphisms, ideals, Euclidean domains, polynomial rings, vector spaces, roots of polynomials and field extensions.
Prerequisites: MATH 5330 with a minimum grade of D-
Term Offered: Spring

MATH 7350 Applied Linear Algebra
[3 credit hours]
Matrices, systems of equations, vector spaces, linear transformations, determinants, eigenvalues and eigenvectors, generalized inverses, rank, numerical methods and applications to various areas of science.
Term Offered: Spring, Summer

MATH 7450 Introduction To Topology I
[3 credit hours]
Metric spaces, topological spaces, continuous maps, bases and sub-bases, closure and interior operators, products, subspaces, sums, quotients, separation axioms, compactness and local compactness.
Term Offered: Fall

MATH 7460 Introduction To Topology II
[3 credit hours]
Connectedness and local connectedness, convergence, metrization, function spaces. The fundamental groups and its properties, covering spaces, classical applications, e.g. Jordan Curve Theorem, Fundamental Theorem of Algebra, Brouwer's Fixed Point Theorem.
Prerequisites: MATH 5450 with a minimum grade of D-
Term Offered: Spring

MATH 7540 Classical Differential Geometry I
[3 credit hours]
Smooth curves in Euclidean space including the Frenet formulae. Immersed surfaces with the Gauss map, principal curvatures and the fundamental forms. Special surfaces including ruled surfaces and minimal surfaces. Intrinsic Geometry including the Gauss Theorem Egregium.

MATH 7550 Classical Differential Geometry II
[3 credit hours]
Tensors, vector fields and the Cartan approach to surface theory, Bonnet's Theorem and the construction of surfaces via solutions of the Gauss Equation. Geodesics, parallel transport and Jacobi Fields. Theorems of a global nature such as Hilbert's Theorem or the Theorem of Hopf-Rinow.
Prerequisites: MATH 5540 with a minimum grade of D-

MATH 7600 Advanced Statistical Methods I
[3 credit hours]
Basics of descriptive statistics, study designs and statistical inference. Properties of, and assumptions required for, inference for means, variances, and proportions from one and two-sample paired and unpaired studies. Introduction to ANOVA with multiple comparisons and logistic and multiple regression. Model assessment and diagnostics. Statistical software will be employed. Opportunities to apply procedures to real data. Emphasis placed on the foundations to approaches in introductory statistics.
Term Offered: Fall

MATH 7610 Advanced Statistical Methods II
[3 credit hours]
Statistical/biostatistical concepts and methods. Broad subject categories that may be included are study design, longitudinal data analysis, survival analysis, logistic regression, random and mixed effects models and Bayesian Statistics. Other topics applicable to current statistical consulting projects, or related to modern data analytics, may be introduced. Appropriate statistical software will be employed.
Prerequisites: MATH 5600 with a minimum grade of C-
Term Offered: Spring

MATH 7620 Linear Statistical Models
[3 credit hours]
Multiple regression, analysis of variance and covariance, general linear models and model building for linear models. Experimental designs include one-way, randomized block, Latin square, factorial and nested designs.
Prerequisites: MATH 6650 with a minimum grade of D-
Term Offered: Spring

MATH 7630 Theory And Methods Of Sample Surveys
[3 credit hours]
The mathematical basis to estimation in various sampling contexts, including probability proportional to size sampling, stratified sampling, two-stage cluster sampling and double sampling, is developed.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Spring

MATH 7640 Statistical Computing
[3 credit hours]
Modern statistical computing, including programming tools, modern programming methodologies, design of data structures and algorithms, numerical computing and graphics. Additional topics selected from simulation studies, inversion of probability integral transforms, rejection sampling, importance sampling, Monte Carlo integration, bootstrapping and optimization.
Term Offered: Fall

MATH 7680 Introduction To Theory Of Probability
[3 credit hours]
Probability spaces, random variables, probability distributions, moments and moment generating functions, limit theorems, transformations and sampling distributions.
Prerequisites: MATH 3190 with a minimum grade of D-
Term Offered: Fall

MATH 7690 Introduction To Mathematical Statistics
[3 credit hours]
Sampling distributions, point estimation, interval estimation, hypothesis testing, regression and analysis of variance.
Prerequisites: MATH 5680 with a minimum grade of D-
Term Offered: Spring

MATH 7710 Methods Of Numerical Analysis I
[3 credit hours]
Floating point arithmetic; polynomial interpolation; numerical solution of nonlinear equations; Newton's method. Likely topics include: numerical differentiation and integration; solving systems of linear equations; Gaussian elimination; LU decomposition; Gauss-Seidel method.
Term Offered: Fall

MATH 7720 Methods Of Numerical Analysis II
[3 credit hours]
Likely topics include: Computation of eigenvalues and eigenvectors; solving systems of nonlinear equations; least squares approximations; rational approximations; cubic splines; fast Fourier transforms; numerical solutions to initial value problems; ordinary and partial differential equations.
Prerequisites: MATH 5710 with a minimum grade of D-
Term Offered: Spring

MATH 7800 Ordinary Differential Equations
[3 credit hours]
Modern theory of differential equations; transforms and matrix methods; existence theorems and series solutions; and other selected topics.
Term Offered: Spring, Fall

MATH 7810 Partial Differential Equations
[3 credit hours]
First and second order equations; numerical methods; separation of variables; solutions of heat and wave equations using eigenfunction techniques; and other selected topics.
Term Offered: Spring

MATH 7820 Introduction To Real Analysis I
[3 credit hours]
The real number system; continuity and differentiability of functions; convergence of sequences and series; applications.
Term Offered: Fall

MATH 7830 Introduction To Real Analysis II
[3 credit hours]
Riemann Integral; limits of functions; elementary metric space theory including compactness, connectedness and completeness. Optional topics include differentiable functions on Rn; the Implicit and Inverse Function Theorems.
Prerequisites: MATH 5820 with a minimum grade of D-
Term Offered: Spring

MATH 7880 Complex Variables
[3 credit hours]
Analytic functions; Cauchy's theorem; Taylor and Laurent series; residues; contour integrals; conformal mappings, analytic continuation and applications.
Term Offered: Spring, Summer

MATH 7980 Topics In Mathematics
[3 credit hours]
Special topics in mathematics.

MATH 8300 Algebra I
[3 credit hours]
Group actions, Sylow's theorems, permutation groups, nelpotent and solvable groups, abelian groups, rings, unique factorization domains, fields.
Prerequisites: MATH 5340 with a minimum grade of D- or MATH 7340 with a minimum grade of D-
Term Offered: Fall

MATH 8310 Algebra II
[3 credit hours]
Field extensions, Galois theory, modules, Noetherian and Artinian rings, tensor products, primitive rings, semisimple rings, and modules, the Wedderburn-Artin theorem.
Prerequisites: MATH 6300 with a minimum grade of D- or MATH 8300 with a minimum grade of D-
Term Offered: Spring

MATH 8400 Topology I
[3 credit hours]
Topological spaces, continuous functions, compactness, product spaces, Tychonov's theorem, quotient spaces, local compactness, homotopy theory, the fundamental group, covering spaces.
Prerequisites: MATH 7450 with a minimum grade of D- or MATH 4450 with a minimum grade of D- or MATH 5450 with a minimum grade of D-
Term Offered: Fall

MATH 8410 Topology II
[3 credit hours]
Homology theory, excision, homological algebra, the Brouwer fixed point theorem, cohomology, differential manifolds, orientation, tangent bundles, Sard' theorem, degree theory.
Prerequisites: MATH 6400 with a minimum grade of D- or MATH 8400 with a minimum grade of D-
Term Offered: Spring

MATH 8440 Differential Geometry I
[3 credit hours]
Introduction to differential geometry. Topics include differentiable manifolds, vector fields, tensor bundles, the Frobenius theorem, Stokes' theorem, Lie groups.
Prerequisites: MATH 6410 with a minimum grade of D- or MATH 8410 with a minimum grade of D-
Term Offered: Fall

MATH 8450 Differential Geometry II
[3 credit hours]
Topics include connections on manifolds, Riemannian geometry, the Gauss-Bonnet theorem. Further topics may include: homogeneous and symmetric spaces, minimal surfaces, Morse theory, comparison theory, vector and principal bundles.
Prerequisites: MATH 6440 with a minimum grade of D- or MATH 8440 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 8500 Ordinary Differential Equations
[3 credit hours]
Existence, uniqueness and dependence on initial conditions and parameter, nonlinear planar systems, linear systems, Floquet theory, second order equations, Sturm-Liouville theory.
Term Offered: Summer, Fall

MATH 8510 Partial Differential Equations
[3 credit hours]
First order quasi-linear systems of partial differential equations, boundary value problems for the heat and wave equation, Dirichlet problem for Laplace equation, fundamental solutions for Laplace, heat and wave equations.
Term Offered: Spring

MATH 8520 Dynamical Systems I
[3 credit hours]
Topic include the flow-box theorem, Poincare maps, attractors, w-limit sets, Lyapunov stability, invariant submanifolds, Hamiltonian systems and symplectic manifolds.
Prerequisites: MATH 6500 with a minimum grade of D- or MATH 8500 with a minimum grade of D-

MATH 8530 Dynamical Systems II
[3 credit hours]
Topics may include local bifurcations of vector fields, global stability, ergodic theorems, integrable systems, symbolic dynamics, chaos theory.
Prerequisites: MATH 6520 with a minimum grade of D- or MATH 8520 with a minimum grade of D-

MATH 8540 Partial Differential Equations I
[3 credit hours]
Possible topics may include: the Cauchy-Kovalevskaya Theorem, nonlinear partial differential equations of the first order, theory of Sobolev spaces, linear second order PDE's of elliptic, hyperbolic and parabolic type.
Prerequisites: MATH 6510 with a minimum grade of D- or MATH 8510 with a minimum grade of D-
Term Offered: Fall

MATH 8550 Partial Differential Equations II
[3 credit hours]
Selected topics in Partial Differential Equations of current interest emphasizing nonlinear theory. Possible topics may include: Minimal surfaces, applications of the Hopf maximum principle, free boundary value problems, harmonic maps, geometric evolution equations and the Navier-Stokes equation.
Prerequisites: MATH 6540 with a minimum grade of D- or MATH 8540 with a minimum grade of D-
Term Offered: Spring

MATH 8600 Statistical Consulting
[1-5 credit hours]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience. May be repeated for credit.
Term Offered: Spring, Summer, Fall

MATH 8610 Statistical Consulting II
[2 credit hours]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience.
Term Offered: Spring

MATH 8620 Categorical Data Analysis
[3 credit hours]
Important methods and modeling techniques using generalized linear models and emphasizing loglinear and logit modeling.
Prerequisites: MATH 5680 with a minimum grade of D- or MATH 7680 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 8630 Nonparametric Statistics
[3 credit hours]
Statistical methods based on counts and ranks; methods designed to be effective in the presence of contaminated data or error distribution misspecification.
Prerequisites: MATH 5680 with a minimum grade of C- or MATH 7680 with a minimum grade of C-
Term Offered: Spring, Fall

MATH 8640 Topics In Statistics
[3 credit hours]
Topics selected from an array of modern statistical methods such as survival analysis, nonlinear regression, Monte Carlo methods, etc.
Term Offered: Spring, Fall

MATH 8650 Statistical Inference
[3 credit hours]
Estimation, hypothesis testing, prediction, sufficient statistics, theory of estimation and hypothesis testing, simultaneous inference, decision theoretic models.
Prerequisites: MATH 5680 with a minimum grade of D- or MATH 7680 with a minimum grade of D-
Term Offered: Fall

MATH 8670 Measure Theoretic Probability
[3 credit hours]
Real analysis, probability spaces and measures, random variables and distribution functions, independence, expectation, law of large numbers, central limit theorem, zero-one laws, characteristic functions, conditional expectations given a s-algebra, martingales.
Prerequisites: MATH 5680 with a minimum grade of D- or MATH 7680 with a minimum grade of D-
Term Offered: Fall

MATH 8680 Theory Of Statistics
[3 credit hours]
Exponential families, sufficiency, completeness, optimality, equivariance, efficiency. Bayesian and minimax estimation. Unbiased and invariant tests, uniformly most powerful tests. Asymptotic properties for estimation and testing. Most accurate confidence intervals.
Term Offered: Spring

MATH 8690 Multivariate Statistics
[3 credit hours]
Multivariate normal sampling distributions, T tests and MANOVA, tests on covariance matrices, simultaneous inference, discriminant analysis, principal components, cluster analysis and factor analysis.
Prerequisites: MATH 5690 with a minimum grade of D- or MATH 6650 with a minimum grade of D- or MATH 8650 with a minimum grade of D-
Term Offered: Spring

MATH 8730 Methods Of Mathematical Physics II
[3 credit hours]
Self-adjoint operators, special functions, orthogonal polynomials, partial differential equations and separation of variables, boundary value problems, Green¿s functions, integral equations, tensor analysis, metrics and curvature, calculus of variations, finite groups and group representations.
Prerequisites: MATH 6720 with a minimum grade of D- or MATH 8720 with a minimum grade of D-

MATH 8800 Real Analysis I
[3 credit hours]
Completeness, connectedness and compactness in metric spaces, continuity and convergence, Stone-Weierstrass Theorem, Lebesgue measure and integration on the real line, convergence theorems, Egorov's and Lusin's theorems, derivatives, functions of bounded variation.
Prerequisites: MATH 7830 with a minimum grade of D- or MATH 4830 with a minimum grade of D- or MATH 5830 with a minimum grade of D-
Term Offered: Fall

MATH 8810 Real Analysis II
[3 credit hours]
The Vitali covering theorem, absolutely continuous functions, Lebesgue-Stieltjes integration, the Reisz representation theorem, Banach spaces, Lp-spaces, abstract measures, the Radon-Nikodym theorem, measures on locally compact Hausdorff spaces.
Prerequisites: MATH 6800 with a minimum grade of D- or MATH 8800 with a minimum grade of D-
Term Offered: Spring

MATH 8820 Functional Analysis I
[3 credit hours]
Topics include Topological vector spaces, Banach spaces, convexity, the Hahn-Banach theorem, weak and strong topologies, Lp spaces and duality.
Prerequisites: MATH 6810 with a minimum grade of D- or MATH 8810 with a minimum grade of D-
Term Offered: Fall

MATH 8830 Functional Analysis II
[3 credit hours]
Topics include the Mackey-Ahrens Theorem, Banach algebras, spectra in Banach algebras, commutative Banach algebras, unbounded operators, the spectral theorem, topics in functional analysis.
Prerequisites: MATH 6820 with a minimum grade of D- or MATH 8820 with a minimum grade of D-
Term Offered: Spring, Fall

MATH 8840 Complex Analysis I
[3 credit hours]
Elementary analytic functions, complex integration, the residue theorem, infinite sequences of analytic functions, Laurent expansions, entire functions.
Prerequisites: MATH 6800 with a minimum grade of D- or MATH 8800 with a minimum grade of D-
Term Offered: Fall

MATH 8850 Complex Analysis II
[3 credit hours]
Meromorphic functions, conformal mapping, harmonic functions and the Dirichlet problem, the Riemann mapping theorem, monodromy, algebraic functions, Riemann surfaces, elliptic functions and the modular function.
Prerequisites: MATH 6840 with a minimum grade of D- or MATH 8840 with a minimum grade of D-
Term Offered: Spring

MATH 8860 Nonlinear Analysis I
[3 credit hours]
Topological Degree in Banach Spaces (Schuder fixed point theorem and Leray-Schauder theory) , non-resonance and topological degree, Lazer-Leach conditions and variations, variational techniques including Ekeland principle and its applications and Mountain Pass theorem, resonance and periodic solutions, Lusternik-Schnirelmann Theory, Poincare'-Birkhoff Theorem. Bifurcation theory: Morse lemma and its applications. Rabinowitz theorem and Krasnoselski theorem and its applications. Stability of solutions and number of global solutions to a nonlinear problem.
Prerequisites: MATH 8500 with a minimum grade of D- and MATH 8510 with a minimum grade of D-
Term Offered: Fall

MATH 8880 Nonlinear Analysis II
[3 credit hours]
The instructor based in his/her interests and on the interests and needs of the students attending the course will select a subset among the following topics: Geometric singular perturbation theory Further topological methods: extensions of Leray-Schauder degree and applications to partial differential equations. Framed cobordism and stable cohomotopy theorem. Applications to existence of global solutions. Monotone operators and mini-max theorem. Generalized implicit function theorems, KAM and Conjugacy problems. Critical Points Theory and Hamiltonian Systems.
Prerequisites: MATH 8500 with a minimum grade of D- and MATH 8510 with a minimum grade of D- and MATH 8870 with a minimum grade of D-
Term Offered: Spring

MATH 8890 Problems In Algebra, Topology, And Analysis
[1 credit hour]
Practicum in solving problems in graduate algebra, topology and analysis. Supplements 6300-10, 6400-10 and 6800-10 and prepares students for doctoral qualifying examination.

MATH 8930 Colloquium
[1 credit hour]
Lectures by visiting mathematicians and staff members on areas of current interest in mathematics.
Term Offered: Spring, Fall

MATH 8940 Proseminar
[1-5 credit hours]
Problems and techniques of teaching elementary college mathematics, supervised teaching, seminar in preparation methods.
Term Offered: Spring, Summer, Fall

MATH 8960 Dissertation
[1-6 credit hours]
Student works toward their dissertation.
Term Offered: Spring, Summer, Fall

MATH 8980 Topics In Mathematical Sciences
[3 credit hours]
Special topics in Mathematics or Statistics.
Term Offered: Spring, Summer, Fall

MATH 8990 Readings In Mathematics
[1-5 credit hours]
Readings in areas of Mathematics of mutual interest to the student and the professor.
Term Offered: Spring, Summer, Fall

Mechanical Industrial and Manufacturing Engineering (MIME)

MIME 5060 Manufacturing Engineering
[3 credit hours]
The course provides an overview of advanced manufacturing processes, manufacturing management, nano- and bio-manufacturing processes and their applications.
Term Offered: Spring, Fall

MIME 5080 Operations Research I
[3 credit hours]
This course focuses on the mathematical methods of Operations Research and their applications in engineering. Topics include the optimal solution of deterministic and stochastic mathematical models, modeling process, linear programming, the simplex method, duality theory and sensitivity analysis.
Term Offered: Spring, Summer, Fall

MIME 5100 Manufacturing Systems Simulation
[3 credit hours]
Discrete and continuous simulation models are used to study queuing networks, manufacturing and related engineering systems. Simulation languages and animation are covered. Statistical inference is used to draw conclusions and to identify the best system.
Term Offered: Spring, Fall

MIME 5230 Dynamics Of Human Movement
[3 credit hours]
The goal of this course is for students to be able to describe motions of the human body. Three-dimensional analysis and measurements of human body movements including kinematics, kinetics and energetics of human gait, anthropometry and application to bioengineering and orthopedics will be presented. Euler angles and the screw axis method will be used to describe three-dimensional motions.
Term Offered: Spring, Fall

MIME 5240 Experimental Methods in Orthopaedic Biomechanics
[3 credit hours]
Experimental techniques used in orthopedics and in the study of the musculoskeletal system including mechanical testing, experimental and analytical methods for stress analysis, strain gages, methods used in human motion analysis to include motion capture, force plates and EMG's. Course prerequisites: For undergraduate students: (BIOE 2200 or MIME 1650) and (BIOE 3110 or CIVE 1160) For graduate students: None
Prerequisites: (BIOE 2200 with a minimum grade of D- or MIME 1650 with a minimum grade of D-) and (BIOE 3110 with a minimum grade of D- or CIVE 1160 with a minimum grade of D-)
Term Offered: Spring, Fall

MIME 5280 Cad - Finite Element Methods
[3 credit hours]
Numerical solutions of boundary value problems, variational calculus and the principle of minimum potential energy, finite element formulation of two dimensional field and elasticity problems, axisymmetric elements, finite element programming.
Term Offered: Summer, Fall

MIME 5300 Advanced Mechanics Of Materials
[3 credit hours]
Theory of elasticity, plane stress and plane strain problems, yield criteria and failure theories, bending of beams, energy methods, curved flexural members, unsymmetric bending, torsion, shear center and axisymmetrically loaded members.
Term Offered: Spring, Fall

MIME 5310 Mechanics Of Composite Materials
[3 credit hours]
Review of elasticity of anisotropic solids, determination of mechanical properties of fiber-reinforced lamina, analysis and performance of laminated composites.
Term Offered: Spring

MIME 5320 Fatigue Of Materials & Structures
[3 credit hours]
Fatigue design methods; fatigue fracture mechanisms; cyclic deformation behavior and material cyclic properties; stress-based, and fracture mechanics-based methodologies to fatigue life prediction of smooth and notched members subjected to constant or variable amplitude loadings.
Prerequisites: CIVE 1160 with a minimum grade of D-
Term Offered: Spring, Fall

MIME 5350 Advanced Ceramics
[3 credit hours]
This course provides greater knowledge on the atomic bonding, crystal structure, crystal imperfections, phases and interfaces, microstructures, phase diagrams, phase transformation, transport and diffusion, metal deformation, fracture of materials, deterioration of materials, electronic and physical properties of ceramics.
Prerequisites: MIME 1650 with a minimum grade of C- and PHYS 2130 with a minimum grade of C-
Term Offered: Spring, Fall

MIME 5370 Advanced Materials for Automotive Structures
[3 credit hours]
An in#depth study of the broad range of engineering materials used in the construction of motor vehicles. Inter#relations between materials microstructure, components manufacturing process and components service behavior.
Prerequisites: (MIME 1650 with a minimum grade of C- and PHYS 2130 with a minimum grade of C-)
Term Offered: Spring, Fall

MIME 5380 Engineering Polymers and Rubbers
[3 credit hours]
Polymers and rubber are introduced through lecture and lab components at three levels- 1) synthesis and characterization, 2) thermal, molecular and mechanical properties, and 3) design considerations for engineering applications.
Prerequisites: (MIME 1650 with a minimum grade of C- and PHYS 2130 with a minimum grade of C-)
Term Offered: Spring, Fall

MIME 5390 Failure Analysis of Materials
[3 credit hours]
The failure analysis is a procedure to determine the physical cause of the failure of an element, component or industrial equipment. The course will be focused on material related and will present an introduction to the principles of failure analysis and the fundamental aspects to conduct a failure analysis investigation. A key component of the course is the discussion of real cases of failures (case studies), i.e. failures in mining machinery, chemical processing equipment, energy production, systems, aircraft and petrochemical industry components. This course provides the connection between mechanisms that are responsible for material failures and will address the characterization techniques used in failure analysis. Fundamental failure mechanisms in various materials applications including fracture of metals and alloys, failure in electronic devices, and environmental factor induced failures will be covered. Each categorized phenomenon will be approached by historical events to reveal the application and connection between the mechanism and the incidents.
Prerequisites: (MIME 1650 with a minimum grade of C- and PHYS 2130 with a minimum grade of C-)
Term Offered: Spring, Fall

MIME 5410 Alternative Energy
[3 credit hours]
This course focuses on the technical aspects of sustainable energy technologies, such as wind, solar, biomass, ocean waves/tides, geothermal, and hydropower; it also covers issues and applications related to storage, transportation, distribution, industrial usage, and buildings. The course investigates the progress, challenges, and opportunities of each technology to be both technically feasible and economically viable.
Term Offered: Spring, Fall

MIME 5420 Modeling and Control of Engineering Systems
[3 credit hours]
In this course students study physical modeling and feedback principles for control of mechanical and electrical systems. Transient response, root locus and frequency response principles are applied to the control of basic mechanical and electrical systems. PID control laws are emphasized.
Term Offered: Spring, Fall

MIME 5430 Advanced Automotive Control Systems
[3 credit hours]
This course covers the major aspects of automotive control, including engine, driveline, and complete vehicle control. This includes applications such as fuel and ignition control, ABS systems, gear-shifting, and vehicle velocity estimation.
Term Offered: Spring, Summer, Fall

MIME 5440 Advanced Mechatronics
[3 credit hours]
This course will give students hands-on experience with mechatronic systems and components. The mechatronics lab (NE-1063) will be used to demonstrate several mechatronics systems including inverted pendulums, suites of sensors and motors, and other more complex systems. A major part of the course will be a semester-long project where the students conceive, design, and build a mechatronic device. The components for this device, namely a Raspberry Pi and a variety of sensors and actuators, will be directly funded by the course fee.
Term Offered: Spring, Fall

MIME 5450 Advanced Automation Design
[3 credit hours]
This course will introduce the range of common components used in automation, including actuators, sensors, motors, linear guides, energy chain, industrial robots and light curtains. Students will practice (with feedback) walking through the design process in specifying, sizing, laying out and integrating these components. The course will use some elements of CAD, where CAD experience would be helpful, but this would also be a good opportunity to quickly build competence with CAD.
Term Offered: Spring, Fall

MIME 5460 Advanced MATLAB for Engineers
[3 credit hours]
MATLAB is a useful 'tool' for each engineer to have in their 'toolkit'. This course will review the basics of using MATLAB, identify best-practices (applicable to other programming languages as well), and then move on to examples of more-advanced functionality, e.g. image processing, Simulink control of mechatronic systems, numerically solving differential equations, GPU computation, and optimization. Programming experience would be helpful, but this would also be a good opportunity to rapidly grow programming skills with an easy-to-learn language. A major component of the course is a semester-long project where the student can choose a topic that is most relevant to their research or professional interests, or simply a new area that they're curious about, e.g. mechatronics and programming embedded systems.
Term Offered: Spring, Summer, Fall

MIME 5510 Turbomachinery
[3 credit hours]
Theory of energy transfer between fluid and rotor in turbomachines. Design of turbomachine components, axial flow compressors and fans, centrifugal compressors and pumps, axial flow turbines. Design theory and principles, performance analysis, and computational methods
Term Offered: Spring, Summer, Fall

MIME 5520 Heating, Ventilating & Air Conditioning
[3 credit hours]
Control of the thermal environment within enclosed spaces including psychometric properties of air heating and cooling, loads and factors affecting human comfort. Analysis of basic heating and refrigeration systems, heat pumps, heaters, utilization of solar energy, humidifiers, energy conservation and controls for systems.
Term Offered: Fall

MIME 5530 Internal Combustion Engines
[3 credit hours]
Study of Otto, Diesel, and Miller Cycles, performance characteristics, and construction details of internal combustion engines. Analysis of problems associated with air flow, fuel injection, combustion, cooling, supercharging, friction, lubrication, emissions, testing, and control.
Term Offered: Spring

MIME 5540 Jet Propulsion
[3 credit hours]
Mechanics and thermodynamics of jet propulsion. Fundamentals of high-speed flow. Analysis of gas turbine engine components: diffuser, compressor, turbine and nozzle. Investigation of characteristics of ramjets, turbojets, turbofans and turboprops. Introduction to solid and liquid rockets.
Prerequisites: MIME 3410 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

MIME 5550 Aerodynamics
[3 credit hours]
Fundamentals of aerodynamics, potential flow theory, aerodynamic forces and moments, introduction to numerical analysis, application to external and internal flows, theory of lift for infinite and finite wings, induced drag.
Term Offered: Spring, Fall

MIME 5560 Gas Dynamics
[3 credit hours]
Analysis of compressible flow phenomena including shock and detonation waves. Topics include wave propagation, isentropic flow, normal shock waves, oblique shock waves, Prandtl-Meyer flow, and analysis and application to supersonic airfoil theory, inlet, and nozzle.
Term Offered: Spring

MIME 5690 Reliability
[3 credit hours]
Reliability of components and multicomponent systems. Static and dynamic reliability models for both independent and dependent failures. Effects of redundancy. Reliability testing consideration.
Term Offered: Spring, Summer, Fall

MIME 5820 Sustainability Analysis and Design
[3 credit hours]
The course is intended to introduce students to sustainability analysis and design in manufacturing and service settings as related to mechanical and industrial engineering. It will cover solid waste minimization for manufacturers, life cycle analysis, and environmentally conscious design.
Term Offered: Spring, Fall

MIME 5830 Additive Manufacturing
[3 credit hours]
Additive manufacturing (AM) is a method of manufacturing that has been growing rapidly. In this course the students will learn about various AM technologies. They will also work with the required design software packages to create 3D models and 3D-print objects from the designed models.
Prerequisites: MIME 2650 (may be taken concurrently) with a minimum grade of D-
Term Offered: Spring, Summer, Fall

MIME 5980 Special Topics
[1-6 credit hours]
A special topic at the graduate level in Mechanical, Industrial or Manufacturing Engineering to be offered as a course during a term by a faculty member.
Term Offered: Spring, Summer, Fall

MIME 6000 Advanced Engineering Mathematics I
[3 credit hours]
An advanced course in mathematical analysis for engineers. Topics include matrix methods, eigenvalues and eigenvectors, systems of equations, series representations including FFT, ordinary differential equations and Bessel functions. This course will make use of computer-aided-mathematics techniques and include engineering applications.
Term Offered: Fall

MIME 6100 Advanced Engineering Mathematics II
[3 credit hours]
Partial differential equations for engineering applications including elliptic, parabolic, hyperbolic differential and non-linear systems of equations. Solution procedures include separation of variables, Laplace transform methods, solutions using complex analysis including conformal mapping and numerical methods.
Prerequisites: MIME 6000 with a minimum grade of D-
Term Offered: Spring

MIME 6200 Advanced Dynamics
[3 credit hours]
Study of dynamics of a system of particles and rigid bodies using Newtonian and Lagrangian Mechanics including multi-body systems. Principles of nonlinear system dynamics and stability.
Term Offered: Spring

MIME 6300 Continuum Mechanics
[3 credit hours]
A unified approach to the study of the mechanics of continuous media; analysis of tensors; kinematics of material media; analysis of deformation and stress; the mathematical statement of the laws of conservation of mass, momentum and energy; formulation of the mechanical constitutive equations for various classes of solids and fluids.
Term Offered: Spring, Fall

MIME 6350 Elasticity
[3 credit hours]
Review of tensor analysis, analysis of stress and strain, three dimensional equations of elasticity, plane problems in rectangular Cartesian and polar coordinates.
Term Offered: Fall

MIME 6360 Plasticity
[3 credit hours]
Review of elastic stress-strain relations, analysis of strain rate and concept of stress rate, criteria of yielding and rules of plastic flow, elastoplastic bending and torsion, theory of slipline fields, mechanics of metal forming processes.
Term Offered: Spring

MIME 6380 Fracture Mechanics
[3 credit hours]
Principles of fracture mechanics and its applications to the prevention of fractures in components and structures, linear elastic and elastic-plastic fracture mechanics, fracture mechanisms, fracture toughness, applications to fatigue crack propagation.
Term Offered: Fall

MIME 6440 Computational Fluid Dynamics I
[3 credit hours]
Properties of various partial differential equations. Basics of finite difference methods. Governing equations of fluid mechanics and heat transfer. Numerical solution of inviscid flow equations. Methods for solving Euler equations. Treatment of shock waves. Applications to simple compressible flows. Numerical methods for boundary-layer type equations.
Term Offered: Fall

MIME 6450 Experimental Fluid Mechanics
[3 credit hours]
Digital data acquisition and analysis; limitations and interpretation of physical measurements; sources of errors and difficulties in experimental technique; advanced experimental methods for static and dynamic measurements in thermal systems and fluid flow.
Term Offered: Spring

MIME 6460 Intermediate Fluid Mechanics and Heat Transfer
[3 credit hours]
Development of the Navier-Stokes and the convective equations. Analysis of boundary-layer flows including similarity solutions, potential flows as well as convective heat transfer topics. This course is intended to provide a solid theoretical foundation in fluid mechanics and convective heat transfer for graduate students, preparing them for more specialized courses in Heath Transfer and Fluid Mechanics.
Term Offered: Spring, Fall

MIME 6470 Advanced Computational Fluid Dynamics
[3 credit hours]
This course presents numerical methods to solve hyperbolic equations for compressible fluids. The eigensystem and characteristics of the system of equations representing one-dimensional Euler flows are detailed in terms of conservative and primitive variables. The focus of this course is to introduce concepts of finite-volume upwinding schemes and numerical flux formulations. Numerical solution methods using both explicit and implicit schemes will be introduced in the class and be selectively exercised in the CFD coding project.
Prerequisites: MIME 3430 with a minimum grade of D- and MIME 3400 with a minimum grade of D-
Term Offered: Spring, Fall

MIME 6540 Computational Fluid Dynamics II
[3 credit hours]
Finite difference procedures applied to the solution of reduced forms of the Navier-Stokes equations. Numerical solution of compressible and incompressible forms of the Navier-Stokes equations for laminar and turbulent flows. Fundamental turbulence models. Solution enhancement methods including multi-grid schemes and the use of preconditioning. Grid generation procedures using algebraic and differential equation methods. Structured versus unstructured grid methods. Grid adaptation procedures. Computer program applications.
Prerequisites: MIME 6440 with a minimum grade of D-
Term Offered: Spring

MIME 6550 Turbulent Flow
[3 credit hours]
Study of the nature, origin and dynamics of turbulence. Governing equations of turbulent flows. Internal and external flows. Aspects of free shear flow, turbulent boundary layers and statistical descriptions are presented. Numerical and experimental methods applied to turbulent flow.
Term Offered: Spring, Fall

MIME 6570 Advanced Fluid Mechanics
[3 credit hours]
Review of general governing equations, stability of laminar flows, transition to turbulence, incompressible turbulent flows, compressible boundary layer flow, and a selected topic chosen with the class.
Prerequisites: MIME 6460 with a minimum grade of D-
Term Offered: Spring

MIME 6580 Advanced Heat Transfer
[3 credit hours]
Analytical and numerical methods for steady and transient heat conduction, convective heat transfer in boundary layers, models for external and internal forced flows, free flows, influence of turbulence, and phase change.
Prerequisites: MIME 6460 with a minimum grade of D-
Term Offered: Spring, Fall

MIME 6590 Advanced Gas Dynamics
[3 credit hours]
One-dimensional steady flows of prefect gases: fundamental laws and basic equations for subsonic, transonic, and supersonic processes. Multidimensional flows: exact solutions; linearized flows; characteristics; supersonic nozzle design. Unsteady one-dimensional flows with discontinuities. Measurements in compressible flows. A selected topics in viscous, heat conducting compressible flows and boundary layers.
Prerequisites: MIME 4560 with a minimum grade of D-
Term Offered: Spring

MIME 6650 Advanced Material Science and Engineering
[3 credit hours]
The course provides an overview of structure, properties, design considerations, processing and engineering application of engineering materials. Hard and Soft materials are introduced through lecture and demonstrations at three levels- 1) synthesis and characterization, 2) thermal, molecular and mechanical properties, and 3) design considerations for engineering applications.
Term Offered: Spring, Summer, Fall

MIME 6720 Design of Experiments
[3 credit hours]
Design and analysis of experiments including analysis of variance and regression analysis. Factorial, blocked and nested models are considered together with appropriate estimation and post ANOVA tests.
Term Offered: Fall

MIME 6810 Assembly And Joining Processes
[3 credit hours]
This course is comprised of two parts: joining processes and assembly systems. Commonly used joining methods, such as welding, mechanical fastening and adhesion are discussed. General principles of assembly are presented with extensive use of automobile assembly as an example.
Term Offered: Spring

MIME 6900 Independent Research
[1-16 credit hours]
Research credit hours toward the Master of Science degree in Mechanical, Industrial and Manufacturing Engineering Department. Students are to use the section number of their thesis/dissertation adviser.
Term Offered: Spring, Summer, Fall

MIME 6920 Special Projects
[1-6 credit hours]
A special project by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students interested in mechanical, industrial or manufacturing engineering.
Term Offered: Spring, Summer, Fall

MIME 6930 Graduate Seminar
[0 credit hours]
This is a seminar for graduate students in Mechanical, Industrial and Manufacturing Engineering. Topics include orientation to the graduate program and special topics by speakers from industry and other universities. Credit does not apply toward a graduate degree.
Term Offered: Spring, Fall

MIME 6960 Graduate Research and Thesis
[1-9 credit hours]
Masters thesis research.
Term Offered: Spring, Summer, Fall

MIME 6970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Master's/Doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

MIME 6980 Special Topics
[1-6 credit hours]
A special topic at the graduate level in Mechanical, Industrial or Manufacturing Engineering to be offered as a course during a term by a faculty member.
Term Offered: Spring, Summer, Fall

MIME 6990 Independent Study
[1-6 credit hours]
An independent study by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students in mechanical, industrial or manufacturing engineering.
Term Offered: Fall

MIME 8000 Advanced Engineering Mathematics I
[3 credit hours]
An advanced course in mathematical analysis for engineers. Topics include matrix methods, eigenvalues and eigenvectors, systems of equations, series representations including FFT, ordinary differential equations and Bessel functions. This course will make use of computer-aided-mathematics techniques and include engineering applications.
Term Offered: Fall

MIME 8100 Advanced Engineering Mathematics II
[3 credit hours]
Partial differential equations for engineering applications including elliptic, parabolic, hyperbolic differential and non-linear systems of equations. Solution procedures include separation of variables, Laplace transform methods, solutions using complex analysis including conformal mapping and numerical methods.
Prerequisites: MIME 8000 with a minimum grade of D-
Term Offered: Spring

MIME 8120 Advanced Measurement Systems
[3 credit hours]
Sensor selection, data acquisition system selection, evaluation of system response, digital sampling theory, statistical data analysis, space-time correlations, spectral analysis, analog and digital signal conditioning, and static and dynamic measurements.
Term Offered: Fall

MIME 8200 Advanced Dynamics
[3 credit hours]
Study of dynamics of a system of particles and rigid bodies using Newtonian and Lagrangian Mechanics including multi-body systems. Principles of nonlinear system dynamics and stability.
Term Offered: Spring

MIME 8300 Continuum Mechanics
[3 credit hours]
A unified approach to the study of the mechanics of continuous media; analysis of tensors; kinematics of material media; analysis of deformation and stress; the mathematical statement of the laws of conservation of mass, momentum and energy; formulation of the mechanical constitutive equations for various classes of solids and fluids.
Term Offered: Spring, Fall

MIME 8350 Elasticity
[3 credit hours]
Review of tensor analysis, analysis of stress and strain, three dimensional equations of elasticity, plane problems in rectangular Cartesian and polar coordinates.
Term Offered: Fall

MIME 8360 Plasticity
[3 credit hours]
Review of elastic stress-strain relations, analysis of strain rate and concept of stress rate, criteria of yielding and rules of plastic flow, elastoplastic bending and torsion, theory of slipline fields, mechanics of metal forming processes.
Term Offered: Spring

MIME 8380 Fracture Mechanics
[3 credit hours]
Principles of fracture mechanics and its applications to the prevention of fractures in components and structures, linear elastic and elastic-plastic fracture mechanics, fracture mechanisms, fracture toughness, applications to fatigue crack propagation.
Term Offered: Fall

MIME 8440 Computational Fluid Dynamics I
[3 credit hours]
Properties of various partial differential equations. Basics of finite difference methods. Governing equations of fluid mechanics and heat transfer. Numerical solution of inviscid flow equations. Methods for solving Euler equations. Treatment of shock waves. Applications to simple compressible flows. Numerical methods for boundary-layer type equations.
Term Offered: Fall

MIME 8450 Experimental Fluid Mechanics
[3 credit hours]
Digital data acquisition and analysis; limitations and interpretation of physical measurements; sources of errors and difficulties in experimental technique; advanced experimental methods for static and dynamic measurements in thermal systems and fluid flow.
Term Offered: Spring

MIME 8460 Intermediate Fluid Mechanics and Heat Transfer
[3 credit hours]
Development of the Navier-Stokes and the convective equations. Analysis of boundary-layer flows including similarity solutions, potential flows as well as convective heat transfer topics. This course is intended to provide a solid theoretical foundation in fluid mechanics and convective heat transfer for graduate students, preparing them for more specialized courses in Heath Transfer and Fluid Mechanics.
Term Offered: Spring, Fall

MIME 8470 Advanced Computational Fluid Dynamics
[3 credit hours]
This course presents numerical methods to solve hyperbolic equations for compressible fluids. The eigensystem and characteristics of the system of equations representing one-dimensional Euler flows are detailed in terms of conservative and primitive variables. The focus of this course is to introduce concepts of finite-volume upwinding schemes and numerical flux formulations. Numerical solution methods using both explicit and implicit schemes will be introduced in the class and be selectively exercised in the CFD coding project.
Prerequisites: MIME 3430 with a minimum grade of D- and MIME 3400 with a minimum grade of D-
Term Offered: Spring, Fall

MIME 8540 Computational Fluid Dynamics II
[3 credit hours]
Finite difference procedures applied to the solution of reduced forms of the Navier-Stokes equations. Numerical solution of compressible and incompressible forms of the Navier-Stokes equations for laminar and turbulent flows. Fundamental turbulence models. Solution enhancement methods including multi-grid schemes and the use of preconditioning. Grid generation procedures using algebraic and differential equation methods. Structured versus unstructured grid methods. Grid adaptation procedures. Computer program applications.
Prerequisites: MIME 8440 with a minimum grade of D-
Term Offered: Spring

MIME 8550 Turbulent Flow
[3 credit hours]
Study of the nature, origin and dynamics of turbulence. Governing equations of turbulent flows. Internal and external flows. Aspects of free shear flow, turbulent boundary layers and statistical descriptions are presented. Numerical and experimental methods applied to turbulent flow.
Term Offered: Spring, Fall

MIME 8570 Advanced Fluid Mechanics
[3 credit hours]
Review of general governing equations, stability of laminar flows, transition to turbulence, incompressible turbulent flows, compressible boundary layer flow, and a selected topic chosen with the class.
Prerequisites: MIME 8460 with a minimum grade of D-
Term Offered: Spring

MIME 8580 Advanced Heat Transfer
[3 credit hours]
Analytical and numerical methods for steady and transient heat conduction, convective heat transfer in boundary layers, models for external and internal forced flows, free flows, influence of turbulence, and phase change.
Prerequisites: MIME 8460 with a minimum grade of D-
Term Offered: Spring, Fall

MIME 8590 Advanced Gas Dynamics
[3 credit hours]
One-dimensional steady flows of prefect gases: fundamental laws and basic equations for subsonic, transonic, and supersonic processes. Multidimensional flows: exact solutions; linearized flows; characteristics; supersonic nozzle design. Unsteady one-dimensional flows with discontinuities. Measurements in compressible flows. A selected topics in viscous, heat conducting compressible flows and boundary layers.
Prerequisites: MIME 4560 with a minimum grade of D-
Term Offered: Spring

MIME 8650 Advanced Material Science and Engineering
[3 credit hours]
The course provides an overview of structure, properties, design considerations, processing and engineering application of engineering materials. Hard and Soft materials are introduced through lecture and demonstrations at three levels- 1) synthesis and characterization, 2) thermal, molecular and mechanical properties, and 3) design considerations for engineering applications.
Term Offered: Spring, Summer, Fall

MIME 8720 Design of Experiments
[3 credit hours]
Design and analysis of experiments including analysis of variance and regression analysis. Factorial, blocked and nested models are considered together with appropriate estimation and post ANOVA tests.
Term Offered: Fall

MIME 8800 Advanced Manufacturing Systems Engineering
[3 credit hours]
Advanced studies of traditional manufacturing processes and advanced manufacturing systems with emphasis on manufacturing engineering processes and equipment, machine tools, process planning, design an operation of manufacturing systems.

MIME 8810 Assembly And Joining Processes
[3 credit hours]
This course is comprised of two parts: joining processes and assembly systems. Commonly used joining methods, such as welding, mechanical fastening and adhesion are discussed. General principles of assembly are presented with extensive use of automobile assembly as an example.
Term Offered: Spring

MIME 8900 Independent Research
[1-16 credit hours]
Research credit hours toward the doctoral degree for students in the Mechanical, Industrial and Manufacturing Engineering Department. Students are to use the section number of their dissertation adviser.
Term Offered: Spring, Summer, Fall

MIME 8920 Special Projects
[1-6 credit hours]
A special project by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students interested in mechanical, industrial or manufacturing engineering.
Term Offered: Spring, Summer, Fall

MIME 8930 Graduate Seminar
[0 credit hours]
This is a seminar for graduate students in Mechanical, Industrial and Manufacturing Engineering. Topics include orientation to the graduate program and special topics by speakers from industry and other universities. Credit does not apply toward a graduate degree.
Term Offered: Spring, Fall

MIME 8960 Dissertation
[1-9 credit hours]
Doctoral dissertation research credit hours for students in the Mechanical, Industrial and Manufacturing Engineering Department. Students are to use the section number of their dissertation adviser.
Term Offered: Spring, Summer, Fall

MIME 8970 Graduate Engineering Internship
[1 credit hour]
Faculty advisor approved industry, government, or agency internship to provide an experiential learning component to the Master's/Doctoral degree program.
Prerequisites: GNEN 5000 with a minimum grade of S
Term Offered: Spring, Summer, Fall

MIME 8980 Special Topics
[1-6 credit hours]
A special topic at the graduate level in Mechanical, Industrial or Manufacturing Engineering to be offered as a course during a term by a faculty member.
Term Offered: Spring, Summer, Fall

MIME 8990 Independent Study
[1-6 credit hours]
An independent study by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students in mechanical, industrial or manufacturing engineering.
Term Offered: Summer, Fall

Medical Microbiology and Immunology (MMIM)

MMIM 6020 Advanced Immunology
[1 credit hour]
Student led discussion of recent literature supporting key concepts in the human immune response. Discussions will focus on how current research impacts our understanding of specific responses.

MMIM 6030 Current Topics in MMI
[1 credit hour]
This course includes attendance at biweekly seminars given by invited speakers and, on an alternating biweekly basis, the presentation of papers related to the seminar topics. May be repeated for credit.
Term Offered: Spring, Fall

MMIM 6040 Advanced Microbiology
[1 credit hour]
Student led discussion of recent literature supporting key concepts in the microbiology field, with an emphasis on bacteria and viruses. Discussions will focus on how current research impacts our understanding of specific pathogens.

MMIM 6890 Research in MMI
[1-9 credit hours]
Intensive study in field of interest, including experimental work before the qualifying exam. May be repeated for credit.

MMIM 6990 Thesis Research in MMI
[1-9 credit hours]
Intensive study in field of interest, including experimental work after master's student passes the qualifying exam. May be repeated for credit.

MMIM 8020 Advanced Immunology
[1 credit hour]
Student led discussion of recent literature supporting key concepts in the human immune response. Discussions will focus on how current research impacts our understanding of specific responses.

MMIM 8030 Current Topics in MMI
[1 credit hour]
This course includes attendance at biweekly seminars given by invited speakers and, on an alternating biweekly basis, the presentation of papers related to the seminar topics. May be repeated for credit.
Term Offered: Spring, Fall

MMIM 8040 Advanced Microbiology
[1 credit hour]
Student led discussion of recent literature supporting key concepts in the microbiology field, with an emphasis on bacteria and viruses. Discussions will focus on how current research impacts our understanding of specific pathogens.

MMIM 8890 Research in MMI
[1-9 credit hours]
Intensive study in field of interest, including experimental work before the qualifying exam. May be repeated for credit.

MMIM 9990 Dissertation Research in MMI
[1-9 credit hours]
Intensive study in field of interest, including experimental work after Ph. D. student passes the qualifying exam. May be repeated for credit.

Medical Physics (MPHY)

MPHY 6010 Survey of Diagnostic Medical Imaging I
[3 credit hours]
This course provides a survey of diagnostic imaging modalities including the physical principles and instrumentation of diagnostic imaging equipment. Radiographic and fluoroscopic imaging systems, x-ray computed tomography, Ultrasound, MRI, and basic of Nuclear Medicine will be covered. The course builds upon basic review of atomic and nuclear properties, production of x-rays, and interaction or radiation with matter.
Term Offered: Fall

MPHY 6020 Survey of Diagnostic Medical Imaging II
[3 credit hours]
This course builds on the materials taught in MPHY 6010/8010, and discusses advanced concepts in medical imaging including functioning MRI, SPECT, and PET imaging. Details of radioactivity and nuclear transformation, radionuclide production and radiopharmaceutics, radiation detection and measurement and scintillation camera will be covered. Advanced discussions on CT and US will also be presented.
Term Offered: Spring

MPHY 6040 Diagnostic Radiological Physic
[0-5 credit hours]
This course considers the physical principles and instrumentation of diagnostic image formation including radiography, fluoroscopy, computed tomography, ultrasound, nuclear medicine and magnetic resonance imaging.
Term Offered: Spring, Fall

MPHY 6060 Nuclear Medicine
[3 credit hours]
Course covers the physical aspects of diagnostic and therapeutic applications of radionuclides. This includes radiation detectors and imaging systems, emission tomography, counting statistics, equipment testing, radiopharmaceuticals and internal radiation dosimetry.
Term Offered: Summer, Fall

MPHY 6100 Clinical Imaging Review
[0-4 credit hours]
Review of the clinical aspect of diagnostic imaging of clinical modalities and anatomy as approved by instructor. Review typically will include reading, discussion, and clinical image review covering radiological anatomy, physiology, disease states, and considerations for diagnostic interpretation of images. May be repeated for credit.
Term Offered: Summer

MPHY 6110 Survey Clinical Radi Therapy
[2 credit hours]
A series of lectures on various topics in radiation therapy give an overview of radiation therapy in the clinical care of patients and familiarize students with a variety of options for treatment of cancer patients.
Term Offered: Spring, Fall

MPHY 6120 Radiation Dosimetry I
[3 credit hours]
Series of lectures covering basic concepts of radiation physics, interactions of ionizing radiation physics, interactions of ionizing radiation with matter, and fundamentals of radiation dosimetry techniques and instrumentation. An overview of principles of radiation therapy, radiation protection, nuclear medicine, and diagnostic radiology is given.
Term Offered: Fall

MPHY 6130 Radiation Dosimetry II
[3 credit hours]
Series of lectures covering interactions of ionizing radiation with matter and radiation dosimetry physics fundamentals in-depth. Cavity theories, integrating and pulse-mode dosimeters, dosimetry and calibration of photon and electron beams, and neutron dosimetry are considered in details.
Term Offered: Spring

MPHY 6160 Radiation Biology
[3 credit hours]
A series of introductory lectures on radiation biology with emphasis on the effects of radiation on cells and cellular components, tissues, and organisms. Dose-response relationships, dose-effect modifiers, and considerations applicable to radiation therapy treatments are among covered topics.
Term Offered: Spring

MPHY 6180 Physics of Radiation Therapy
[3 credit hours]
Series of lectures covering physics in radiation therapy. The calculations and measurements necessary to determine the radiation dose distribution in patients receiving radiotherapy will be presented. Newer treatment modalities, e.g., heavy ion and flash therapy, will be discussed.
Term Offered: Spring, Summer, Fall

MPHY 6190 Brachytherapy
[3 credit hours]
Fundamental information about the physical characteristics of the sources used in brachytherapy, the methods used for implant planning and evaluation of plans.
Term Offered: Summer

MPHY 6200 Radiatn Protect and Regulation
[3 credit hours]
Course considers the hazards associated with radioactivity and electromagnetic radiation, including types and sources of radiation, radiation measurement and units, dosimetry, radiation protection practices required by governmental regulation and medical facility accrediting bodies.
Term Offered: Summer

MPHY 6240 Physics of Medicine and Biol
[3 credit hours]
Overview of physics as applied to physiological and biological systems, including body mechanics, osmosis, respiratory and cardiovascular mechanisms, electric signals, speech, hearing, and sight.
Term Offered: Spring

MPHY 6260 Computers in Medical Physics
[2 credit hours]
Computer fundamentals to introduce students to the internal functions of computers and the system architectures and how they are used in the clinical environment as it relates to Medical Physics.
Term Offered: Spring

MPHY 6280 Electronics for Med Physicists
[2 credit hours]
Basics of electronics circuit design to perform specific tasks as it relates to medical physics applications.

MPHY 6300 Radiation Detection/Measuremen
[3 credit hours]
Introduces the student to the various equipment and methods used in radiation detection and measurement. Introduces advanced concepts in error analysis, energy spectra unfolding, fit results with function, etc. The lab portion of this course, PHYS6180, is taught through the University of Toledo.
Term Offered: Spring

MPHY 6310 Anatomy/Physiology
[4 credit hours]
The course will cover an overview of physiology at a cellular, and organ system levels. This will include normal function of human body and some clinical manifestations of human diseases. There will also be some introduction to basic skeletal system.
Term Offered: Fall

MPHY 6320 Practical Measurements in Radiation Therapy
[2 credit hours]
Series of practical labs covering quality assurance (QA) in radiation therapy. The calculations and measurements are performed during the lab. The rationale of each quality control test will be discussed. The scientific lab reports are generated and marked follow each lab.
Term Offered: Summer

MPHY 6400 Intro to LINAC in Radiation Th
[3 credit hours]
The electron linear accelerator will be described in theory and operation as it relates to medical physics and cancer patients. The physics aspect of particle acceleration and x-ray and electron generation using these units as well as dose delivery to the patient is considered.

MPHY 6500 Medical Physics Seminar
[1 credit hour]
Recent developments, special topics, critical analysis of recent publications, and literature reviews in specific areas of medical physics. May be repeated for credit.
Term Offered: Spring, Fall

MPHY 6520 Radiation Safety and Measremnt
[3 credit hours]
Review of fundamentals of radiation safety and protection, instrumentation, radioactivity, radiation interaction with matter, and biological effects of radiation. Also, measurement methods, safety practices and regulations for use of radiation in research and medicine is presented.

MPHY 6610 Clin Trng Radi Oncol Physics I
[4 credit hours]
This course offers clinical training in radiation oncology physics to graduate students. This will include clinical dosimetry concepts, anatomy & physiology, clinical radiobiology, and overview of special procedures including SRS, SBRT, IORT, HDR, LDR, Rad Safety and Regulations. QA of equipment and clinical responsibilities; review of TG 142, 51, 66 and other related reports.
Term Offered: Fall

MPHY 6620 Clin Trng Radi Oncol Physcs II
[4 credit hours]
This course offers advanced clinical training in radiation oncology physics to senior level graduate students. Advanced dosimetry concepts, Brachytherapy, IMRT, IGRT, adaptive IGRT. Other special procedures are covered. Also, lectures and hands-on training are provided so that students can fine Tone their techniques in Treatment Planning, QA Issues, daily clinical responsibilities and operation as a medical physicist are taught.
Term Offered: Spring, Summer, Fall

MPHY 6630 Clin Trng Radi Oncol Physc III
[5 credit hours]
Clinical training in radiation therapy physics to graduate students who have obtained an MS or Ph.D. degree in the field of medical physics or related area. May be repeated for credit
Term Offered: Summer

MPHY 6730 Medical Physics Research
[0-4 credit hours]
Students will participate in selected ongoing research programs of members of the department faculty. May be repeated for credit.
Term Offered: Summer

MPHY 6840 Independent Study: Med Physics
[0-12 credit hours]
Combination of reading, lecture and discussion within a defined area of medical physics. Defined topics are: dosimetry, internal dosimetry, radiobiology, monte carlo analysis, image processing, topical study. May be repeated for credit.
Term Offered: Spring, Summer, Fall

MPHY 6860 Independent Study in Radiology
[0-12 credit hours]
Combination of reading, lecture and discussion within a defined area of radiology. Defined topics are: radiographic imaging, computed tomography, magnetic resonance imaging, nuclear medicine, diagnostic ultrasound, diagnostic quality control, digital imaging. May be repeated for credit.
Term Offered: Spring, Summer, Fall

MPHY 6880 Independent Study: Rad Therapy
[0-12 credit hours]
Combination of reading, lecture, and discussion within a defined area of radiation therapy. Defined topics are: 3-D conformal treatment planning, 3-D dose compensators, stereotactic radiosurgery, electron arc therapy, photon and electron algorithms, treatment planning dosimetry verification, total body irradiation, total body skin. May be repeated for credit.

MPHY 8010 Survey of Diagnostic Medical Imaging I
[3 credit hours]
This course provides a survey of diagnostic imaging modalities including the physical principles and instrumentation of diagnostic imaging equipment. Radiographic and fluoroscopic imaging systems, x-ray computed tomography, Ultrasound, MRI, and basic of Nuclear Medicine will be covered. The course builds upon basic review of atomic and nuclear properties, production of x-rays, and interaction or radiation with matter.
Term Offered: Fall

MPHY 8020 Survey of Diagnostic Medical Imaging II
[3 credit hours]
This course builds on the materials taught in MPHY 6010/8010, and discusses advanced concepts in medical imaging including functioning MRI, SPECT, and PET imaging. Details of radioactivity and nuclear transformation, radionuclide production and radiopharmaceutics, radiation detection and measurement and scintillation camera will be covered. Advanced discussions on CT and US will also be presented.
Term Offered: Spring

MPHY 8040 Diag Radiological Physics
[0-5 credit hours]
This course considers the physical principles and instrumentation of diagnostic image formation including radiography, fluoroscopy, computed tomography, ultrasound, nuclear medicine and magnetic resonance imaging.
Term Offered: Spring, Fall

MPHY 8060 Nuclear Medicine
[3 credit hours]
Course covers the physical aspects of diagnostic and therapeutic applications of radionuclides. This includes radiation detectors and imaging systems, emission tomography, counting statistics, equipment testing, radiopharmaceuticals and internal radiation dosimetry.
Term Offered: Fall

MPHY 8110 Survey Clinical Radi Therapy
[2 credit hours]
A series of lectures on various topics in radiation therapy give an overview of radiation therapy in the clinical care of patients and familiarize students with a variety of options for treatment of cancer patients.
Term Offered: Spring, Fall

MPHY 8120 Radiation Dosimetry I
[3 credit hours]
Series of lectures covering basic concepts of radiation physics, interactions of ionizing radiation physics, interactions of ionizing radiation with matter, and fundamentals of radiation dosimetry techniques and instrumentation. An overview of principles of radiation therapy, radiation protection, nuclear medicine, and diagnostic radiology is given.
Term Offered: Fall

MPHY 8130 Radiation Dosimetry II
[3 credit hours]
Series of lectures covering interactions of ionizing radiation with matter and radiation dosimetry physics fundamentals in-depth. Cavity theories, integrating and pulse-mode dosimeters, dosimetry and calibration of photon and electron beams, and neutron dosimetry are considered in details.
Term Offered: Spring

MPHY 8160 Radiation Biology
[3 credit hours]
A series of introductory lectures on radiation biology with emphasis on the effects of radiation on cells and cellular components, tissues, and organisms. Dose-response relationships, dose-effect modifiers, and considerations applicable to radiation therapy treatments are among covered topics.
Term Offered: Spring

MPHY 8180 Physics of Radiation Therapy
[3 credit hours]
Series of lectures covering physics in radiation therapy. The calculations and measurements necessary to determine the radiation dose distribution in patients receiving radiotherapy will be presented. Newer treatment modalities, e.g., heavy ion and flash therapy, will be discussed.
Term Offered: Spring, Summer, Fall

MPHY 8190 Brachytherapy
[3 credit hours]
Fundamental information about the physical characteristics of the sources used in brachytherapy, the methods used for implant planning and evaluation of plans.
Term Offered: Summer

MPHY 8200 Radiatn Protect and Regulation
[3 credit hours]
Course considers the hazards associated with radioactivity and electromagnetic radiation, including types and sources of radiation, radiation measurement and units, dosimetry, radiation protection practices required by governmental regulation and medical facility accrediting bodies.
Term Offered: Summer

MPHY 8240 Physics of Medicine and Biol
[3 credit hours]
Overview of physics as applied to physiological and biological systems, including body mechanics, osmosis, respiratory and cardiovascular mechanisms, electric signals, speech, hearing, and sight.

MPHY 8260 Computer in Radiation Therapy
[2 credit hours]
Computer fundamentals and problem solving through programming. Typical problems include PDD, TAR, TMR, MU calculations, scatter summation, TMR for arc and dose distributions.

MPHY 8280 Electronics for Med Physicists
[2 credit hours]
Basics of electronics circuit design to perform specific tasks as it relates to medical physics applications.

MPHY 8300 Radiation Detection/Measuremen
[3 credit hours]
Introduces the student to the various equipment and methods used in radiation detection and measurement. Introduces advanced concepts in error analysis, energy spectra unfolding, fit results with function, etc. The lab portion of this course, PHYS6180, is taught through the University of Toledo.
Term Offered: Spring

MPHY 8310 Anatomy & Physiology
[4 credit hours]
The course will cover an overview of physiology at a cellular, and organ system levels. This will include normal function of human body and some clinical manifestations of human diseases. There will also be some introduction to basic skeletal system.
Term Offered: Fall

MPHY 8320 Practical Measurements in Rad
[2 credit hours]
Basic practical considerations in measurements of photon and electron beam parameters of the linear accelerator.
Term Offered: Summer

MPHY 8400 Intro to LINAC in Radiation Th
[3 credit hours]
The electron linear accelerator will be described in theory and operation as it relates to medical physics and cancer patients. The physics aspect of particle acceleration and x-ray and electron generation using these units as well as dose delivery to the patient is considered.

MPHY 8500 Medical Physics Seminar
[1 credit hour]
Recent developments, special topics, critical analysis of recent publications, and literature reviews in specific areas of medical physics. May be repeated for credit.
Term Offered: Spring, Fall

MPHY 8520 Radiation Safety and Measremnt
[3 credit hours]
Review of fundamentals of radiation safety and protection, instrumentation, radioactivity, radiation interaction with matter, and biological effects of radiation. Also, measurement methods, safety practices and regulations for use of radiation in research and medicine is presented.

MPHY 8610 Clin Trng Radi Oncol Physics I
[4 credit hours]
This course offers clinical training in radiation oncology physics to graduate students. This will include clinical dosimetry concepts, anatomy & physiology, clinical radiobiology, and overview of special procedures including SRS, SBRT, IORT, HDR, LDR, Rad Safety and Regulations. QA of equipment and clinical responsibilities; review of TG 142, 51, 66 and other related reports.
Term Offered: Fall

MPHY 8620 Clin Trng Radi Oncol Physcs II
[4 credit hours]
This course offers advanced clinical training in radiation oncology physics to senior level graduate students. Advanced dosimetry concepts, Brachytherapy, IMRT, IGRT, adaptive IGRT, other special procedures are covered. Also, lectures and hands-on training are provided so that students can fine tone their techniques in Treatment Planning, QA Issues, daily clinical responsibilities and operations as a medical physicist are taught.
Term Offered: Spring

MPHY 8630 Clin Trng Radi Oncol Physc III
[5 credit hours]
Clinical training in radiation therapy physics to graduate students who have obtained an MS or Ph.D. degree in the field of medical physics or related area. May be repeated for credit
Term Offered: Summer

MPHY 8730 Medical Physics Research
[0-4 credit hours]
Students will participate in selected ongoing research programs of members of the department faculty. May be repeated for credit.

MPHY 8840 Independent Study: Med Physics
[0-12 credit hours]
Combination of reading, lecture and discussion within a defined area of medical physics. Defined topics are: dosimetry, internal dosimetry, radiobiology, monte carlo analysis, image processing, topical study. May be repeated for credit.
Term Offered: Summer, Fall

MPHY 8860 Independent Study in Radiology
[0-12 credit hours]
Combination of reading, lecture and discussion within a defined area of radiology. Defined topics are: radiographic imaging, computed tomography, magnetic resonance imaging, nuclear medicine, diagnostic ultrasound, diagnostic quality control, digital imaging. May be repeated for credit.

MPHY 8880 Independent Study: Rad Therapy
[0-12 credit hours]
Combination of reading, lecture, and discussion within a defined area of radiation therapy. Defined topics are: 3-D conformal treatment planning, 3-D dose compensators, stereotactic radiosurgery, electron arc therapy, photon and electron algorithms, treatment planning dosimetry verification, total body irradiation, total body skin. May be repeated for credit.

MPHY 8960 Dissertation Research
[0-15 credit hours]
Disciplinary or interdisciplinary investigation of significant problems at the doctoral level leading to the preparation of a scientific project for presentation as a dissertation.
Term Offered: Spring, Summer, Fall

Medicinal-Biological Chemistry (MBC)

MBC 5100 Ethical Conduct Research
[1 credit hour]
Consideration of the scientific, ethical and legal obligations of the graduate student researcher.
Term Offered: Spring, Summer

MBC 5310 Medicinal Chemistry I: Drug Action And Design
[2 credit hours]
An introductory course presenting the basic chemical principles governing the behavior of drugs and the design of new therapeutics.
Term Offered: Fall

MBC 5380 Medicinal And Poisonous Plants
[3 credit hours]
Lecture/field course examining medicinal and harmful properties of herbals and plants using pharmacognosy, clinical trials and local plant examples.
Term Offered: Summer, Fall

MBC 5550 Physiological Chemistry I: Structure And Function Of Biological Macromolecules
[3 credit hours]
An examination of the levels of structure of proteins, nucleic acids, other biomolecules and biomolecular assemblies.
Term Offered: Fall

MBC 5552 Physiological Chemistry II Cellular Metabolism and Homeostasis
[2 credit hours]
An examination of the chemistry and regulation of metabolic processes in cells, interacting cells and tissues.
Prerequisites: MBC 3550 with a minimum grade of D- or MBC 5550 with a minimum grade of D-
Term Offered: Spring

MBC 5620 Biochemical Techniques
[2 credit hours]
A detailed study of biochemical laboratory techniques necessary for the development of novel therapeutics, including bioassays and data analysis.
Term Offered: Fall

MBC 5860 Microbiology for Pharmaceutical Professionals
[2 credit hours]
This is a lecture and laboratory course with emphasis on microorganisms that cause disease. Special attention will be paid to structures and mechanisms present in microorganisms that can be exploited to inhibit the growth and survival of these organisms in a human host.
Prerequisites: MBC 3550 with a minimum grade of D- or MBC 5550 with a minimum grade of D-
Term Offered: Spring

MBC 5900 Medicinal Chemistry Seminar
[1 credit hour]
Presentation and discussion of advanced research topics in medicinal chemistry, with an emphasis on evaluating and criticizing emerging data as a way of testing hypotheses.
Term Offered: Spring, Summer, Fall

MBC 6100 Advanced Immunology
[2 credit hours]
Readings in and critical analysis of the recent literature in immunology and basic immunologic responses, especially as considered in immunotherapy.
Term Offered: Spring, Fall

MBC 6190 Advanced Medicinal Chemistry
[4 credit hours]
Discussion of the qualitative and quantitative aspects of the design of new therapeutic agents. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids are examined.
Term Offered: Fall

MBC 6200 Biomedicinal Chemistry
[4 credit hours]
Examination of the primary literature on approaches to the design of new therapeutic agents. Recent novel directions in the design of drugs will be examined and compared.
Prerequisites: MBC 6190 with a minimum grade of D-
Term Offered: Spring

MBC 6300 Biomedicinal Chemistry Laboratory I
[1 credit hour]
Experimental research problems in biomedicinal chemistry.
Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 6550 with a minimum grade of D-)
Term Offered: Spring, Fall

MBC 6310 Biomedicinal Chemistry Laboratory II
[3 credit hours]
Additional experimental research problems in biomedicinal chemistry (see MBC 6300/8300).
Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 6550 with a minimum grade of D-)
Term Offered: Spring, Summer, Fall

MBC 6400 Cannabis Science: Plants and Products
[3 credit hours]
CS Plants & Products considers in-depth the growth of Cannabis sativa and its subspecies as well as the production and physical properties of both chemical and consumer products derived from them. Examining the factors, procedures, and techniques that make for optimal medicinal and recreational outcomes, the course is designed for learners with diverse backgrounds, interests, and intents
Term Offered: Spring, Summer, Fall

MBC 6450 Advanced Synthetic and Medicinal Chemistry
[2 credit hours]
Readings in and critical analysis of recent literature in synthetic and medicinal chemistry research.
Term Offered: Spring, Fall

MBC 6550 Biochemistry
[4 credit hours]
A consideration of the structure and function of biological macromolecules as well as the basic and regulated metabolism of cells.
Term Offered: Fall

MBC 6960 M.s. Thesis Research In Medicinal Chemistry
[1-15 credit hours]
Development and pursuit of research leading to an M.S. thesis in medicinal chemistry.
Term Offered: Spring, Summer, Fall

MBC 6980 Special Topics In Biomedicinal Chemistry
[1-5 credit hours]
Selected study of topics in medicinal chemistry. New chemical and biochemical strategies in drug design are examined in detail.
Term Offered: Spring, Summer, Fall

MBC 7100 Ethnical Conduct of Research
[1 credit hour]
Consideration of the scientific, ethical and legal obligations of the graduate student researcher.
Term Offered: Spring, Summer

MBC 7620 Biochemical Techniques
[2 credit hours]
A detailed study of biochemical laboratory techniques necessary for the development of novel therapeutics, including bioassays and data analysis.
Term Offered: Fall

MBC 7900 Medicinal Chemistry Seminar
[1 credit hour]
Presentation and discussion of advanced research topics in medicinal chemistry, with an emphasis on evaluating and criticizing emerging data as a way of testing hypotheses.
Term Offered: Spring, Summer, Fall

MBC 8100 Advanced Immunology
[2 credit hours]
Readings in and critical analysis of the recent literature in immunology and basic immunologic responses, especially as considered in immunotherapy.
Term Offered: Spring, Fall

MBC 8190 Advanced Medicinal Chemistry
[4 credit hours]
Discussion of the qualitative and quantitative aspects of the design of new therapeutic agents. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids are examined.
Term Offered: Fall

MBC 8200 Biomedicinal Chemistry
[4 credit hours]
Examination of the primary literature on approaches to the design of new therapeutic agents. Recent novel directions in the design of drugs will be examined and compared.
Prerequisites: MBC 8190 with a minimum grade of D-
Term Offered: Spring

MBC 8300 Biomedicinal Chemistry Laboratory I
[1 credit hour]
Experimental research problems in biomedicinal chemistry.
Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 8550 with a minimum grade of D-)
Term Offered: Spring, Fall

MBC 8310 Biomedicinal Chemistry Laboratory II
[3 credit hours]
Additional experimental research problems in biomedicinal chemistry (see MBC 6300/8300).
Prerequisites: (MBC 6190 with a minimum grade of D- and MBC 8550 with a minimum grade of D-)
Term Offered: Spring, Summer, Fall

MBC 8450 Advanced Synthetic and Medicinal Chemistry
[2 credit hours]
Readings in and critical analysis of recent literature in synthetic and medicinal chemistry research.
Term Offered: Spring, Fall

MBC 8550 Biochemistry
[4 credit hours]
A consideration of the structure and function of biological macromolecules as well as the basic and regulated metabolism of cells.
Term Offered: Fall

MBC 8960 Ph.D. Dissertation Research In Medicinal Chemistry
[1-15 credit hours]
Development and pursuit of research leading to a Ph.D. dissertation in medicinal chemistry.
Term Offered: Spring, Summer, Fall

MBC 8980 Special Topics In Biomedicinal Chemistry
[1-5 credit hours]
Selected study of topics in medicinal chemistry. New chemical and biochemical strategies in drug design are examined in detail.
Term Offered: Spring, Summer, Fall

Medicine (MEDI)

MEDI 5800 Instructional Strategies in Medical Education
[3 credit hours]
This 4-week, fully online course prepares faculty to effectively design learning objectives, instructional materials, and learning activities that align with teaching modalities and assessments for medical education. Participants will gain insights about instructional strategies and best practices in designing and delivering medical education.
Term Offered: Spring, Summer, Fall

MEDI 5810 Capstone In Medical Educational Research
[1-3 credit hours]
This is a formal independent project achieved by applying principles of research and/or measurement to solve a particular problem in health professions education and culminating in a written discourse, journal manuscript, or education grant application.
Term Offered: Spring, Summer, Fall

MEDI 6050 Advanced Biostatistics
[1-3 credit hours]
Application of advanced statistical techniques with particular emphasis on problems in the biomedical sciences. Multiple regression, methods of analysis of variance, categorical data analysis including logistic regression, nonparametric and survival analysis. Problems whose solutions involve using a statistical program (SAS or SPSS).

MEDI 6200 Managed Health Care
[2 credit hours]
This course will enable the health care professional to understand those forces driving change in the managed care era and will help prepare them for the future.

MEDI 6720 Current Topics in Medicine
[0-4 credit hours]
A lecture and/or seminar course on topics of current interest in medicine with special emphasis on the fundamentals of human life under normal, experimental, or pathological conditions. May be repeated for credit.

MEDI 8890 Independent Study in Medicine
[0-12 credit hours]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit.

Microbiology (MICB)

MICB 5020 Medical Microbiology II
[5 credit hours]

MICB 6200 Microbiology Human Infections
[3 credit hours]
A series of lectures describing the classification, replication strategics and structural composition of the major families of animal viruses that infect humans.

MICB 6210 Advanced Virology
[3 credit hours]
An in-depth analysis of current research in virology including the reading and analysis of recently published papers on the replication and molecular biology of animal viruses, particularly viruses belonging to the Togaviridiae and coronaviridae and the bacterial and plant viruses that are homologous to these two families of animal viruses.

MICB 6220 Laboratory Molecular Virology
[4 credit hours]
A laboratory course in which the students will learn to grow tissue culture cells and grow, quantify, purify, and analyze animal viruses. The student will complete a research project on a problem concerning the molecular biology of animal virus replication.

MICB 6890 Independent Study Microbiology
[0-15 credit hours]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit
Term Offered: Spring, Summer, Fall

MICB 8200 Microbiology Human Infections
[3 credit hours]
A series of lectures describing the classification, replication strategics and structural composition of the major families of animal viruses that infect humans.

MICB 8210 Advanced Virology
[3 credit hours]
An in-depth analysis of current research in virology including the reading and analysis of recently published papers on the replication and molecular biology of animal viruses, particularly viruses belonging to the Togaviridiae and coronaviridae and the bacterial and plant viruses that are homologous to these two families of animal viruses.

MICB 8220 Laboratory Molecular Virology
[4 credit hours]
A laboratory course in which the students will learn to grow tissue culture cells and grow, quantify, purify, and analyze animal viruses. The student will complete a research project on a problem concerning the molecular biology of animal virus replication.

MICB 8890 Independent Study Microbiology
[0-15 credit hours]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit
Term Offered: Spring, Summer, Fall

Music (MUS)

MUS 5010 University Band
[1 credit hour]
The Rocket Marching Band appears at all home football games during the fall semester. Any UT student with previous experience may participate. Contact the instructor for audition information.
Term Offered: Spring, Fall

MUS 5020 Jazz Ensemble
[1 credit hour]
Students rehearse and perform a diverse repertoire for large jazz ensemble. Open to all students by audition in the first week of each semester and/or permisison of instructor.
Term Offered: Spring, Fall

MUS 5040 University Wind Ensemble
[1 credit hour]
Open to a limited number of qualified students.

MUS 5050 Chamber Music Ensembles
[1 credit hour]
The study and performance of chamber music literature in classical or jazz styles. Groups are determined by audition at the beginning of each semester, and are open to a limited number of qualified students upon sufficient demand and with the permission of the instructor.
Term Offered: Spring, Fall

MUS 5060 Symphonic Band
[1 credit hour]
Students rehearse and perform a diverse concert band repertoire. Open to all students through audition or permission of instructor.
Term Offered: Spring, Fall

MUS 5070 Varsity Band
[1 credit hour]
Students rehearse and perform a diverse athletic band repertoire. Open to all students through audition or permission of instructor.
Term Offered: Spring, Fall

MUS 5090 University Orchestra
[1 credit hour]
Open to any qualified student.
Term Offered: Spring, Fall

MUS 5130 University Chorus
[1 credit hour]
This non-auditioned mixed (SATB) choral ensemble is open to any student. Performing music in a variety of styles, this ensemble places a primary focus on developing musicianship and basic vocal technique.
Term Offered: Spring, Fall

MUS 5140 Concert Chorale
[1 credit hour]
This auditioned mixed (SATB) choral ensemble is the premiere choral ensemble at the University of Toledo. With a focus on advanced vocal techniques and performance, this ensemble requires an audition and instructor approval.
Term Offered: Spring, Fall

MUS 5150 Jazz Vocalstra
[1 credit hour]
Students rehearse and perform traditional vocal jazz literature. Open to qualified students by audition at the beginning of each semester and/or permission of instructor.
Term Offered: Spring, Fall

MUS 5160 Women's Chorus
[1 credit hour]
This non-auditioned treble voice (SSAA) choral ensemble is open to any student. Performing music in a variety of styles, this ensemble focuses on developing musicianship and basic vocal technique.
Term Offered: Spring, Fall

MUS 5180 Men's Chorus
[1 credit hour]
This non-auditioned Tenor/Bass voiced (TTBB) choral ensemble is open to any student. Performing music in a variety of styles, this ensemble focuses on developing musicianship and basic vocal technique.
Term Offered: Spring, Fall

MUS 5190 Opera Workshop
[1 credit hour]
Open to any qualified student.
Term Offered: Spring, Fall

MUS 5440 Music History And Literature: Special Topics
[3 credit hours]
The area of study will be announced at the time the course is offered.
Term Offered: Spring

MUS 5510 Choral Conducting
[2 credit hours]
Conducting techniques and rehearsal routine, especially concerned with choral groups. Opportunities to direct student choral groups.
Prerequisites: MUS 3500 with a minimum grade of C
Term Offered: Spring, Summer, Fall

MUS 5520 Instrumental Conducting
[2 credit hours]
Conducting techniques and rehearsal routine especially concerned with instrumental ensembles. Opportunities to direct student instrumental groups.
Prerequisites: MUS 3500 with a minimum grade of C
Term Offered: Spring

MUS 5590 Piano Pedagogy
[2 credit hours]
Exploration of techniques and materials for comprehensive, private and group instruction.
Term Offered: Spring, Fall

MUS 5610 Analytical Techniques
[3 credit hours]
Application of various analytical theories of music to selected works from different style periods to further the understanding of musical forms and works.
Prerequisites: MUS 3500 with a minimum grade of C
Term Offered: Fall

MUS 5630 Counterpoint: Comparison Of Styles
[3 credit hours]
A study of 16th, 18th and 20th century polyphony. Analysis of selected works and composition exercises will be the basis for comparing and contrasting these three styles.
Prerequisites: MUS 3500 with a minimum grade of C
Term Offered: Spring

MUS 5800 Applied Music
[1-2 credit hours]
Private studio music lessons intended primarily for music education graduate students or for music performance graduate students on a secondary instrument. 1 or 2 credit hours.
Term Offered: Spring, Summer, Fall

MUS 5900 Graduate Studies In Music
[3 credit hours]
The study of sources and bibliographical materials in music.
Term Offered: Fall

MUS 6000 Master's Recital
[0 credit hours]
Required for the Master of Music Performance degree. A passing grade documents successful completion of the recital requirement. Must be taken during the semester in which the recital is presented.
Corequisites: MUS 6800
Term Offered: Spring, Summer, Fall

MUS 6450 Jazz history, Style and Analysis
[3 credit hours]
An in-depth study of jazz styles, trends, performers and composers through historical and analytical research.
Term Offered: Spring

MUS 6560 Jazz Pedagogy and Conducting
[2 credit hours]
An in-depth study of jazz pedagogical materials and methods as well as rehearsal and conducting techniques.
Term Offered: Spring, Fall

MUS 6600 Jazz Composition and Arranging Seminar
[2 credit hours]
Examination and analysis of jazz scores with creative assignments in jazz orchestration and composition in traditional and contemporary styles. May be repeated one time.
Term Offered: Fall

MUS 6690 Seminar In Music Composition
[2 credit hours]
May be repeated, but maximum accumulated credit is six hours. Beginning composition, including writing in the smaller musical forms, to advanced compositions for large.
Term Offered: Spring, Fall

MUS 6700 Jazz Improvisation Seminar
[2 credit hours]
Practical application and analysis of jazz improvisation methods and techniques as applied to contemporary jazz composition and performance. May be repeated one time.
Term Offered: Spring, Fall

MUS 6800 Applied Music
[2-5 credit hours]
Private studio music lessons for music performance graduate students, including the study of performance methods and literature of the highest levels. Preparation for professional-level performance. May be repeated for credit with permission of the instructor.
Term Offered: Spring, Summer, Fall

MUS 6980 Seminar: Special Topics
[1-3 credit hours]
Selected subjects in music in areas of special interest to the advanced master's degree student. The seminar topic will be announced in the semester schedule of classes.
Term Offered: Spring, Summer, Fall

MUS 6990 Independent Study
[1-3 credit hours]
Designed to meet the needs of individual students who wish to pursue projects in the area of music.
Term Offered: Spring, Summer, Fall

Music Education (MED)

MED 5340 Curriculum Development In Music Education
[3 credit hours]
The impact of historical, sociological and philosophical influences on various music curricula, past and present. Integration of skill development and content learning for designing comprehensive and sequential objectives for school music programs.
Term Offered: Spring, Fall

MED 5360 Pedagogy Of Aural Perception
[3 credit hours]
Theory and techniques for teaching of musical skills. Sequences for development of tonal and rhythm skills, techniques and materials for instruction plus measurement and evaluation of music learning.
Term Offered: Spring, Fall

MED 5370 Psychology Of Music
[3 credit hours]
Study of theories of musical behavior and pattern perception.
Term Offered: Spring, Fall

MED 5990 Independent Study In Music Education
[1-3 credit hours]
Individual study is designed to provide a student the opportunity to work independently on professional problems under the direction of the faculty of the Department of Music.
Term Offered: Spring, Summer, Fall

MED 6920 Master's Research Project In Music Education
[1-3 credit hours]
Open to the graduate student who elects a research project to fulfill the research requirement of the master's degree program.
Term Offered: Spring, Summer, Fall

MED 6930 Seminar - Selected Topics In Music Education
[1-3 credit hours]
Critical inquiry into specific topics through lectures, class seminar reports and discussion. Seminar topics announced in schedule of classes.

MED 6960 Master's Research Thesis In Music Education
[1-3 credit hours]
Open to the graduate student who elects a master's thesis to fulfill the research requirement of the master's degree program.
Term Offered: Spring, Summer, Fall

Neurosciences and Neurological Disorders (NNDP)

NNDP 6500 Seminar in Neuroscience
[0 credit hours]
Training and practice in presenting seminars on neuroscience research. May be repeated for credit.
Term Offered: Spring, Fall

NNDP 6540 Journal Paper Review Neuroscience
[1-2 credit hours]
A weekly report on recent advances in neurobiology taken from original papers to give the students an opportunity to find, critically assess, and report on these studies. Students will develop skills for communicating scientific ideas in a seminar format. May be repeated for credit.
Term Offered: Spring

NNDP 6890 Independ Study in Neuroscience
[1-12 credit hours]
Independent library and laboratory work under the supervision of the major advisor. May be repeated for credit.
Term Offered: Summer, Fall

NNDP 6910 Biomedical Publishing
[1 credit hour]
Academic and student development course offering an introduction to an open access peer reviewed journal. Offers strategies to gain a better understanding of this example of journal system by examining and eventually assisting with The University of Toledo Journal of Medical Sciences (Translation) through process, procedures, and application.
Term Offered: Spring, Summer, Fall

NNDP 6990 Thesis Research Neurosci Neuro
[1-15 credit hours]

NNDP 7010 Functional Neuroanatomy
[3 credit hours]
The goal of this course is to provide the student with a detailed understanding of multiple aspects of functional neuroanatomy.
Term Offered: Fall

NNDP 8500 Seminar in Neuroscience
[1 credit hour]
Training and practice in presenting seminars on neuroscience research. May be repeated for credit.
Term Offered: Spring, Fall

NNDP 8540 Journal Paper Review Neuroscience
[1-2 credit hours]
A weekly report on recent advances in neurobiology taken from original papers to give the students an opportunity to find, critically assess, and report on these studies. Students will develop skills for communicating scientific ideas in a seminar format. May be repeated for credit.
Term Offered: Spring

NNDP 8990 Research in Neuroscience
[1-15 credit hours]
Formal intensive study of specific topics in neuroscience. Individual studies may include the application of both experimental and theoretical scientific methods, with the goal of advancing our understanding of how the brain works and influences behavior. May be repeated for credit.
Term Offered: Spring, Summer, Fall

NNDP 9990 Dissertation Research in NNDP
[1-9 credit hours]
Formal intensive study of specific topics in neuroscience. Individual studies may include the application of both experimental and theoretical scientific methods, with the goal of advancing our understanding of how the brain works and influences behavior. May be repeated for credit.
Term Offered: Spring, Summer, Fall

Nursing (NURS)

NURS 5000 Population Focused Nursing
[4 credit hours]
Focus on exploring population and community health, applying nursing and other related sciences to assess populations, communities, and aggregates to design effective nursing systems in collaboration with partners to improve health.
Term Offered: Summer, Fall

NURS 5001 Health Assessment and Technical Competencies I
[5 credit hours]
Focus on holistic assessment of diverse populations across the lifespan. Emphasis on the application of knowledge and skills through experiential and interprofessional activities, while laying the foundation for scholarly inquiry.
Term Offered: Summer, Fall

NURS 5002 Physiology and Pathophysiology I
[3 credit hours]
Examine physical, biological, nutritional, microbiological sciences and principles related to human physiology. Focus on advanced physiologic and pathophysiologic mechanisms underlying human responses of nutritional, genetic, inflammatory, immune, and nervous system diseases.
Term Offered: Summer, Fall

NURS 5003 Professional Socialization
[3 credit hours]
Understanding of the professional nursing role including historical, legal, ethical, political, economic, and cultural diversity that impact nursing practice. Examine nursing theories and models of professional nursing practice.
Term Offered: Summer, Fall

NURS 5004 Nursing Care of Adults in Health and Illness
[5 credit hours]
Focus on health promotion, disease prevention, and implementation of evidence-based care with emphasis on nursing interventions, management, and the evaluation of effectiveness in the care of adults with chronic health problems.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5001 with a minimum grade of B and NURS 5002 with a minimum grade of B
Term Offered: Spring, Summer

NURS 5005 Health Assessment and Technical Competencies II
[3 credit hours]
Focus on application of assessment skills and demonstrating safe procedures for high-risk interventions in simulated experiences. Emphasis on the concepts of clinical judgment, professional behaviors, and interprofessional collaboration.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5001 with a minimum grade of B and NURS 5002 with a minimum grade of B and NURS 5003 with a minimum grade of B
Corequisites: NURS 5004, NURS 5006, NURS 5007
Term Offered: Spring, Summer

NURS 5006 Physiology and Pathophysiology II
[3 credit hours]
Focus on advanced physiologic and pathophysiologic mechanisms underlying disease processes across the life span and prevention strategies. Examine cardiovascular, respiratory, endocrine, musculoskeletal, nervous, genitourinary, hepatobiliary, renal, integumentary and gastrointestinal systems.
Prerequisites: NURS 5002 with a minimum grade of B
Term Offered: Spring, Summer

NURS 5007 Pharmacology for the Graduate Entry Nurse
[3 credit hours]
Focus on pharmacologic principles with emphasizes on physiological responses to drugs, expected outcomes, and potential drug interactions. Prepares for critical thinking in application of pharmacotherapy principles to nursing practice.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5001 with a minimum grade of B and NURS 5002 with a minimum grade of B and NURS 5003 with a minimum grade of B
Term Offered: Spring, Summer

NURS 5008 Healthcare for Women and Children
[4 credit hours]
Focus on management and care of diverse childbearing families and children during health and illness in a variety of settings.
Prerequisites: NURS 5004 with a minimum grade of B and NURS 5005 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5007 with a minimum grade of B
Term Offered: Summer

NURS 5009 Mental Health and Therapeutic Communications
[3 credit hours]
Students will develop a psychotherapeutic relationship with individuals, groups, and families who are experiencing complex mental health disorders, including substance abuse, trauma, serious mental illness, and impaired functioning.
Term Offered: Summer

NURS 5220 Capstone Seminar
[1-3 credit hours]
Capstone projects are culminating experiences completed at the end of a plan of study. They are designed to encourage students to think critically, solve challenging problems, and develop skills such as oral communication, public speaking, research skills, media literacy, teamwork, planning, self-sufficiency, or goal setting.
Prerequisites: NURS 6910 (may be taken concurrently) with a minimum grade of B or NURS 5910 (may be taken concurrently) with a minimum grade of B and NURS 5220 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Summer, Fall

NURS 5530 Public Policy and Health Care
[3 credit hours]
Explores the public policy process from agenda setting through program evaluation. Focus is on how health problems are brought to the attention of government and solutions are obtained. Some field work is expected.
Term Offered: Spring, Summer, Fall

NURS 5610 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adults
[7 credit hours]
The first course in the Psychiatric-Mental Health Nurse Practitioner track focuses on preparing the student in the advanced practice role of assessment, diagnosis, and treatment planning of select acute and chronic psychiatric disorders and mental health care needs of individuals across the lifespan.
Prerequisites: NURS 5740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 (may be taken concurrently) with a minimum grade of B

NURS 5620 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical II Child, Adolescent, Family
[7 credit hours]
The course explores the major group and family psychotherapeutic approaches. Theories and models of group and family psychotherapy are examined as they can be applied across the lifespan, with diverse populations, and in traditional and non-traditional settings.
Prerequisites: NURS 5610 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5680 with a minimum grade of B

NURS 5630 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adults
[9 credit hours]
Focuses on the role of the advanced practice nurse in management of children, adolescents, adults, older adults with acute or chronic psychiatric or mental health concerns.
Prerequisites: NURS 5610 with a minimum grade of B and NURS 5620 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B

NURS 5680 Advanced Physiology and Pathophysiology
[3 credit hours]
Focuses on advanced physiologic and pathophysiologic mechanisms underlying human responses to illness across ther life-span. Students will build on existing knowledge of human anatomy and physiology.
Term Offered: Spring, Fall

NURS 5690 Advanced Pharmacotherapeutics
[3 credit hours]
Focuses on advanced pharmacologic principles in decision making for pharmacotherapy. Emphasizes physiological responses to drugs, expected outcomes, adverse reactions, and potential drug interactions. Discusses professional responsibilities of prescriptive privileges.
Term Offered: Spring, Fall

NURS 5710 Advanced Pediatric Pharmacotherapeutics
[1 credit hour]
Focuses on advanced pharmacologic principles in pediatric pharmacotherapy decision making for the advanced practice as a primary care pediatric nurse practitioner. The focus in on principles of pharmacokinetics, pharmacodynamics, and evidence-based pharmacotherapeutics for the care of infants, children, adolescents, young adults.
Corequisites: NURS 5690
Term Offered: Fall

NURS 5720 Advanced Pediatric Physiology and Pathophysiology
[1 credit hour]
This course provides a scientific foundation for advanced practice as a primary care pediatric nurse practitioner. The focus in on developmental physiology and pathophysiology of infants, children, adolescents, young adults. The embryology of organs and systems of the body will be discussed from conception through birth. Alterations in the function of organs and systems of the body affecting the pediatric population will be presented.
Corequisites: NURS 5680
Term Offered: Fall

NURS 5730 Advanced Pediatric Health Assessment
[3 credit hours]
This course provides the foundation for advanced assessment skills required to practice as a primary care pediatric nurse practitioner. The focus in on the health assessment of infants, children, adolescents, young adults, and their families. A comprehensive, holistic, and developmental approach to advanced practice will focus on the specific knowledge and skills required when conducting pediatric history and physical examinations.
Term Offered: Spring

NURS 5810 Pediatric Nurse Practitioner Clinical I: Care of Children and Concepts of Wellness
[7 credit hours]
Focuses on the health care needs of children and adolescents and principles of health promotion and wellness. Students will have opportunity to begin development of skills in primary health care settings.
Prerequisites: NURS 5740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5400 with a minimum grade of B
Term Offered: Summer

NURS 5820 Pediatric Nurse Practitioner Clinical II: Acute/Chronic
[6 credit hours]
Focuses on the care of children and adolescents with an emphasis on the management of common acute and stable chronic illnesses.
Prerequisites: NURS 5810 with a minimum grade of C
Term Offered: Fall

NURS 5830 Pediatric Nurse Practitioner Clinical III: Complex, Chronic Illnesses or Disabilities
[7 credit hours]
Focuses on management of common and complex acute and chronic conditions of children and adolescents. Issues of disability and developmental conditions are addressed. Emphasis is on integration of the advanced practice role.
Prerequisites: NURS 5820 with a minimum grade of B
Term Offered: Spring

NURS 5910 Advanced Research for Evidence Based Nursing Practice
[3 credit hours]
Critically evaluate published research for clinical relevance, identify a research problem, select a conceptual framework, review selected literature, and prepare a quantitative or qualitative research proposal.
Prerequisites: (NURS 5400 with a minimum grade of B and INDI 6000 with a minimum grade of C) or (NURS 7400 with a minimum grade of B and INDI 8000 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

NURS 5980 Comprehensive Exam in Nursing
[3 credit hours]
Program capstone emphasizes independent comprehensive review preparation for exams with synthesis of knowledge from the total graduate nursing curriculum and review of relevant literature in selected field of study.
Term Offered: Spring, Summer, Fall

NURS 6001 Nursing Care of Adults with Complex Health Problems
[5 credit hours]
Focus on management and care of patients with complex health problems in acute-care settings. Emphasis is on utilization of the nursing process, evidence-based care, leadership, interprofessional collaboration, refinement of clinical judgement, and decision-making skills for safe and effective quality health care.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5001 with a minimum grade of B and NURS 5002 with a minimum grade of B and NURS 5004 with a minimum grade of B and NURS 5005 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5007 with a minimum grade of B
Term Offered: Fall

NURS 6002 Quality and Informatics in Healthcare
[3 credit hours]
Exploration of informatics utilized in and supporting evidence-based practice, and quality in healthcare. Utilization of theory, methods, tools, and processes for identifying and analyzing issues, appraisal of appropriate action selection, implementation, and evaluation for improvement and control of quality outcomes in healthcare organizations.
Term Offered: Fall

NURS 6003 Experiencing Nursing Systems Practicum
[7 credit hours]
Focus on integration of nursing knowledge and skills in designing, implementing and evaluating nursing systems addressing client needs while partnered with an expert registered nurse in clinical experiences.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5004 with a minimum grade of B and NURS 5008 with a minimum grade of B and NURS 6001 with a minimum grade of B
Term Offered: Spring

NURS 6004 Professional Nurse Competency
[2 credit hours]
Focus on preparation for the National council Licensure Examination for Registered Nurses NCLEX-RN, through content review and test-taking practice.
Prerequisites: NURS 5000 with a minimum grade of B and NURS 5001 with a minimum grade of B and NURS 5002 with a minimum grade of B and NURS 5003 with a minimum grade of B and NURS 5004 with a minimum grade of B and NURS 5005 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5007 with a minimum grade of B and NURS 5008 with a minimum grade of B and NURS 5009 with a minimum grade of B and NURS 5530 with a minimum grade of B and NURS 5910 with a minimum grade of B and NURS 6001 with a minimum grade of B and NURS 6002 with a minimum grade of B and INDI 6000 with a minimum grade of B
Corequisites: NURS 6003
Term Offered: Spring

NURS 6060 Psychopharmacology for PMHNP Practice
[2 credit hours]
An introductory psychopharmaceutical course for PMHNP students.
Corequisites: NURS 5690
Term Offered: Spring, Fall

NURS 6150 Contemporary Practice
[3 credit hours]
Focuses on broad concepts relevant to current nursing practice, including role development, communication with teams and as a leader and with patients and families. Billing, coding, entrepreneurship, marketing, and other aspects of advanced practice are incorporated.
Term Offered: Spring

NURS 6230 Family Nurse Practitioner Clinical III: Primary Care of Adults and Older Adults
[8 credit hours]
Focuses on primary care management of acute and chronic conditions of adults and older adults. Urgent care issues are addressed. Emphasizes integration of primary care concepts across the life span. Includes 240 clinical hours.
Prerequisites: NURS 6220 with a minimum grade of B
Term Offered: Spring

NURS 6240 Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults
[3 credit hours]
This course provides the didactic foundation to guide the acute and chronic condition management of late adolescents and young adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Term Offered: Summer, Fall

NURS 6250 Advanced Practice Nursing in Acute Care of Late Adolescents and Young Adults: Practicum 1
[4 credit hours]
Practicum 1 focuses on the management of acute illnesses in diverse populations of late adolescents and young adult patients.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6240
Term Offered: Summer, Fall

NURS 6260 Advanced Practice Nursing in Acute Care of Adults and Older Adults
[3 credit hours]
The course focuses on care of chronic, acute, and complex illnesses in adults and older adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Term Offered: Spring, Fall

NURS 6270 Advanced Practice Nursing in Acute Care of Adults and Older Adults: Practicum 2
[4 credit hours]
This course provides the didactic foundation to guide the acute-and chronic-condition management of late adolescents and young adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6260
Term Offered: Spring, Fall

NURS 6280 Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults
[2 credit hours]
The course focuses on care of chronic, acute, and complex illnesses in Older Adults and Frail Elderly.
Corequisites: NURS 6650
Term Offered: Spring, Fall

NURS 6290 Advanced Practice Nursing in Acute Care of Older Adults and Frail Adults: Practicum 3
[5 credit hours]
Practicum focuses on the management of acute illnesses in diverse populations of older adults and frail elderly.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6280
Term Offered: Spring, Fall

NURS 6340 Advanced Practice Nursing in Psych Mental Health of Adults
[3 credit hours]
Focuses on the theory related to the primary care of acute and chronic psych mental health issues in adults and principles of health promotion and wellness.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 6060 with a minimum grade of B
Term Offered: Summer

NURS 6350 Advanced Practice Nursing in Psych Mental Health of Adults: Practicum 1
[4 credit hours]
Focus on primary care of acute and chronic psych mental health issues in adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 6060 with a minimum grade of B
Corequisites: NURS 6340
Term Offered: Summer

NURS 6360 Advanced Practice Nursing in Primary Care of Psych Mental Health of Child, Adolescent and Family
[3 credit hours]
Focus on primary care of acute and chronic psych mental health issues in children, adolescent, and families.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 6060 with a minimum grade of B
Term Offered: Fall

NURS 6370 Advanced Practice Nursing in Psych Mental Health of Child, Adolescent and Family: Practicum 2
[4 credit hours]
Focus on primary care of acute and chronic psych mental health issues in children, adolescents, and families.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 6060 with a minimum grade of B
Corequisites: NURS 6360
Term Offered: Fall

NURS 6380 Advanced Practice Nursing in Psych Mental Health of Older Adults
[2 credit hours]
Focus on primary care of acute and chronic psych mental health issues in older adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6060 with a minimum grade of B
Corequisites: NURS 6650
Term Offered: Spring

NURS 6390 Advanced Practice Nursing in Psych Mental Health of Older Adults: Practicum 3
[5 credit hours]
Focus on primary care of acute and chronic psych mental health issues in older adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 6750 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6060 with a minimum grade of B
Corequisites: NURS 6380
Term Offered: Spring

NURS 6420 Acute Care Nurse Practitioner Clinical I: Acute Management of Late Adolescents and Young Adults
[8 credit hours]
The purpose of this course is to provide students with a strong foundation in clinical decision-making, role development, and procedural skills in the acute care management of diverse populations of late adolescents and young adult patients.
Prerequisites: (NURS 5400 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5740 with a minimum grade of B and INDI 6000 with a minimum grade of C) or (NURS 7400 with a minimum grade of B and NURS 7680 with a minimum grade of B and NURS 7740 with a minimum grade of B or NURS 7170 with a minimum grade of B and NURS 7690 with a minimum grade of B and INDI 8000 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

NURS 6430 Acute Care Nurse Practitioner Clinical II: Acute Management of Adults and Older Adults
[7 credit hours]
The purpose of this course is to integrate evidence-based clinical knowledge in diagnosing and acute care management of adults and older adults with complex, acute and chronic conditions.
Prerequisites: NURS 6420 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 6440 Acute Care Nurse Practitioner Clinical III: Acute Management of Older Adults and Frail Elderly
[8 credit hours]
The purpose of this course is to utilize evidence-based knowledge and advanced clinical skills in diagnosing and managing older adults and frail elderly with complex acute and chronic conditions.
Prerequisites: NURS 6430 with a minimum grade of B
Term Offered: Spring, Fall

NURS 6530 Public Policy and Health Care
[3 credit hours]
Focus on emerging trends in healthcare policy and includes content on ethical foundations, financial implications, and engagement of graduate level nurses in the development, implementation, and evaluation of healthcare policy.
Term Offered: Spring, Summer, Fall

NURS 6540 Advanced Practice Nursing in Primary Care of Adults
[3 credit hours]
Focus on primary care of common acute and chronic illnesses in adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Term Offered: Summer

NURS 6550 Advanced Practice Nursing in Primary Care of Adults: Practicum 1
[4 credit hours]
Practicum 1 focuses on primary care of acute and chronic illnesses in adults.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6540
Term Offered: Summer, Fall

NURS 6560 Advanced Practice Nursing in Primary Care of Families
[3 credit hours]
Focuses on the care of children, adolescents, and women across the lifespan. Emphasis is on health promotion and common acute illness.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 6750 with a minimum grade of B
Term Offered: Fall

NURS 6570 Advanced Practice Nursing in Primary Care of Families: Practicum 2
[4 credit hours]
Focus on primary care of common acute and chronic illnesses in children and women across the lifespan. Practicum experiences will incorporate women, children, adults, and target populations.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6560
Term Offered: Fall

NURS 6580 Advanced Practice Nursing in Primary Care of Older Adults
[2 credit hours]
Focuses on primary-care management of acute and chronic conditions of adults and older adults. Urgent-care issues are addressed. Emphasizes integration of primary-care concepts across the life span.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6650
Term Offered: Spring

NURS 6590 Advanced Practice Nursing in Primary Care of Older Adults: Practicum 3
[5 credit hours]
Focus on primary care of common acute and chronic illnesses in adults and older adults. Practicum experiences will incorporate adults and target populations.
Prerequisites: NURS 6740 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 6750 with a minimum grade of B
Corequisites: NURS 6580
Term Offered: Spring

NURS 6610 Population Health for Advanced Practice Nurses
[3 credit hours]
Focus on broad concepts relevant to current advanced practice nursing, including impact of changing demographics on healthcare delivery systems, cultural assessment and competence, the social determinants of health, and social justice.
Term Offered: Spring, Summer, Fall

NURS 6650 Transition to Practice
[1 credit hour]
Focus on broad concepts relevant to current nursing practice, including role development, communication with teams and as a leader and with patients and families. Billing, coding, entrepreneurship, marketing and other aspects of advanced practice are incorporated.
Term Offered: Spring

NURS 6740 Advanced Assessment
[3 credit hours]
Focuses on acquisition of advanced skills in collection and documentation of assessment data across the life span. Differentiates normal from abnormal findings. Supervised practice and demonstrations are required.
Prerequisites: NURS 5680 with a minimum grade of B
Corequisites: NURS 6750
Term Offered: Spring

NURS 6750 Diagnostic Reasoning
[1 credit hour]
Focus on development of hypotheses that may explain an individual's clinical problem and how to apply collected information in confirming or excluding a hypothesis and generating a list of differential diagnoses.
Corequisites: NURS 6740
Term Offered: Spring

NURS 6760 Population Health Nursing: Policy, Advocacy, and Health Systems
[3 credit hours]
Focus on exploring population health nursing within the context of health policy, advocacy, and health systems. Students examine how public policy, healthcare delivery structures, and social and structural determinants influence population health outcomes. Emphasis is placed on systems-based practice, health equity, and the professional nurse's role in advocacy, policy engagement, and leadership to promote safe, effective, and equitable care across populations and lifespans.
Term Offered: Fall

NURS 6770 Health Assessment and Nursing Skills 1
[5 credit hours]
Focus on holistic assessment of diverse populations across the lifespan. Emphasis on the application of knowledge and skills through experiential and interprofessional activities, while laying the foundation for scholarly inquiry.
Term Offered: Fall

NURS 6780 Professional Socialization in Nursing
[2 credit hours]
Understanding of the professional nursing role including historical, legal, ethical, political, economic, and cultural diversity that impact nursing practice. Examine nursing theories and models of professional nursing practice.
Term Offered: Fall

NURS 6790 Nursing Care of Adults 1
[6 credit hours]
Focus on health promotion, prevention, and disease management using evidence-based practice with an emphasis on utilizing the nursing process to deliver care across the lifespan of adults.
Prerequisites: NURS 5002 with a minimum grade of B and NURS 6770 with a minimum grade of B
Term Offered: Spring

NURS 6800 Pharmacology 1 for the Graduate Entry Nurse
[2 credit hours]
Introduction to foundational pharmacologic principles essential to safe nursing practice, including pharmacokinetics, pharmacodynamics, mechanisms of action, adverse effects, and drug interactions. Emphasis is placed on life-span considerations, regulatory standards, and application of pharmacology to clinical judgment and client safety.
Prerequisites: NURS 5002 with a minimum grade of B and NURS 6770 with a minimum grade of B
Term Offered: Spring, Summer

NURS 6810 Pharmacology II for the Graduate Entry Nurse
[2 credit hours]
Building on foundational pharmacology introduced in NURS6800, this course advances the application of pharmacotherapeutic principles through clinical judgment. Emphasis is placed on evaluating therapeutic outcomes, managing high-risk medications, and preventing adverse drug events to promote client safety.
Prerequisites: NURS 6800 with a minimum grade of B and NURS 6770 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5002 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 6820 Evidence-Based Practice: Translating Research to Practice
[3 credit hours]
Focus is on the use of evidence-based literature and research to inform clinical decision-making, enhance care, and improve outcomes.
Term Offered: Spring, Summer, Fall

NURS 6830 Nursing Care of Adults II
[6 credit hours]
Focus on disease management and care of clients with complex health problems using evidence-based practice with an emphasis on utilizing the nursing process to deliver care across the lifespan of adults.
Prerequisites: NURS 5002 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 6770 with a minimum grade of B and NURS 6790 with a minimum grade of B and NURS 6800 with a minimum grade of B and NURS 6810 with a minimum grade of B
Term Offered: Fall

NURS 6840 Transition to Professional Nursing Practice
[5 credit hours]
Emphasis is placed on the synthesis of prior coursework and knowledge as students assume the role of the entry-level nurse. Students develop increasing independence in nursing practice, strengthen clinical reasoning skills, and demonstrate accountability for autonomous professional practice. The course emphasizes the application of management and leadership principles within clinical settings, preparing students to demonstrate entry-level nursing leadership, decision-making, and professional responsibility in client care and healthcare systems.
Prerequisites: NURS 5002 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5008 with a minimum grade of B and NURS 5009 with a minimum grade of B and NURS 6760 with a minimum grade of B and NURS 6770 with a minimum grade of B and NURS 6780 with a minimum grade of B and NURS 6790 with a minimum grade of B and NURS 6800 with a minimum grade of B and NURS 6810 with a minimum grade of B and NURS 6820 with a minimum grade of B and NURS 6830 with a minimum grade of B
Corequisites: NURS 6850
Term Offered: Spring

NURS 6850 RN Practice Readiness and NCLEX Review
[2 credit hours]
Focus on preparation for the National council Licensure Examination for Registered Nurses NCLEX-RN, through content review and test-taking practice.
Prerequisites: NURS 5002 with a minimum grade of B and NURS 5006 with a minimum grade of B and NURS 5008 with a minimum grade of B and NURS 5009 with a minimum grade of B and NURS 6760 with a minimum grade of B and NURS 6770 with a minimum grade of B and NURS 6780 with a minimum grade of B and NURS 6790 with a minimum grade of B and NURS 6800 with a minimum grade of B and NURS 6810 with a minimum grade of B and NURS 6820 with a minimum grade of B and NURS 6830 with a minimum grade of B
Corequisites: NURS 6840
Term Offered: Spring

NURS 6860 Graduate Entry Master's Nursing Capstone: Practice Integration
[1-2 credit hours]
A culminating course enables students to synthesize and apply program knowledge through the completion of a capstone project. Emphasis is on critical thinking, problem-solving, research literacy, teamwork, planning, and professional oral and written communication.
Prerequisites: NURS 6820 (may be taken concurrently) with a minimum grade of B and NURS 6860 (may be taken concurrently) with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 6890 Independent Study in Nursing
[1-4 credit hours]
The student and faculty member agree on a course of study that will enable the student to achieve his/her objectives. An Independent Study Contract and Evaluation Form are submitted to the Associate Dean of the Graduate Nursing Program. May be repeated for credit.
Term Offered: Spring, Summer, Fall

NURS 6910 Nursing Research and Practice Application
[3 credit hours]
Focus is on critically exploring research processes that generate new knowledge and informs nursing practice. Data-based literature will be evaluated to identify conceptual framework, explain statistical applications, and differentiate research methods. Appraisal of provisions to protect human subjects including completion of CITI training.
Prerequisites: INDI 6000 with a minimum grade of C
Term Offered: Spring, Summer, Fall

NURS 6990 Thesis Research
[1-3 credit hours]
Research in nursing to fulfill the research requirement of the Nursing Master's Program. The (required) 3 credit hours may be divided and repeated across semesters. Only 3 credit hours are applicable for the degree. May be repeated for credit.
Term Offered: Spring, Summer, Fall

NURS 7011 Implementation Science for Evidence-Based Practice
[3 credit hours]
This 3-credit course examines the inter-relationship between theory, research, and practice along with the nature of scientific knowledge development in nursing. Focus is on critical analysis and evaluation of theory and its use for designing evidence-based practice protocols.
Prerequisites: NURS 7400 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 7050 Information and Technology in Nursing and Health Care Systems
[3 credit hours]
Systematic assessment of clinical and administrative information needs of health care systems. Examines the technology and strategies needed to support patients, nurses, and health care delivery in dynamic environmental systems.
Term Offered: Spring, Fall

NURS 7060 Population Health
[3 credit hours]
This course uses epidemiologic models to analyze interventions for health care-delivery systems. The focus is on safe, ethical, equitable and culturally-appropriate advanced nursing practice activities to meet emerging world needs for population health.
Prerequisites: INDI 6000 with a minimum grade of B or INDI 8000 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 7110 DNP Anesthesia Residency I
[2 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge with experiential learning in simulated and real clinical environments
Term Offered: Spring

NURS 7120 DNP Anesthesia Residency II
[3 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "novice" anesthesia student for the care of the patient with minimal to no physiological derangements (PS I & IE).
Term Offered: Summer

NURS 7130 DNP Anesthesia Residency III
[3 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "advanced beginner" anesthesia student for the care of the more complex patients who may present emergently (PS II & IIE).
Term Offered: Fall

NURS 7140 DNP Anesthesia Residency IV
[4 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "competent" anesthesia student for the care of the functionally incapacitated emergent, moribund and special population and specialty procedures' patients (PS III & IIIE).
Prerequisites: NURS 7130 with a minimum grade of C
Term Offered: Summer

NURS 7150 DNP Anesthesia Residency V
[4 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "competent" anesthesia student for the care of emergent, moribund, declared brain death patient for organ harvest and special population and specialty procedures' patients (PS IV & IVE).
Prerequisites: NURS 7140 with a minimum grade of C
Term Offered: Summer

NURS 7160 DNP Anesthesia Residency VI
[4 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "proficient" anesthesia student for the care of emergent, moribund, declared brain death patient for organ harvest and special population and specialty procedures' patients (PS V, VE, & VI).
Term Offered: Fall

NURS 7170 Advanced Health Assessment for the DNP
[4 credit hours]
Focuses on acquisition of advanced skills in collection and documentation of assessment data across the life span. Differentiates normal from abnormal findings. Supervised laboratory practice is required.
Prerequisites: NURS 7680 with a minimum grade of B
Term Offered: Spring, Summer

NURS 7190 DNP Anesthesia Residency VII
[4 credit hours]
The course focuses on integration of scientific, best practices, and safety and quality theoretical knowledge to psychomotor skills, clinical judgment, and problem-solving by the "expert" anesthesia student for patients across the lifespan, special populations, and procedures.
Prerequisites: NURS 7160 with a minimum grade of C
Term Offered: Spring

NURS 7200 Transformational and Systems Leadership for the DNP
[3 credit hours]
This course examines the application of organizational and leadership theories and strategies to assess process and outcomes in a variety of health care settings. Focus is on the role of the advanced practice nurse in analyzing clinical patterns and issues in complex practice settings, health care organizations and communities.
Term Offered: Spring, Summer, Fall

NURS 7210 Family Nurse Practitioner Clinical I: Primary Care of Adolescents and Adults
[7 credit hours]
Focuses on primary care of common/chronic illness of adolescents, adults includes beginning understanding of role of APN in primary care includes development of therapeutic relationships. Clinical experiences include populations across the lifespan.
Prerequisites: NURS 7680 with a minimum grade of B and NURS 7400 with a minimum grade of B and (NURS 7740 with a minimum grade of B or NURS 7170 with a minimum grade of B)
Corequisites: NURS 7690
Term Offered: Summer

NURS 7220 Family Nurse Practitioner Clinical II: Primary Care of Women and Children
[7 credit hours]
Focuses on primary care of children/women's health. Emphasis on health promotion and common acute illness, role development,
Prerequisites: NURS 7210 with a minimum grade of B and NURS 7690 with a minimum grade of B
Term Offered: Fall

NURS 7230 Family Nurse Practitioner Clinical III: Primary Care of Adults and Older Adults
[8 credit hours]
Focuses on primary care management of acute/chronic conditions of adults/older adults. Urgent care issues are addressed. Emphasizes holistic care across the lifespan integrating primary care concepts. Explores professional APN leadership role.
Prerequisites: NURS 7220 with a minimum grade of B
Term Offered: Spring, Fall

NURS 7240 Quality, Safety and Advocacy Strategies
[3 credit hours]
Examines the principles and practice of quality management in health care organizations and clinical performance in care delivery and outcomes. Focus is on the role and accountability of the DNP prepared nurse working with a collaborative team for maintaining safety, and improving quality of care.
Term Offered: Spring, Summer, Fall

NURS 7250 Foundational Principles of Quality Improvement and Data Management for Leading Change
[3 credit hours]
Quality Improvement (QI) models and tools provide the foundation for quality improvement activities. Clinical Data Management strategies as a part of Nursing Informatics application are used as core skills to assess clinical processes and outcomes for areas of improvement.
Term Offered: Fall

NURS 7260 Principles for DNP Anesthesia 1
[3 credit hours]
The course focus is on biomedical technology – anesthesia delivery and airway equipment, physiologic monitoring, utilization and interpretation of data in clinical practice.
Term Offered: Fall

NURS 7270 Advanced Pharmacology for APRNs
[4 credit hours]
The course focus is the in-depth analysis of pharmacological precepts for clinical correlation and therapeutic pharmacologic decision-making.
Term Offered: Spring

NURS 7290 Advanced Health Assessment and Diagnostic Reasoning
[3 credit hours]
The course focuses on analysis and interpretation of assessment and diagnostic methodologies of advanced practice nursing across the lifespan.
Term Offered: Spring

NURS 7300 Advanced Physiology and Pathophysiology Across the Lifespan II
[3 credit hours]
The course focus is analysis of specific normal and abnormal human physiology for health promotion and clinical and therapeutic decision making across the lifespan
Prerequisites: NURS 7590 with a minimum grade of C
Term Offered: Spring, Summer

NURS 7340 Scientific Foundations for Anesthesia
[3 credit hours]
The course focus is on chemical, biochemical, and physics that are pertinent to human physiology, pharmacology, and biomedical equipment.
Term Offered: Summer

NURS 7350 Principles for DNP Anesthesia II
[3 credit hours]
The course focus is on the use of biomedical technology and equipment in perioperative anesthesia management, utilization and interpretation of data for safe, evidence-based care in select human normal and abnormal physiologic states for medical, surgical and diagnostic interventions .
Term Offered: Spring

NURS 7360 Advocacy and Social Policy
[3 credit hours]
This course focuses on the knowledge, skills and significance of advocacy, health policy, and health law at the local, state, national, and international levels. It includes the process of health policymaking, the impact of health policy on the health of citizens, and the role of nursing and of advanced practice nurses in the political process
Term Offered: Summer

NURS 7370 Evidence-based Practice for Advanced Nursing Practice
[3 credit hours]
This course explores advanced nursing research skills from theory to practice. The student learns how to plan, design, implement, analyze, and report nursing research that translates to advanced nursing practice. Applicable nursing research designs are examined and research methodologies are appraised for appropriateness for clinical practice. The role of the advanced practice nurse for project development in interprofessional collaboration to improve health system outcomes is explored. The course culminates with an integrative review of the literature for an identified practice problem.
Term Offered: Summer

NURS 7380 Population Health for Advanced Nursing Practice
[3 credit hours]
This course covers the fundamental elements of population health, population health management strategies, as the core understanding required for addressing health equity and disparities, social determinants of health, public health issues, and policy advocacy needed by nursing leaders. Additionally, students will apply key steps of a population health model related to conducting an assessment, intervention, and evaluation of individuals and populations. This course includes a minimum of 20 field hours.
Term Offered: Summer

NURS 7390 Principles for DNP Anesthesia III
[5 credit hours]
The course focuses on safe, evidence-based anesthesia care in select human normal and abnormal physiologic states for select medical, surgical, and diagnostic interventions.
Prerequisites: NURS 7350 with a minimum grade of C
Term Offered: Summer

NURS 7400 Theoretical Foundations of Advanced Nursing Practice
[2 credit hours]
Explores nursing as science and art. Identifies practice theory in the context of the nursing metaparadigm, grand and middle range theory with emphasis on analysis/evaluation of selected nursing theories.
Term Offered: Spring, Summer, Fall

NURS 7420 Acute Care Nurse Practitioner Clinical I: Acute Management of Late Adolescents and Young Adults
[8 credit hours]
The purpose of this course is to provide students with a strong foundation in clinical decision-making, role development, and procedural skills in the acute care management of diverse populations of late adolescents and young adult patients.
Prerequisites: (NURS 5400 with a minimum grade of B and NURS 5680 with a minimum grade of B and NURS 5690 with a minimum grade of B and NURS 5740 with a minimum grade of B and INDI 6000 with a minimum grade of C) or (NURS 7400 with a minimum grade of B and NURS 7680 with a minimum grade of B and NURS 7740 with a minimum grade of B or NURS 7170 with a minimum grade of B and NURS 7690 with a minimum grade of B and INDI 8000 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

NURS 7430 Acute Care Nurse Practitioner Clinical II: Acute Management of Adults and Older Adults
[7 credit hours]
The purpose of this course is to integrate evidence-based clinical knowledge in diagnosing and acute care management of adults and older adults with complex, acute and chronic conditions.
Prerequisites: NURS 6420 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 7440 Acute Care Nurse Practitioner Clinical III: Acute Management of Older Adults and Frail Elderly
[8 credit hours]
The purpose of this course is to utilize evidence-based knowledge and advanced clinical skills in diagnosing and managing older adults and frail elderly with complex acute and chronic conditions.
Prerequisites: NURS 6430 with a minimum grade of B
Term Offered: Spring, Fall

NURS 7450 Regional Anesthesia and Pain Management
[4 credit hours]
The course focuses on safe, evidence-based care management in regional anesthesia, acute and chronic pain states, radiological and ultrasonography principles, and best practices in nonoperating room anesthesia experiences.
Term Offered: Fall

NURS 7460 Epidemiology
[3 credit hours]
Epidemiological principles and biostatistical methods used in the study of disease patterns are further examined. Methods are applied in the development, implementation, and evaluation of preventive healthcare services in diverse settings. Students investigate, describe, and determine causal inferences involving the distribution and determinants of morbidity and mortality. Epidemiological and statistical data are used to develop and improve healthcare delivery models for diverse population health and acute care settings.
Term Offered: Summer

NURS 7470 Principles for DNP Anesthesia IV
[3 credit hours]
The course focuses on safe, evidence-based anesthesia care in special populations' normal and abnormal physiologic states for select specialty medical, surgical, and diagnostic interventions.
Prerequisites: NURS 7390 with a minimum grade of C
Term Offered: Fall

NURS 7480 DNP NAP Project 1-Problem Identification and Literature Review
[3 credit hours]
Quality Improvement (QI) models and tools provide the foundation for quality improvement activities. Clinical Data Management strategies as a part of Nursing Informatics application are used as core skills to assess clinical processes and outcomes for areas of improvement.
Term Offered: Fall

NURS 7490 DNP NAP Project 2- Project Planning
[2 credit hours]
This online course prepares DNP students at the University of Toledo to design a rigorous translational research / evidence-based practice (EBP) project for later implementation in NURS 75205 Translational Research Project Implementation. Students identify a clinically significant practice problem, synthesize current evidence, select an appropriate theoretical or implementation framework, and develop a detailed project proposal that includes purpose, aims, methods, outcome measures, data plan, stakeholder engagement, and ethical/regulatory considerations. Successful completion results in an approved DNP project plan ready for implementation in a subsequent semester.
Prerequisites: NURS 7480 with a minimum grade of C
Term Offered: Spring

NURS 7520 DNP NAP Project 3-Implementation
[2 credit hours]
This course provides the opportunity for the student to implement and evaluate the translational research project that was planned and designed in the Translational Research Design course. This final project demonstrates synthesis of the knowledge gained throughout the DNP curriculum and lays the foundation for future scholarship in practice. Practice hours may be assigned to the scholarly project for the purpose of implementation and evaluation
Prerequisites: NURS 7490 with a minimum grade of C
Term Offered: Summer

NURS 7530 Public Policy and Health Care
[3 credit hours]
Explores the public policy process from agenda setting through program evaluation. Focus is on how health problems are brought to the attention of government and solutions are obtained. Some field work is expected.
Term Offered: Spring, Summer, Fall

NURS 7540 Advanced Pharmacology for Anesthesia
[4 credit hours]
The course focus is the in-depth analysis of pharmacological precepts for clinical correlation and therapeutic pharmacologic decision-making.
Term Offered: Fall

NURS 7550 NAP Project 4- DNP NAP Project 4 Evaluation and Dissemination
[3 credit hours]
This course reflects the culmination and synthesis of learning across the DNP program through the dissemination of the DNP scholarly project that was designed and implemented in previous DNP coursework. The student is required to present the project in a public forum.
Prerequisites: NURS 7520 with a minimum grade of C
Term Offered: Fall

NURS 7560 Synthesis of Critical Anesthesia Concepts I
[2 credit hours]
The course focus is synthesis of critical professional and practice concepts for progression into independent nurse anesthesia practice as one who accepts the duty of current practice knowledge and lifelong learning.
Term Offered: Fall

NURS 7570 Advanced Human Anatomy
[3 credit hours]
The course focus is on the structure and organization of the human body as a scientific foundation for clinical practice application.
Term Offered: Fall

NURS 7580 Synthesis of Critical Anesthesia Concepts II
[2 credit hours]
The course focus is synthesis of critical professional and practice concepts for progression into independent nurse anesthesia practice as one who accepts the duty of current practice knowledge and lifelong learning
Prerequisites: NURS 7560 with a minimum grade of C
Term Offered: Spring

NURS 7590 Advanced Physiology and Pathophysiology Across the Lifespan I
[3 credit hours]
The course focus is analysis of specific normal and abnormal human physiology for health promotion and clinical and therapeutic decision making across the lifespan
Term Offered: Fall

NURS 7610 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adult
[7 credit hours]
The first course in the Psychiatric-Mental Health Nurse Practitioner track focuses on preparing the student in the advanced practice role of assessment, diagnosis, and treatment planning of select acute and chronic psychiatric disorders and mental health care needs of individuals across the lifespan. Students will be introduced to clinical approaches and methods for assessing and evaluating adults.
Prerequisites: NURS 7050 with a minimum grade of B and NURS 7400 with a minimum grade of B and NURS 7680 with a minimum grade of B and (NURS 7740 with a minimum grade of B or NURS 7170 with a minimum grade of B)
Corequisites: NURS 7690
Term Offered: Summer

NURS 7620 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical II Child, Adolescent, Family
[7 credit hours]
Emphasis on increasing ability to assess, diagnose, and treat more complex mental health care needs of individuals and families with particular attention paid to those disorders found in childhood and adolescence.
Prerequisites: NURS 7610 with a minimum grade of B and NURS 7690 with a minimum grade of B
Term Offered: Fall

NURS 7630 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adult
[9 credit hours]
Focus on acute or chronic psychiatric or mental health issues faced by older adults and their families- dementia, delirium, and depression.
Prerequisites: NURS 7610 with a minimum grade of B and NURS 7620 with a minimum grade of B
Term Offered: Spring, Fall

NURS 7680 Advanced Physiology and Pathophysiology
[3 credit hours]
Focuses on advanced physiologic and pathophysiologic mechanisms underlying human responses to illness across ther life-span. Students will build on existing knowledge of human anatomy and physiology.
Term Offered: Spring, Fall

NURS 7690 Advanced Pharmacotherapeutics
[3 credit hours]
Focuses on advanced pharmacologic principles in decision making for pharmacotherapy. Emphasizes physiological responses to drugs, expected outcomes, adverse reactions, and potential drug interactions. Discusses professional responsibilities of prescriptive privileges.
Prerequisites: NURS 7680 with a minimum grade of B
Term Offered: Spring, Fall

NURS 7710 Advanced Pediatric Pharmacotherapeutics
[1 credit hour]
Focuses on advanced pharmacologic principles in pediatric pharmacotherapy decision making for the advanced practice as a primary care pediatric nurse practitioner. The focus in on principles of pharmacokinetics, pharmacodynamics, and evidence-based pharmacotherapeutics for the care of infants, children, adolescents, young adults.
Corequisites: NURS 7690
Term Offered: Fall

NURS 7720 Advanced Pediatric Physiology and Pathophysiology
[1 credit hour]
This course provides a scientific foundation for advanced practice as a primary care pediatric nurse practitioner. The focus in on developmental physiology and pathophysiology of infants, children, adolescents, young adults. The embryology of organs and systems of the body will be discussed from conception through birth. Alterations in the function of organs and systems of the body affecting the pediatric population will be presented.
Corequisites: NURS 7680
Term Offered: Fall

NURS 7730 Advanced Pediatric Health Assessment
[3 credit hours]
This course provides the foundation for advanced assessment skills required to practice as a primary care pediatric nurse practitioner. The focus in on the health assessment of infants, children, adolescents, young adults, and their families. A comprehensive, holistic, and developmental approach to advanced practice will focus on the specific knowledge and skills required when conducting pediatric history and physical examinations.
Term Offered: Spring

NURS 7810 Pediatric Nurse Practitioner Clinical I:Care of Children and Concepts of Wellness
[6 credit hours]
Health care for children/adolescents, principles of health promotion/wellness. Understanding of APN role in primary care, development of therapeutic relationships. Competencies in primary care for children from birth to 21 years and families.
Prerequisites: NURS 7400 with a minimum grade of B and NURS 7680 with a minimum grade of B and (NURS 7740 with a minimum grade of B or NURS 7170 with a minimum grade of B)
Corequisites: NURS 7690
Term Offered: Spring, Summer

NURS 7820 Pediatric Nurse Practitioner Clinical II: Common Acute, and Stable Chronic Illnesses
[7 credit hours]
Care of children/adolescents with an emphasis on the management of common acute and stable chronic illnesses and APN role development. Includes therapeutic communication skills development with individuasls and groups.
Prerequisites: NURS 7810 with a minimum grade of B and NURS 7690 with a minimum grade of B
Term Offered: Fall

NURS 7830 Pediatric Nurse Practitioner Clinical III: Complex Chronic Illnesses or Disabilities
[7 credit hours]
Management of complex acute/chronic conditions in children/adolescents. Holistic care for children and families including developmental concerns and disability. Explores APN leadership role. Integration of the advanced practice role.
Prerequisites: NURS 7820 with a minimum grade of B
Term Offered: Spring

NURS 7890 Independent Study
[1-4 credit hours]
An individualized academic course that is completed under supervision of a faculty member and requires approval by the Program Director. Prior to enrollment, the student and supervising faculty member will establish agreed upon learning objectives, activities, and evaluation criteria, which are documented in the course syllabus and acknowledged through required signatures.
Term Offered: Spring, Summer, Fall

NURS 7910 Advanced Research for Evidence Based Nursing Practice
[3 credit hours]
Critically evaluate published research for clinical relevance, identify a research problem, select a conceptual framework, review selected literature, and prepare a quantitative or qualitative research proposal.
Prerequisites: (NURS 5400 with a minimum grade of B and INDI 6000 with a minimum grade of C) or (NURS 7400 with a minimum grade of B and INDI 8000 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

NURS 8010 Proposal/Practicum DNP Project 1
[5 credit hours]
First of three DNP project courses to prepare student to develop a project proposal for defense.
Prerequisites: NURS 7400 with a minimum grade of B and NURS 7910 with a minimum grade of B and INDI 8000 with a minimum grade of B and NURS 7011 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 8020 Implementation/Practicum DNP Project 2
[5 credit hours]
Advance the scholarship of nursing through the implementation of a rigorous DNP project including the interpretation, analysis, and application of evidence-based practice to improve health outcomes of a focused population.
Prerequisites: NURS 8010 with a minimum grade of S
Term Offered: Spring, Summer, Fall

NURS 8030 Implementation/Practicum DNP Project 3
[5 credit hours]
Provide analysis and evaluation of strategies that facilitate knowledge dissemination in clinical and academic settings. Facilitate the student developing two scholarly manuscripts and a scholarly presentation of their DNP project.
Prerequisites: NURS 8020 with a minimum grade of S
Term Offered: Spring, Summer, Fall

NURS 8210 Management and Leadership Skills for the DNP Nurse Executive
[6 credit hours]
This course builds on core DNP leadership and management skills by focusing on the professional role of the nurse executive including their leadership potential in context of healthcare reform and transformation.
Prerequisites: NURS 7400 with a minimum grade of B and NURS 7910 with a minimum grade of B and NURS 7011 with a minimum grade of B and NURS 7530 with a minimum grade of B and NURS 7050 with a minimum grade of B and INDI 8000 with a minimum grade of B and NURS 7060 with a minimum grade of B and NURS 7200 with a minimum grade of B and NURS 7240 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 8220 Business Skills for the DNP Nurse Executive
[6 credit hours]
This course is designed to teach essential business skills necessary for the nurse executive. Business skills include financial management, human resource management strategic management, and information management and technology.
Prerequisites: NURS 8210 with a minimum grade of B
Term Offered: Spring, Summer, Fall

NURS 8230 Entrepreneurship Seminar for the DNP Nurse Executive
[6 credit hours]
This seminar is designed to teach entrepreneurial critical thinking skills for the identification and resolution of business problems in the healthcare setting. The course includes the design of a business plan.
Prerequisites: NURS 8220 with a minimum grade of B
Term Offered: Spring, Summer, Fall

Occupational Therapy (OCCT)

OCCT 7000 Foundations of Occupational Therapy
[3 credit hours]
This course introduces students to the history, philosophy, core concepts, ethics, and the domain and process of occupational therapy. Students also explore the basic tenets of therapeutic occupation and investigate the role that chosen occupations play within an individual's daily life. Professional skills in occupational analysis and professional communication are introduced and applied. Students also complete concurrent lab experiences with students from other health care professions as part of the university-wide Interprofessional Education Program. Prerequisite: Admission to OTD Program
Term Offered: Fall

OCCT 7010 OT Models of Practice I
[5 credit hours]
Examines the biomechanical model of practice including its musculoskeletal and kinesiological foundations. Includes assessments and interventions for prevention, adaptation, and compensation. Prerequisite: Admission to OTD Program
Term Offered: Fall

OCCT 7020 OT Models of Practice II
[5 credit hours]
An introduction to the nervous system, with emphasis on the neurological basis of human occupation and the effects of neurological conditions (disease, injury, and mental illness) on occupational performance. Explores neuroplasticity and neuro rehabilitation. Labs include neuroanatomy and clinical assessment. Prerequisite: Occupational Therapy Models of Practice I Co-requisite: Occupational Therapy Models of Practice III
Term Offered: Spring

OCCT 7030 OT Models of Practice III
[4 credit hours]
Explores historical and alternative conceptual frameworks of occupation and therapeutic occupation. Examines cognitively based and general models of practice. Presents related assessments and interventions for prevention, adaptation, and compensation. Prerequisite: Occupational Therapy Models of Practice I Co-requisite: Occupational Therapy Models of Practice II
Term Offered: Spring

OCCT 7040 OT Models of Practice IV
[5 credit hours]
Focuses on the occupational therapy process and models of practice for intervention with children and individuals with neurological impairments, including assessment and intervention. Prerequisite: Occupational Therapy Models of Practice II
Term Offered: Summer

OCCT 7110 OT Research I: Evidenced-Informed Practice
[4 credit hours]
Introduction to the principles of measurement and research design, with an emphasis on critically evaluating the design of research studies relevant to clinical practice. Examines quantitative and qualitative research methodologies. Introduces students to the OTD Scholarly Project.
Term Offered: Fall

OCCT 7120 OT Research II: Scholarly Project Proposal
[2 credit hours]
Provides structure for student, guided by faculty advisor, to define a research question, investigate the literature, explore the site(s) for data collection, and create a research proposal for their scholarly project.
Term Offered: Spring, Summer, Fall

OCCT 7130 OT Research III: Scholarly Project Implementation
[2 credit hours]
Provides structure for student to implement their scholarly project following approved methods.
Prerequisites: OCCT 7120 with a minimum grade of C
Term Offered: Spring, Summer, Fall

OCCT 7210 OT Advocacy I: Education in Healthcare
[2 credit hours]
Explores the role of occupational therapist as educator. Examines educational theory, instructional methods and technology, and evaluation of teaching effectiveness with patients, families, peers, supervisees, and community groups.
Term Offered: Fall

OCCT 7220 OT Advocacy II: Community & Academic Education
[2 credit hours]
Applies teaching principles as students assume the role of educators to the community. Explores the role of the therapist in design, development, implementation, and evaluation of occupational therapy curricula. Integrates presentation of self and professionalism.
Term Offered: Summer

OCCT 7310 FW and Professional Dev I
[1 credit hour]
Introduces Level I and Level II Fieldwork, and the Capstone Experience, including policy, procedures, and documentation and the portfolio assignment. Defines professional behavior and health care communication. Encourages discussion of Level I fieldwork experiences. Includes Level I fieldwork experience. Prerequisite: Admission to the OTD Program
Term Offered: Fall

OCCT 7320 FW and Professional Dev II
[1 credit hour]
Emphasizes interviewing clients for an occupational profile. Encourages discussion of Level I fieldwork experiences. Introduces the course sequence of the Capstone Experience. Includes Level I fieldwork experience. Prerequisite: Fieldwork and Professional Development Seminar I
Term Offered: Spring

OCCT 7330 FW and Professional Dev III
[1 credit hour]
Introduces Capstone Seminar opportunities in teaching, research, program development, or clinical practice. Introduces Capstone Manual and structure for planning the individualized Capstone Experience. Provides a forum for discussion fieldwork experiences. Summer Prerequisite: Fieldwork and Professional Development Seminar II
Term Offered: Summer

OCCT 7400 Conditions in OT
[2 credit hours]
Reviews the physical and mental health conditions that challenge successful and satisfying occupational performance, with an emphasis on the aspects of medical management and rehabilitation relevant to the role of the occupational therapist. Spring Prerequisite: Occupational Therapy Advocacy I
Term Offered: Spring

OCCT 7410 OT Foundations I: Domain & Process
[3 credit hours]
Introduces the history, philosophy, core concepts, ethics, and the domain and process of occupational therapy. Explores the basic tenets of therapeutic occupation and investigates the role that chosen occupations play within an individual's daily life. Professional skills in occupational analysis and professional communication are introduced and applied.
Term Offered: Fall

OCCT 7420 OT Foundations II: Models of Practice
[4 credit hours]
Explores historical and alternative conceptual frameworks of occupation and therapeutic occupation. Examines cognitively based and general models of practice. Presents related assessments and interventions for prevention, adaptation, and compensation.
Term Offered: Spring

OCCT 7430 OT Foundations III: Conditions
[2 credit hours]
Provides foundational knowledge of physical and mental health conditions and their impact on occupational performance and participation. Emphasizes medical management and rehabilitation relevant to the role of occupational therapy.
Term Offered: Spring

OCCT 7510 OT Practice I: Human Movement & Performance
[5 credit hours]
Examines the biomechanical model of practice including its musculoskeletal and kinesiological foundations. Includes assessments and interventions for remediation, prevention, adaptation, and compensation.
Term Offered: Fall

OCCT 7520 OT Practice II: Neuroscience
[5 credit hours]
An introduction to the nervous system, with emphasis on the neurological basis of human occupation and the effects of neurological conditions (disease, injury, and mental illness) on occupational performance. Explores neuroplasticity and neuro rehabilitation. Labs include neuroanatomy and clinical assessment.
Term Offered: Spring

OCCT 7530 OT Practice III: Children & Youth
[3 credit hours]
Focuses on the occupational therapy process and models of practice for intervention with children and youth, including assessment and intervention.
Term Offered: Summer

OCCT 7540 OT Practice IV: Neurorehabilitation
[3 credit hours]
Focuses on the occupational therapy process and models of practice for intervention with individuals with neurological impairments, including assessment and intervention.
Term Offered: Summer

OCCT 7710 OT Fieldwork & Professional Development I
[1 credit hour]
Introduces Level I and Level II Fieldwork and the Doctoral Capstone, laying the foundation for professional practice in occupational therapy. Explores fieldwork policies, procedures, and documentation, and the development a professional portfolio. Defines professional behavior and healthcare communication. Includes Level I fieldwork experience with reflective discussion.
Term Offered: Fall

OCCT 7720 OT Fieldwork & Professional Development II
[1 credit hour]
Emphasis on interviewing clients for an occupational profile and fostering cultural competence on occupational engagement. Includes Level I fieldwork experience with preparatory discussion.
Prerequisites: OCCT 7710 with a minimum grade of C
Term Offered: Spring

OCCT 7730 OT Fieldwork & Professional Development III
[1 credit hour]
Emphasizes observation as an assessment measure. Provides practice for planning and implementing client-centered occupation-based interventions including grading up and down, therapeutic use of self, and behavior management. Includes Level I fieldwork experience with reflective discussion.
Prerequisites: OCCT 7720 with a minimum grade of C
Term Offered: Summer

OCCT 8050 OT Models of Practice V
[5 credit hours]
Advances clinical reasoning for occupational therapy practice to support occupational performance throughout the lifespan, including prevention of occupational impairment. Prerequisite: Occupational Therapy Models of Practice IV Co-requisite: Occupational Therapy Models of Practice VI
Term Offered: Spring

OCCT 8060 OT Models of Practice VI
[4 credit hours]
Examines compensation-oriented models of practice including assistive technology, positioning, patient handling, and mobility. Presents occupational and non-occupational assessments and interventions for prevention, adaptation, and compensation. Prerequisite: Occupational Therapy Models IV Co-requisite: Occupational Therapy Models V
Term Offered: Fall

OCCT 8070 OT Models of Practice VII
[4 credit hours]
Examines contemporary and possible models of practice emphasizing wellness, health promotion, community care, population-based intervention and other emerging trends. Provides students with leadership experiences in program development. Prerequisite: Occupational Therapy Models of Practice VI Corequisite: Occupational Therapy Models of Practice VIII
Term Offered: Spring

OCCT 8080 OT Models of Practive VIII
[3 credit hours]
Models of practice emphasizing group occupational forms, group process, and therapeutic use of self in groups. Involves practice in assessment and intervention with persons experiencing both physical and mental health conditions. Prerequisite: Occupational Therapy Models of Practice VI Co-requisite: Occupational Therapy Models of Practice VII
Term Offered: Fall

OCCT 8120 Research in OT II
[3 credit hours]
Provides structure for student, guided by faculty mentor, to define a research question, investigate the literature, explore the site(s) for data collection, and prepare preliminary research proposal. Involves individual faculty contact. Spring Prerequisite: Research in Occupational Therapy I
Term Offered: Spring

OCCT 8130 Research in Occ Therapy III
[3 credit hours]
Provides structure for student to begin data collection after obtaining official approval of project by major advisor and institutional review board. Involves individual faculty contact. Fall, Spring, Summer Prerequisite: Research in Occupational Therapy II
Term Offered: Fall

OCCT 8140 OT Research IV: Scholarly Project Completion
[2 credit hours]
Includes completion of data collection and transitions to analysis of results employing accepted statistical and other accepted analytical methods.
Prerequisites: OCCT 7130 with a minimum grade of C
Term Offered: Spring, Summer, Fall

OCCT 8150 OT Research V: Scholarly Project Presentation
[2 credit hours]
Includes preparation and delivery of the research presentation as the culmination of the student's scholarly project.
Prerequisites: OCCT 8140 with a minimum grade of C
Term Offered: Spring, Summer, Fall

OCCT 8230 OT Advocacy III: Advocacy & Populations
[2 credit hours]
Identifies advocacy issues relevant to occupational therapy and introduces community resources that can enhance successful and satisfying reintegration back into home, school, work, and/or community. Explores legislation and ethical issues that influence health care provision.
Term Offered: Fall

OCCT 8240 OT Advocacy IV: Leadership & Management
[3 credit hours]
Examines leadership, management, and supervision of occupational therapy services in a dynamic health care system. Addresses legislative, regulatory, and payment issues affecting program development. Encourages leadership development.
Term Offered: Spring

OCCT 8340 FW and Professional Dev IV
[1 credit hour]
Addresses communication with children, family members, and health care professionals; ethics and safety; and cultural diversity. Students identify Capstone Practicum sites, site mentor(s), and the faculty mentor. A forum for discussion of Level I fieldwork experiences is provided. Level I fieldwork experience is included. Prerequisite: Fieldwork and Professional Development Seminar II
Term Offered: Fall

OCCT 8350 FW and Professional Dev V
[3 credit hours]
Addresses issues of clinical supervision; Level II fieldwork policy, procedures, and documentation; and professional development. A forum for discussion of Level I fieldwork experiences is provided. Students develop a comprehensive Capstone Proposal. Includes Level I fieldwork experience. Prerequisite: Fieldwork and Professional Development Seminar IV
Term Offered: Spring

OCCT 8360 Fieldwork Level II
[3 credit hours]
Provides a 12 - week, full-time, supervised fieldwork experience where students refine entry-level abilities to integrate occupational therapy theory, research, and practice under supervision and with collaboration of the academic institution. An on-line forum for discussion of Level II fieldwork experiences is provided. Prerequisite: Completion of academic content except research, which may be taken concurrently
Term Offered: Summer, Fall

OCCT 8370 Fieldwork Level II
[6 credit hours]
Provides a 12 - week, full-time, supervised fieldwork experience where students refine entry-level abilities to integrate occupational therapy theory, research, and practice under supervision and with collaboration of the academic institution. An on-line forum for discussion of Level II fieldwork experiences is provided. Prerequisite: OCCT 8360 and completion of academic content except research, which may be taken concurrently
Prerequisites: OCCT 8360 (may be taken concurrently) with a minimum grade of D-
Term Offered: Fall

OCCT 8380 Capstone Practicum
[6 credit hours]
Students develop skills in teaching, research, program development, advocacy or clinical practice with mentorship by faculty and on-site practitioners. This course, in combination with OCCT 8900 and OCCT 8910 requires documentation of 560 hours. Prerequisite: Level II FW, competency exam, all courses except research
Term Offered: Spring

OCCT 8400 Physical Agent Modalities and Other Non-Occupational Methods
[2 credit hours]
Addresses non-occupational methods including physical agent modalities and technology used with medically complex patients. Covers scientific underpinnings and regulatory guidelines for appropriate use of physical agent modalities in occupational therapy. Summer Prerequisite: Occupational Models of Practice VI
Term Offered: Summer

OCCT 8440 OT Foundations IV: Interprofessional Education
[1 credit hour]
Team-based interprofessional education focused on understanding the roles of members of healthcare teams, communication strategies, collaboration, and patient safety.
Term Offered: Fall

OCCT 8450 OT Foundations V: Program Development
[4 credit hours]
Examines contemporary and possible models of practice emphasizing wellness, health promotion, community care, population-based intervention and other emerging trends. Provides students with leadership experiences in program development.
Term Offered: Spring

OCCT 8550 OT Practice V: Physical Rehabilitation
[5 credit hours]
Focuses on necessary components of clinical intervention for individuals with physical disability including assistive technology, positioning, patient handling, and mobility.
Term Offered: Fall

OCCT 8560 OT Practice VI: Behavioral & Mental Health
[3 credit hours]
Focuses on necessary components of clinical intervention to improve behvioral and mental health for clients with both physical and mental health conditions, incuding group interventions, group process, and therapeutic use of self in groups.
Term Offered: Fall

OCCT 8570 OT Practice VII: Professional Reasoning Across the Lifespan
[5 credit hours]
Advances clinical reasoning for occupational therapy practice to support occupational performance throughout the lifespan, including prevention of occupational impairment.
Term Offered: Spring

OCCT 8580 OT Practice VIII: Clinical Care
[2 credit hours]
Focuses on the knowledge and skill to provide occupational therapy interventions in clinical settings, such as hand therapy and orthopedic clinics, hospitals, and acute and sub-acute hospitals. Includes labs and competencies for physical agent modalities and equipment used with medically complex patients.
Term Offered: Summer

OCCT 8740 OT Fieldwork & Professional Development IV
[2 credit hours]
Students begin Doctoral Capstone preparation through site selection and needs assessment for their casptone proposal. Course covers identifying a practicum site, securing site and faculty mentors, and dissemination options. Fieldwork topics include communication with children, families, and healthcare professionals; ethics and safety; and cultural diversity. Includes discussion of Level I fieldwork experiences.
Prerequisites: OCCT 7730 (may be taken concurrently) with a minimum grade of S
Term Offered: Fall

OCCT 8750 OT Fieldwork & Professional Development V
[1 credit hour]
Addresses issues of clinical supervision; prepares for Level II fieldwork by reviewing policy, procedures, and documentation. Emphasizes personal responsiblity for learning and professional development. A forum for discussion of Level I fieldwork experiences is provided.
Prerequisites: OCCT 8740 with a minimum grade of S
Term Offered: Spring

OCCT 8760 OT Fieldwork & Professional Development VI
[1 credit hour]
Students complete a comprehensive proposal for the Doctoral Capstone. Includes the development of overall goals; rationales for site and mentor selection; measurable objectives; learning methods to be accomplished; and criteria for student evaluation.
Term Offered: Summer

OCCT 8800 Independent Study OT
[0-12 credit hours]
Intensive study in a field of interest, including theoretical and experimental work. May be repeated for credit. Prerequisite: Admission to OTD program or consent of instructor Fall, Spring, Summer
Term Offered: Summer, Fall

OCCT 8900 Mentored Capstone Dissemination
[3 credit hours]
Focuses on individualized issues arising in the Capstone Practicum. Involves mentorship by site and faculty practitioners and culminates in a paper and a presentation dealing with a specific area within occupational therapy. Spring Prerequisite: Level II fieldwork and completion of academic content except research, which may be taken concurrently Co-requisites: Mentored Studies in Capstone Area or approved elective and Capstone Practicum
Term Offered: Spring

OCCT 8910 Mentored Studies:Capstone Area
[3 credit hours]
Focuses on mastery of literature and in-depth knowledge of an area within occupational therapy through exploration of library, electronic, and clinical resources. Lends theoretical and research support to the Capstone Practicum. Spring Prerequisite: Level II fieldwork and completion of academic content except research, which may be taken concurrently Co-requisites: Mentored Capstone Dissemination and Capstone Fieldwork Practicum
Term Offered: Spring

OCCT 9810 OT Fieldwork: Level II A
[3 credit hours]
Provides a 12 - week, full-time, supervised fieldwork experience where students refine entry-level abilities to integrate occupational therapy theory, research, and practice under supervision and with collaboration of the academic institution. An on-line forum for discussion of Level II fieldwork experiences is provided.
Prerequisites: OCCT 8750 with a minimum grade of S
Term Offered: Spring, Summer, Fall

OCCT 9820 OT Fieldwork: Level II B
[6 credit hours]
Provides a second 12 - week, full-time, supervised fieldwork experience where students refine entry-level abilities to integrate occupational therapy theory, research, and practice under supervision and with collaboration of the academic institution. An on-line forum for discussion of Level II fieldwork experiences is provided.
Term Offered: Spring, Summer, Fall

OCCT 9900 Occupational Therapy Doctorate Capstone
[10 credit hours]
Student develop skills aligned with the individualized objectives in their approved captone proposal with mentorship by faculty and on-site practitioners.
Prerequisites: OCCT 9820 with a minimum grade of S
Term Offered: Spring, Summer, Fall

Operations & Supply Chain Management (OSCM)

OSCM 5510 Data, Decisions and Operations
[3 credit hours]
This course surveys quantitative models used in business decision-making, with a particular emphasis on the structuring of decision problems arising in a variety of business contexts. Topics discussed include probability theory, statistics, regression, manufacturing processes, quality control, and inventory management.

OSCM 6250 Essentials of Business Analytics
[3 credit hours]
This course provides a broad understanding of tools, techniques and business issues in using business analytics. It extends data visualization and predictive analysis tools gained in statistics courses. It also introduces decision analysis and develops comprehension of evaluative tools such as spreadsheet modeling. Skills in problem identification and analysis will be developed through the use of cases.
Prerequisites: BUAD 3020 with a minimum grade of C or OSCM 5510 with a minimum grade of C

OSCM 6270 Simulation and Waiting Lines
[3 credit hours]
Students are introduced to modeling uncertainty in supply chain systems using simulation. Simulation will be introduced through spread sheet as well as simulation software (e.g. , @Risk, Simul8, ARENA). Topics such as fitting distributions, validation, verification, confidence intervals, experimental design as well an introduction to waiting line models and comparison of simulation with analytical models will be covered.
Prerequisites: BUAD 3020 with a minimum grade of C or OSCM 5510 with a minimum grade of C

OSCM 6350 Prescriptive Analytics
[3 credit hours]
This course requires students to apply software tools that are used within businesses for advanced modeling practices. In particular, students will explore prescriptive analytics techniques used in optimization and simulation. Students are expected to demonstrate the skills learned in this class with course assignments based on real-world cases.
Term Offered: Spring, Fall

OSCM 6550 Business Analytics and Cases
[3 credit hours]
The goal of this course is to present an emerging or new topic in business analytics, for which we do not have a regular course. Students learn how to make optimal business strategy/decision by applying business analytics techniques and tools through case-based study.
Prerequisites: BUAD 2060 with a minimum grade of C and BUAD 3020 with a minimum grade of C or OSCM 5510 with a minimum grade of C
Term Offered: Spring, Fall

OSCM 6680 Quality Management and Six Sigma
[3 credit hours]
The course introduces students to the TQM philosophy, concepts and statistical theory behind the tools will be discussed. It also addresses process improvement, lean, six sigma and related topics. Provides students with an overall approach for the design of a system to manage quality and reliability along the entire value chain.
Prerequisites: (BUAD 2060 with a minimum grade of C and BUAD 3020 with a minimum grade of C) or OSCM 5510 with a minimum grade of C

OSCM 6690 Supply Chain Resources Management
[3 credit hours]
Study of operations planning, scheduling, and inventory systems with tools such as MRP, JIT and bottleneck approaches in the context of supply chains through business cases where appropriate.
Prerequisites: BUAD 3020 with a minimum grade of C or OSCM 5510 with a minimum grade of C

OSCM 6780 ERP Systems Process Management
[3 credit hours]
This course will provide students an overview of the fundamental business processes and examination of the application of business enterprise software using SAP. Issues include software deployment that supports transaction processing in the business supply chain. Also, students will work on various hands-on exercises including process of entire business cycle with a fictitious company and implementation of simple application with netweaver development platform.
Term Offered: Fall

OSCM 6950 Capstone Project
[3 credit hours]
In this culminating project, students draw on the breadth and depth of the curriculum to address an industry supplied problem in small teams. Students will explore descriptive, prescriptive and/or prescriptive analytics as is appropriate to their design project.
Prerequisites: INFS 6450 with a minimum grade of D- and OSCM 6350 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

OSCM 6960 Masters Thesis
[1-6 credit hours]
Master's thesis: To study a research problem in depth and solve the problem and write an academic or scholarly paper or develop a teaching instrument such as case or game based on the research.
Prerequisites: OPMT 5520 with a minimum grade of C or OSCM 5520 with a minimum grade of C and INFS 6750 with a minimum grade of C

OSCM 6980 Special Topics in Operations and Supply Chain Management
[3 credit hours]
The goal of this course is to present an emerging or new topic in Operations and Supply Chain Management for which we do not have a regular course.
Prerequisites: BUAD 3020 with a minimum grade of C or OSCM 5510 with a minimum grade of C

OSCM 8690 Supply Chain Resources Management
[3 credit hours]
Study of operations planning, scheduling, and inventory systems with tools such as MRP, JIT and bottleneck approaches in the context of supply chains through business cases where appropriate.
Prerequisites: BUAD 3020 with a minimum grade of C or OSCM 5510 with a minimum grade of C

Orthopedics (ORTH)

ORTH 5700 Orthopaedic X-Ray Conference
[2 credit hours]
Weekly discussion of interesting and challenging clinical orthopaedic cases through X-ray conference discussion. Management and treatment options of each case presented also are discussed. May be repeated for credit.
Term Offered: Spring, Summer, Fall

ORTH 5800 Ortho Bone Physiology
[3 credit hours]
Lecture topics will include the physiology of bone fracture healing process, bone adaptation, molecular genetics of the musculoskeletal system, bone tumor process, etc. This course serves to provide the student with a good general knowledge of bone physiology and its function.
Term Offered: Spring, Fall

ORTH 5850 Introduction to Clinical Orthopaedics
[3 credit hours]
Introduction to Clinical Orthopaedics provides an overview of the various sub-specialties within Orthopaedic Surgery. Students are familiarized to the clinic and operating room setting. They will be taught the importance of common physical exam findings, interpretation of radiographic studies and the importance of routine laboratory tests as they relate to conditions of the musculoskeletal system.
Term Offered: Spring, Summer, Fall

ORTH 5900 Orthopaedic Biomechanics I
[3 credit hours]
Introduction to the basic biomechanics concept in orthopaedics. Lectures will include statistics and dynamics analysis of forces as applied to the musculoskeletal system. Topics to be covered will also include biomechanics of fixation devices, modeling effects of bone, stress shielding, micro- and macroscopic analysis of bone mechanics, etc.
Term Offered: Summer, Fall

ORTH 5910 Thesis Research Neurosci Neuro
[3 credit hours]
This course concentrates on the studies of body joint mechanics and the dynamics of joint motion. Lectures also will include artificial joint prosthesis designs, including new orthopaedic devices and implants.
Term Offered: Spring

ORTH 5920 Orthopaedic Biomechanics III
[3 credit hours]
This course will cover principally motion analysis, gait, and rehabilitation biomechanics as they apply to the orthopaedic patient. Lectures will include 3-D motion analysis as well as a force plate quantification of gait and movement.
Term Offered: Fall

ORTH 6500 Orthopaedic Basic Science Sem
[3 credit hours]
Weekly lectures on various orthopaedic topics ranging from bone histology to biomechanics. The lectures focus on the basic science of orthopaedics, including the physiology, biochemistry, genetics, anatomy, etc. of the musculoskeletal system. May be repeated for credit.
Term Offered: Spring, Fall

ORTH 6550 Jrnl Rev Orthopaedic Science
[1 credit hour]
Orthopaedic Grand Rounds is a conference format where nationally known authorities on orthopaedic topics present a talk, followed by discussion of challenging clinical cases presented to the speaker. Usually the topics involve the latest state-of-the-art orthopaedic treatments or breakthroughs. The Journal Club meetings are seminar discussions of the latest scientific research articles from professionally recognized journals. May be repeated for credit.
Term Offered: Spring, Summer, Fall

ORTH 6750 Biomaterials in Medicine
[3 credit hours]
Biomaterials use in wide variety range of applications in medicine including drug delivery carriers and replacement of tissues.
Term Offered: Spring

ORTH 6910 Orthopaedic Trauma
[1 credit hour]
Topics could include the trauma of musculoskeletal system, the pathogenesis, treatment options and clinical outcomes; may involve theoretical and/or experimental work. May be repeated for credit.
Term Offered: Summer, Fall

ORTH 6920 Orthopaedic Spine
[1 credit hour]
Focus will be on spine mechanics, anatomy, spine fixation devices, clinical outcome of spine surgeries, etc. May involve theoretical and/or experimental work. May be repeated for credit.
Term Offered: Summer, Fall

ORTH 6940 Adult Reconstruction & Tumor
[1-3 credit hours]
ORTH 6940 is a clinical elective in Audit Reconstruction and Orthopaedic Oncology. Students will gain familiarity with concepts in joint replacement and the problems associated with it. Students will have the opportunity to observe hip and knee replacement surgeries. There is also exposure to tumors of the musculoskeletal system and reconstructive options for their treatment. Students will spend 1 – 3 hours per week with a physician in those specialties.
Term Offered: Spring, Summer, Fall

ORTH 6960 Upper Extremity and Hand
[3 credit hours]
Topics will include (but are not limited to) study of the biomechanics of the upper extremity and hand, brachial plexus injuries, treatment options, surgical exposures, detail anatomy, etc. May involve theoretical and/or experimental work. May be repeated for credit.
Term Offered: Spring, Fall

ORTH 6990 Thesis Research
[3-6 credit hours]
Each student is required to work with a mentor on a research project that may include laboratory and/or clinical research on a project of interest to Orthopaedics……. Each student will be expected to have a committee consisting of no less than 3 faculty members, including the student's mentor as the chair of the committee. Regular meetings will be scheduled to review the thesis project and ensure progress towards completion of the thesis research in a timely manner. The student will be expected to write a thesis at the completion of their project and defend this to their committee and give a public presentation.
Term Offered: Spring, Summer, Fall

ORTH 8750 Biomaterials in Medicine
[3 credit hours]
Biomaterials use in wide variety range of applications in medicine including drug delivery carriers and replacement of tissues.
Term Offered: Spring

Pathology (PATH)

PATH 6040 Pathology Assistants: Medical Ethics
[1 credit hour]
This course is an introduction to Medical Ethics for the Pathology Assistant. Focus is on the issues faced by the pathologist and pathology assistants. The course will be seminar based and will involve presentations and case discussions.
Term Offered: Spring

PATH 6050 Clinical Neuropathology
[1 credit hour]

PATH 6060 Surgical Clinical Rotation
[0-4 credit hours]
Introduces students to surgical pathology and cytology including gross evaluation of tissues, tissue processing and microscopic evaluation of diseased human tissues to render a diagnosis, recommend treatment and evaluate prognosis. In addition, students will attend and/or present case materials at conferences.
Term Offered: Spring, Summer, Fall

PATH 6070 Intro Clinical Lab Medicine
[0-4 credit hours]
An introductory course designed to acquaint students with the laboratory tests that are available in the clinical laboratory, prioritization of test ordering, how the tests are performed and their usefulness in clinical diagnosis and clinical investigation.
Term Offered: Spring, Summer, Fall

PATH 6080 Postmortem Clinical Rotation
[0-4 credit hours]
An introductory course designed to acquaint students with the autopsy. It consists of a series of lectures, demonstrations and readings pertaining to the human autopsy. Students will be involved in the actual performance of autopsies, the selection of appropriate tissues for microscopic examination, microscopic examination of tissues, rendering a diagnosis and completing autopsy reports. The autopsies are performed at MCO and the Lucas County Coroner's Office.
Term Offered: Spring, Summer, Fall

PATH 6720 Current Topics in Pathology
[1-4 credit hours]
A lecture and/or seminar course in topics of current interest in pathology with special emphasis on the fundamentals of mammalian, especially human, life under normal, experimental, or pathological conditions. Students and department faculty will present and moderate the discussion of original research publications. May be repeated for credit.

PATH 6730 Research in Pathology
[1-4 credit hours]
Students will participate in selected ongoing research programs of the department faculty. May be repeated for credit.

PATH 6770 Embryology and Teratology
[1 credit hour]
This course provides a post-graduate level understanding of molecular, genetic, cellular and environmental mechanisms involved in: 1. Early human embryonic development i.e. primordial germ cell information, gamete formation, fertilization, blastulation, implantation and gastrulation (formation of bilaminar and trilminar germ discs) and associated pathological malformations or diseases and 2. Normal and abnormal development of selected tissues, body organs and systems, and their pathological manifestations.
Term Offered: Spring

PATH 6780 Histology and Cell Physiology I
[2 credit hours]
The course is intended to introduce histologic techniques including tissue fixation, processing, staining, mircrotomy, and the special techniques of histochemistry and immunocytochemistry for light microscopy: in addition basic optics and the use of bright field, phase contrast and fluorescence microscopy will be addressed. The course will integrate microscopic anatomy. The course is intended to integrate microscopic anatomy with tissue specific physiology. The course schedule is designed to meld with the disease content of the organ systems of the medical school curriculum to provide a basis of normal microscopic anatomy (histology) and specific functions of organ specific cell types. There is a strong emphasis on independent study of cell physiology to accompany didactic presentations of microscopic anatomy including utilization of virtual tissue slides.
Prerequisites: ANAT 5000 with a minimum grade of D-

PATH 6790 Histology and Cell Physiology II
[2 credit hours]
The course is intended to integrate microscopic anatomy with tissue specific physiology. The course schedule is designed to meld with the disease content of the organ systems of the medical school curriculum to provide a basis of normal microscopic anatomy (histology) and specific functions of organ specific cell types. There is a strong emphasis on independent study of cell physiology to accompany didactic presentations of microscopic anatomy including utilization of virtual tissue slides.
Prerequisites: PATH 6780 with a minimum grade of D-

PATH 6890 Independent Study in Pathology
[0-12 credit hours]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring, Summer, Fall

PATH 7050 Clinical Neuropathology
[1 credit hour]

PATH 7125 Laboratory Management
[4 credit hours]
This course provides students with the background information needed to step into management or supervisory roles in a laboratory setting. The five management topics covered in this course are Operations, Informatics, Compliance, Personnel Management, and Financial Management. This course is online only
Term Offered: Spring

PATH 7130 Pathology
[1-6 credit hours]
This course is designed to acquaint students with the basic concepts of general and systems-based pathology using didactic lectures to teach general pathologic mechanisms as well as organ specific pathology. Students will learn to correlate normal anatomy, gross examination and microscopic diagnosis. An emphasis will be placed on cancer staging using CAP cancer protocols. Students will continue to perform gross examination throughout this course allowing them to connect and apply concepts from their didactic sessions with the specimens they are dissecting.
Prerequisites: ANAT 5000 with a minimum grade of C
Term Offered: Spring, Fall

PATH 8050 Clinical Neuropathology
[1 credit hour]

PATH 8060 Intro Surgical Path and Cytolo
[1-4 credit hours]
Introduces students to surgical pathology and cytology including gross evaluation of tissues, tissue processing and microscopic evaluation of diseased human tissues to render a diagnosis, recommend treatment and evaluate prognosis. In addition, students will attend and/or present case materials at conferences.

PATH 8070 Intro Clinical Lab Medicine
[1-4 credit hours]
An introductory course designed to acquaint students with the laboratory tests that are available in the clinical laboratory, prioritization of test ordering, how the tests are performed and their usefulness in clinical diagnosis and clinical investigation.

PATH 8080 Intro Postmortem Pathology
[1-4 credit hours]
An introductory course designed to acquaint students with the autopsy. It consists of a series of lectures, demonstrations and readings pertaining to the human autopsy. Students will be involved in the actual performance of autopsies, the selection of appropriate tissues for microscopic examination, microscopic examination of tissues, rendering a diagnosis and completing autopsy reports. The autopsies are performed at MCO and the Lucas County Coroner's Office.

PATH 8720 Current Topics in Pathology
[1-4 credit hours]
A lecture and/or seminar course in topics of current interest in pathology with special emphasis on the fundamentals of mammalian, especially human, life under normal, experimental, or pathological conditions. Students and department faculty will present and moderate the discussion of original research publications. May be repeated for credit.

PATH 8730 Research in Pathology
[1-4 credit hours]
Students will participate in selected ongoing research programs of the department faculty. May be repeated for credit.

PATH 8890 Independent Study in Pathology
[1-12 credit hours]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit.

Pharmacology (PHCL)

PHCL 5100 Experimental Therapeutics I
[3 credit hours]
The course will cover the application of basic principles of pharmacology to the development of new therapies for human disease. A primary focus will be the translation of laboratory discoveries into clinical applications.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 5200 Experimental Therapeutics II
[3 credit hours]
The course will expand upon material covered in Experimental Therapeutics I and focus on the drug development process. Practical applications include the design of in vitro and in vivo screens for drug activity, improvement of pharmacokinetic properties and integration of medicinal chemistry with pharmacology in a drug development paradigm.
Prerequisites: PHCL 5100 with a minimum grade of B-
Term Offered: Spring

PHCL 5440 Current Topics in Interpretation of Pharmaceutical Data
[1 credit hour]
The basic statistical techniques learned in PHCL 5140 will be further explored using research articles and real data sets to conduct statistical analyses. The use of different software programs will be used to provide students with hands-on practice in conducting statistical analyses.
Prerequisites: PHCL 5140 (may be taken concurrently) with a minimum grade of B-
Term Offered: Summer

PHCL 5460 Current Topics in Pharmacokinetics Toxicokinetics
[1 credit hour]
An advanced discussion of the theory and practice of using kinetic principles to model the time course of drugs and toxic chemicals in the body and in the environment. The student should understand the relationship between chemical time courses and outcomes and application to risk assessment. Additionally, students will gain hands-on practice using kinetic analysis methods and software.
Prerequisites: PHCL 4760 with a minimum grade of B- or PHCL 5760 (may be taken concurrently) with a minimum grade of B-
Term Offered: Spring, Fall

PHCL 5500 From Experimental to Applied Therapeutics
[4 credit hours]
The course focuses on bridging the gap between experimental and clinical applications of drugs. It will discuss groups of structurally related drugs designed to treat certain conditions, their basic molecular pharmacological action and how that is applied clinically. The course will also include discussing toxicity of some drugs and xenobiotics manufactured for certain applications, their basic molecular actions and their clinical toxicity.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 5700 Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology
[3 credit hours]
An introduction to the principles of pharmacology and the pharmacology of the autonomic nervous system."
Term Offered: Fall

PHCL 5720 Pharmacology II: Endocrine And Cns Pharmacology
[3 credit hours]
The pharmacology of drugs acting upon the endocrine and reproductive systems will be discussed, followed by a treatment of drugs used in the management of sleep disorders, anxiety, affective illness, schizophrenia and seizure disorders.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 with a minimum grade of C
Term Offered: Spring

PHCL 5730 Principles and Systems Toxicology
[3 credit hours]
This course reviews the basic elements of toxicology. It includes those principles most frequently involved in a full understanding of toxicologic events, such as dose-response, lethal dose-50 (LD50) and margin of safety. It also identifies toxic chemicals and their systemic sites and mechanisms of action. Finally, this course provides information about the kinds of toxic injuries produces in specific organs or systems and the toxic agents that produce these effects. Information about the possible management of some cases of intoxication or poisonings by some agents will be briefly reviewed.
Term Offered: Fall

PHCL 5750 Toxicology II
[3 credit hours]
This course provides the students with an overview of environmental toxicology, which emphasizes both air and water pollution. It also reviews the applications of different areas of toxicology, such as food toxicology emphasizing the safety standards of food and methods of evaluation of food safety, analytic toxicology and its applications in forensic toxicology, and occupational toxicology, emphasizing the health effects of industrial chemicals on workers. General methodologies for toxicity testing are also discussed.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 with a minimum grade of C
Term Offered: Spring

PHCL 5760 Toxicokinetics
[3 credit hours]
This course introduces the student to basic concepts involved in the absorption, distribution, metabolism, and elimination of medications in the body. The dynamics of various pharmacokinetic processes will be expounded by means of various parameters and models. The student will apply mathematical formalisms to calculate various pharmacokinetic parameters to further formulate and design individualized dosage regimens.
Term Offered: Spring, Summer, Fall

PHCL 5770 Current Topics in Toxicology I
[1 credit hour]
The course focuses on the most recently published studies that cover advances in the field of toxicology, including risk assessment of toxic chemicals, toxicokinetics, chemically ¿induced mutations, cancer and developmental toxicity, toxic responses of various body systems to different chemicals and drugs, toxicity of pesticides and heavy metals.
Prerequisites: PHCL 4730 with a minimum grade of B- or PHCL 5730 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 5800 Principles and Methods of Forensic Toxicology
[3 credit hours]
Introduction to the goals and methods of forensic toxicology, including post-mortem forensic toxicology, human performance forensic toxicology, and forensic toxicology testing. Introduction to the general methods used to analyze different types of sample types and analytes in forensic toxicology.
Term Offered: Spring, Summer, Fall

PHCL 5810 Laboratory Quality Assurance and Quality Control
[3 credit hours]
This course teaches the principles of quality assurance and quality control as they apply to the laboratory sciences. These approaches include standards and controls, written procedures, and method validation used in biological, pharmacological, toxicological and forensic sciences.
Term Offered: Spring, Summer, Fall

PHCL 5990 Problems In Pharmacology
[1-6 credit hours]
Tutorial or directed individual research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 6160 Biopharmaceutics & Pharmacokinetics
[3 credit hours]
This course will provide the theoretical basis and clinical application of pharmacokinetics as relates to drug dosing, absorption, distribution, biotransformation, and excretion.
Term Offered: Spring

PHCL 6300 Research Experience in Experimental Therapeutics
[2-6 credit hours]
The course is intended for laboratory rotations to familiarize students with research topics in various clinical/basic science laboratories. A primary focus is to allow students to shadow, learn, experience and perform specific laboratory techniques.
Term Offered: Spring, Summer, Fall

PHCL 6320 NEUROLOGICAL AND PSYCHIATRIC PHARMACOLOGY
[1 credit hour]
A course analyzing the pharmacology of neurologically based attributes and disorders.
Corequisites: MBC 6320, PHPR 6140
Term Offered: Spring

PHCL 6390 Problems in Experimental Therapeutics
[1-6 credit hours]
The course will examine current topics and trends in the field of experimental therapeutics. The nature of the course will vary from student to student, depending on their background in the field, and the nature of their interest. For example, a new student may be assigned a literature search to identify papers that describe current approaches toward the treatment of human disease. A more advanced student might be given the task of researching and developing new laboratory techniques to initiate a research project. The overall goal will be to introduce students to current problems in experimental therapeutics, and help them identify an approach toward solving these problems.
Term Offered: Spring, Summer, Fall

PHCL 6400 Cannabis Science – Risks & Benefits
[3 credit hours]
Cannabis Science – Risks and Benefits – delves into the pharmacology, biochemistry, pharmacokinetics, and toxicology of cannabis products. The course will also cover the neuropsychopharmacology of cannabis and the effects of short term and long term uses of cannabis in the central nervous and peripheral systems.
Term Offered: Spring, Fall

PHCL 6600 Seminar In Pharmacology
[1 credit hour]
Pharmacology students will attend seminar presentations offered in the departments of , and must present at least one seminar.
Term Offered: Fall

PHCL 6650 Seminar in Experimental Therapeutics
[2 credit hours]
The course includes seminars presented by scientists from academia, industry and government who are invited by the department to speak about their research. Research subjects to be covered by the seminars are within the field of therapeutics and related areas, such as toxicology, molecular and genetic mechanisms in drug/chemical action, risk assessment, biomarkers and others.
Term Offered: Spring, Fall

PHCL 6700 Pharmacology III: Cns And Cardiovascular/Renal Pharmacology
[3 credit hours]
The pharmacology of central nervous system active agents . Agents acting on the cardiovascular and renal systems are discussed.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of C
Term Offered: Fall

PHCL 6710 Fundamentals of Biostatistics and Research Analysis
[3 credit hours]
This course discusses biostatistical analysis, evaluation of peer-reviewed literature, and interpreting research concepts, methods, data, and outcomes in preparation for the cosmetic science project.
Term Offered: Summer, Fall

PHCL 6720 Pharmacology IV; Chemotherapeutics
[3 credit hours]
The pharmacology of anti-infective chemotherapeutic agents is presented. Issues such as the mechanism of antimicrobial action, disposition, resistance and problems attending the use of antimicrobial drugs will be discussed.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 with a minimum grade of C
Term Offered: Spring

PHCL 6800 Drug Metabolism and Molecular Toxicology
[3 credit hours]
This course teaches the principles of molecular toxicology and considers how drug metabolism produces and limits toxicity. Mechanism of biotransformation of drugs and other xenobiotics, and the contributions of these mechanisms to drug toxicity are explored
Term Offered: Spring, Summer, Fall

PHCL 6810 Forensic Toxicology and the Law
[3 credit hours]
Consideration of the legal principles and procedures underlying the application of forensic toxicology.
Term Offered: Spring, Summer, Fall

PHCL 6820 Forensic Toxicology Capstone
[3 credit hours]
In this capstone course for the MS in forensic toxicology students will research a topic of interest under the direction of a faculty mentor.
Term Offered: Spring, Summer, Fall

PHCL 6900 M.s. Thesis Research In Pharmacology
[1-6 credit hours]
M.S. thesis research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 6920 M.s. Thesis Research In Pharmacology
[1-6 credit hours]
M.S. thesis research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 7100 Experimental Therapeutics I
[3 credit hours]
The course will cover the application of basic principles of pharmacology to the development of new therapies for human disease. A primary focus will be the translation of laboratory discoveries into clinical applications.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 7200 Experimental Therapeutics II
[3 credit hours]
The course will expand upon material covered in Experimental Therapeutics I and focus on the drug development process. Practical applications include the design of in vitro and in vivo screens for drug activity, improvement of pharmacokinetic properties and integration of medicinal chemistry with pharmacology in a drug development paradigm.
Prerequisites: PHCL 5100 with a minimum grade of B- or PHCL 7100 with a minimum grade of B-
Term Offered: Spring

PHCL 7440 Current Topics in Interpretation of Pharmaceutical Data
[1 credit hour]
The basic statistical techniques learned in PHCL 4140/5140 will be further explored using research articles and real data sets to conduct statistical analyses. The use of different software programs will be used to provide students with hands-on practice in conducting statistical analyses.
Prerequisites: PHCL 5140 (may be taken concurrently) with a minimum grade of B-
Term Offered: Summer

PHCL 7460 Current Topics in Pharmacokinetics Toxicokinetics
[1 credit hour]
An advanced discussion of the theory and practice of using kinetic principles to model the time course of drugs and toxic chemicals in the body and in the environment. The student should understand the relationship between chemical time courses and outcomes and application to risk assessment. Additionally, students will gain hands-on practice using kinetic analysis methods and software.
Prerequisites: PHCL 4760 with a minimum grade of B- or PHCL 5760 (may be taken concurrently) with a minimum grade of B-
Term Offered: Spring, Fall

PHCL 7500 From Experimental to Applied Therapeutics
[4 credit hours]
The course focuses on bridging the gap between experimental and clinical applications of drugs. It will discuss groups of structurally related drugs designed to treat certain conditions, their basic molecular pharmacological action and how that is applied clinically. The course will also include discussing toxicity of some drugs and xenobiotics manufactured for certain applications, their basic molecular actions and their clinical toxicity.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 7770 Current Topics in Toxicology I
[1 credit hour]
The course focuses on the most recently published studies that cover advances in the field of toxicology, including risk assessment of toxic chemicals, toxicokinetics, chemically ¿induced mutations, cancer and developmental toxicity, toxic responses of various body systems to different chemicals and drugs, toxicity of pesticides and heavy metals.
Prerequisites: PHCL 4730 with a minimum grade of B- or PHCL 5730 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 8300 Research Experience in Experimental
[2-6 credit hours]
The course is intended for laboratory rotations to familiarize students with research topics in various clinical/basic science laboratories. A primary focus is to allow students to shadow, learn, experience and perform specific laboratory techniques.
Term Offered: Spring, Summer, Fall

PHCL 8390 Problems in Experimental Therapeutics
[1-6 credit hours]
The course will examine current topics and trends in the field of experimental therapeutics. The nature of the course will vary from student to student, depending on their background in the field, and the nature of their interest. For example, a new student may be assigned a literature search to identify papers that describe current approaches toward the treatment of human disease. A more advanced student might be given the task of researching and developing new laboratory techniques to initiate a research project. The overall goal will be to introduce students to current problems in experimental therapeutics, and help them identify an approach toward solving these problems.
Term Offered: Spring, Summer, Fall

PHCL 8650 Seminar in Experimental Therapeutics
[2 credit hours]
The course includes seminars presented by scientists from academia, industry and government who are invited by the department to speak about their research. Research subjects to be covered by the seminars are within the field of therapeutics and related areas, such as toxicology, molecular and genetic mechanisms in drug/chemical action, risk assessment, biomarkers and others.
Term Offered: Spring, Fall

PHCL 8960 Dissertation Research in Experimental Therapeutics
[1-15 credit hours]
The course entails laboratory and/or clinical research focused on the development of experimental therapeutics directed toward human disease. Students engaged in PH.D. dissertation research will identify a significant research problem and develop a strategy for addressing an area of unmet need. Together with the major advisor and dissertation committee members, the student will develop a research plan that addresses major questions in the chosen field using an hypothesis driven approach.
Term Offered: Spring, Summer, Fall

Pharmacy (PHM)

PHM 5000 Integrated Pharmaceutical and Clinical Sciences 1
[6 credit hours]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis and treatments. The course focuses on clinical laboratory tests and monitoring, hypertension, hyperlipidemia, diabetes and endocrine related disorders.
Prerequisites: MBC 5310 with a minimum grade of D- and PHCL 5700 with a minimum grade of D-
Corequisites: PHPR 5460
Term Offered: Spring

PHM 5100 Research in Pharmaceutical Science: Ethics & Methods
[3 credit hours]
Advanced consideration of scientific, ethical, and legal obligations expected in the conduct of research. Thereafter, an introduction to research methods and principles used in designing, planning, implementing, analyzing, and interpreting research projects in pharmaceutical sciences.
Term Offered: Spring, Summer

PHM 5110 Clinical Trials and Regulatory Affairs
[3 credit hours]
This course teaches the principles of clinical trials. This includes theoretical and practical applications of clinical trials as they apply to the drug approval process, and regulatory issues as they apply to human subjects research and the approval of drugs for use in humans.
Term Offered: Spring, Summer, Fall

PHM 6000 Integrated Pharmaceutical and Clinical Sciences 4
[7 credit hours]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of fluids, electrolytes and kidney disease, cardiology and gastrointestinal disorders.
Term Offered: Fall

PHM 6200 Integrated Pharmaceutical and Clinical Sciences 5
[5 credit hours]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of oncology and special populations related disorders.
Corequisites: PHPR 6470
Term Offered: Spring

PHM 6400 Physical and Mental Effects of Psychoactive Substances
[2 credit hours]
Pharmacology, pathophysiology, social impact of substance use, mis-use, and abuse and treatments available (pharmacological and non-pharmacological). Legal issues surrounding substance use, mis-use, and abuse will also be discussed.
Term Offered: Summer, Fall

PHM 6500 Integrated Pharmaceutical and Clinical Sciences 2
[8 credit hours]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of immunologic disorders, pharmacokinetic considerations and infectious diseases.
Prerequisites: MBC 5310 with a minimum grade of D- and PHCL 5700 with a minimum grade of D- and PHCL 6160 with a minimum grade of D- and PHM 5000 with a minimum grade of D-
Corequisites: PHPR 6350
Term Offered: Fall

PHM 6600 Integrated Pharmaceutical and Clinical Sciences 3
[8 credit hours]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of pulmonary hematologic, psychiatric, neurologic and pain and substance abuse disorders.
Prerequisites: MBC 5310 with a minimum grade of D- and PHCL 5700 with a minimum grade of D- and PHM 5000 with a minimum grade of D-
Corequisites: PHPR 6360

Pharmacy Practice (PHPR)

PHPR 5000 Residency and Postgraduate Training Preparation
[1 credit hour]
Instruction on the various aspects of obtaining a position within a pharmacy residency training program or other postgraduate training program.
Term Offered: Spring, Fall

PHPR 5010 Advanced Evidence Based Medicine
[2 credit hours]
This course expands upon the principles and practice of evidence based medicine (EBM) in guiding clinical decision making in pharmacy practice. This course emphasizes advanced concepts in drug literature evaluation and critique of landmark clinical trials.
Term Offered: Fall

PHPR 5020 Pharmaceutics and Dosage Form Design
[5 credit hours]
The lectures and labs in Pharmaceutics and Dosage Form Design have an overarching theme of drug product knowledge. Topics for the lectures and labs include drug product design, pharmaceutical calculations, and an emphasis on contemporary pharmacy compounding.
Term Offered: Fall

PHPR 5050 Interprofessional Approach to Patient Care
[1 credit hour]
This course is designed to prepare all health professions students to deliberately and constructively work together with the common goal of building a safer, better patient-centered and community/population-oriented U.S. health care system. Students will be assigned to small-group interprofessional teams and will interact and collaborate with students from other healthcare professions.
Term Offered: Fall

PHPR 5120 Essentials of U.S. Healthcare Delivery and Pharmacoeconomic Evaluation
[3 credit hours]
This course provides an in-depth understanding of the essential components of healthcare delivery in the United States, with a focus on pharmacoeconomic evaluation.
Term Offered: Spring, Summer, Fall

PHPR 5130 Managed Care Pharmacy
[3 credit hours]
The course will offer in-depth teaching and discussions on managed care pharmacy.
Term Offered: Fall

PHPR 5140 Introduction to Decision Analytic Modeling in Health Outcomes Research
[3 credit hours]
This course introduces students to the fundamental principles and applications of decision analytic modeling in health outcomes and pharmacoeconomic research. Students will learn how decision trees, Markov models, and related analytic frameworks are used to evaluate the clinical and economic impact of healthcare interventions. Emphasis is placed on conceptual understanding, model structure, and interpretation of results rather than software-based computation. The course prepares students to critically assess published models and to design conceptual models that inform healthcare decision-making and policy.
Term Offered: Spring

PHPR 5160 Real-World Data in Health Outcomes Research
[3 credit hours]
This course prepares students to evaluate health outcomes, comparative effectiveness, and health services research using real-world data (RWD) to generate real-world evidence (RWE). Students will gain knowledge of healthcare databases, regulatory frameworks, and methodological challenges associated with RWD. Over 7 weeks, students will explore the fundamentals of RWD and RWE, database types, Comparative Effectiveness Research (CER) study designs, analytical challenges, and global regulatory frameworks. Each week includes 2–3 modules followed by assessments such as quizzes, short assignments, case studies, or group discussions.
Term Offered: Spring

PHPR 5170 Foundations of Patient-Reported Outcomes (PRO) in Healthcare Research
[3 credit hours]
This course provides students with a conceptual understanding of patient-reported outcomes (PROs) and their role in evaluating healthcare interventions. The course focuses on the principles underlying the development, validation, and interpretation of PRO instruments without requiring prior statistical or programming expertise. Students will explore how PROs are used in clinical trials, regulatory submissions, and health outcomes research.
Term Offered: Fall

PHPR 5180 Machine Learning and AI in Health Outcomes
[3 credit hours]
This course introduces students to the application of machine learning (ML) and artificial intelligence (AI) techniques in the context of health outcomes research. Students will gain practical experience with ML algorithms and explore real-world healthcare data to develop predictive models and analyze outcomes.
Term Offered: Spring

PHPR 5190 Master of Science in Health Outcomes and Value Analytics (HOVA) Capstone
[3 credit hours]
This capstone course is the culminating experience for students in the MS in Health Outcomes and Value Analytics (HOVA). Under the direction of a faculty mentor, students will integrate and apply knowledge gained throughout the program to design and complete an independent research project addressing a relevant question in pharmacoeconomics, health technology assessment, or outcomes research.
Term Offered: Spring

PHPR 5250 Introduction to Self Care
[1 credit hour]
The course will provide an introduction to the over-the-counter marketplace and discussion of the pharmacist's patient care process. Special emphasis will be placed on how pharmacists should help patients safely and effectively treat common medical problems.
Prerequisites: PHPR 5450 with a minimum grade of D- or PHCL 5700 with a minimum grade of D-
Term Offered: Spring

PHPR 5260 Pharmacy and Healthcare Administration
[2 credit hours]
Description and analysis of the organization, financing and delivery of healthcare in the U.S.
Term Offered: Spring, Fall

PHPR 5300 DESIGN AND APPLICATIONS OF CANCER CHEMOTHERAPY
[1 credit hour]
In depth discussion of the principles of drug design and development within the framework of the pharmacotherapeutic management of cancer and cancer prevention.
Corequisites: MBC 5300
Term Offered: Fall

PHPR 5310 Introduction to Pharmacy Law
[1 credit hour]
The purpose of this course is to introduce students to laws that regulate the practice of pharmacy. Federal drug laws and specific state laws that regulate the filling and dispensing of prescriptions will be reviewed and applied.
Term Offered: Spring

PHPR 5320 Commonly Prescribed Meds and Med Term 1
[1 credit hour]
This course introduces students to commonly prescribed medications and medical terminology.
Term Offered: Fall

PHPR 5450 Pharmacy Skills Development-1
[2 credit hours]
This course is designed to introduce students to the Pharmacists' Patient Care Process as it is applied to the Community Pharmacy Setting in order to prepare them for their Community Pharmacy Introductory Pharmacy Practice Experiences.
Term Offered: Fall

PHPR 5460 Pharmacy Skills Development-2
[2 credit hours]
Building on competencies from prerequisite courses, this course is designed to enhance skills in the Pharmacists' Patient Care Process (PPCP) as they are applied to the Community Pharmacy Setting.
Prerequisites: PHPR 3450 with a minimum grade of D- or PHPR 5450 with a minimum grade of D-
Term Offered: Spring

PHPR 5520 Pharmaceutical Marketing and Management
[3 credit hours]
Introduction to administrative sciences (marketing/management, etc.) in the provision of pharmaceutical care. Topics include multicultural communication, operation of various pharmacy practice settings, barriers to health care access, facilitation of patient access to pharmaceutical care.
Term Offered: Spring

PHPR 5590 Readings in Access and Cultural Competence
[2 credit hours]
Examination of the literature related to access and cultural competence in the US health care system. Various types of readings will be used to analyze the relationships that exist between access, cultural competence and positive healthcare outcomes.
Prerequisites: PHPR 4520 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring, Summer

PHPR 5610 Pharmacoeconomics and Outcomes Research I
[2 credit hours]
This course emphasizes advanced concepts, methods, and practical procedures for pharmacoeconomic analysis and outcomes research. The student will learn through readings and experience assessment of patient health status, quality of life, satisfaction and cost-effectiveness for pharmacoeconomic and health outcomes research and interpretation of economic and outcomes data.
Term Offered: Spring

PHPR 5620 Pharmacoeconomics and Outcomes Research II
[3 credit hours]
This course emphasizes advanced concepts, methods and practical procedures for pharmacoeconomic analysis and outcomes research. The student will learn through readings and experience assessment of patient health status, quality of life, cost-effectiveness for pharmacoeconomic and health outcomes research and interpretation of economic and outcomes data.
Prerequisites: PHPR 5610 with a minimum grade of C
Term Offered: Fall

PHPR 5680 Parenteral Manufacturing
[2 credit hours]
The theory and technology of parenteral and ophthalmic formulation design, production, sterilization, packaging and stability.
Prerequisites: (PHPR 3010 with a minimum grade of D- and PHPR 3070 with a minimum grade of D-)
Term Offered: Fall

PHPR 5700 Equilibrium Phenomenon
[2 credit hours]
A theoretical and practical examination of the principles of chemical equilibrium and the techniques used in their calculation. Physical and chemical concepts focus on pharmaceutical systems as well as selected areas of chemistry.
Term Offered: Spring

PHPR 5710 Selected Topics In Pharmaceutical Technology
[2-3 credit hours]
Discussion, evaluation, experimentation and production of selected dosage forms. A forum for the discussion of new dosage form technology and advances.
Prerequisites: (PHPR 3010 with a minimum grade of D- and PHPR 3070 with a minimum grade of D-)
Term Offered: Spring, Summer, Fall

PHPR 5720 Pharmaceutical Rate Processes
[3 credit hours]
A theoretical and practical application of kinetic principles applied to pharmaceutic and cosmetic systems in liquid and solid state. A mathematical treatment and development of the equations which support each reaction mechanism.
Term Offered: Spring, Fall

PHPR 5770 Advanced Drug Delivery Systems – I
[3 credit hours]
The development of drug delivery systems relies on the broad understanding of many different physiological, chemical, and biological factors. This course is designed to introduce advanced drug delivery systems for oral, ocular, transdermal and buccal delivery. The course design is based on the premise that the student desires knowledge about the latest developments in formulation and drug delivery. Students may be required to design a project proposal for presentation.
Term Offered: Spring, Fall

PHPR 5800 Cosmetic Ingredients and Product Forms
[3 credit hours]
In-depth review of cosmetic ingredients, selection and formulation basics, and detailed discussion of product forms in the cosmetic industry.
Term Offered: Spring, Summer, Fall

PHPR 5810 FINANCE AND PERSONAL PLANNING FOR PHARMACISTS
[2 credit hours]
Practical topics on financial, professional, and personal situation to better prepare students to make knowledgeable decisions that affect future security and success. (Prerequisites: Third Professional Year PharmD or permission of instructor.)
Term Offered: Spring, Summer

PHPR 5820 Cosmetic Trends and Claims
[3 credit hours]
A detailed discussion of trends, certifications, and claims within the cosmetic industry for ingredients, finished products, and facilities.
Term Offered: Summer

PHPR 5830 Cosmetic Regulations, Ethics, and Practices
[3 credit hours]
In-depth review of laws and regulations governing the cosmetic industry, focusing on the United States. Legal and ethical considerations associated with ingredient selection and product formulation.
Term Offered: Spring

PHPR 5840 Formulating Skin and Sun Care Products
[3 credit hours]
Detailed discussion of the anatomy and physiology of the skin and its appendages. In-depth review of cosmetics and personal care products applied to the skin for cleansing, protection, and treatment. Main discussion points include product functions, ingredient selection, product design and formulation, and product testing.
Term Offered: Fall

PHPR 5850 Formulating Makeup, Hair Care, and Oral Care Products
[3 credit hours]
Detailed discussion of the anatomy and physiology of hair and the oral cavity. In-depth review of makeup products, hair care products, and oral care products. Main discussion points include product functions, ingredient selection, product design and formulation, and product testing.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Summer, Fall

PHPR 5860 Performance Evaluation Techniques
[3 credit hours]
In-depth review of analytical techniques and methodologies for the assessment of product performance on the hair, skin, and nails.
Term Offered: Fall

PHPR 5870 Compounding Boot Camp
[2 credit hours]
This course is a companion to the Professional Compounding Center of America Boot Camp held at the college every year. Students will complete the boot camp lab experience and work through cases and webinars and other problem solving exercises to master techniques for creating new dosage forms.
Prerequisites: PHPR 3080 with a minimum grade of D-
Term Offered: Summer, Fall

PHPR 5910 Drug-Induced Diseases
[1 credit hour]
An elective course that examines the epidemiology, public impact, contributing factors and causes for various Drug-Induced Diseases. This course will also examine Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacotherapy, to study the etiology, pathophysiology, clinical presentation, diagnosis, and treatment Drug-Induced Diseases.
Term Offered: Spring, Fall

PHPR 5920 Introductory Pharmacy Practice Experience I
[1 credit hour]
First professional year course designed to enhance professional growth through an introduction to clinical skill development and direct patient care activities within institutional and community pharmacy practice settings. Prerequisite: Admission into the Pharm.D. Program.
Term Offered: Spring, Summer, Fall

PHPR 5930 Introductory Pharmacy Practice Experience 2
[1 credit hour]
First professional year course designed to enhance professional growth through an introduction to clinical skill development and direct patient care activities within institutional and community pharmacy practice settings. Prerequisite: Admission into the Pharm.D Program.
Prerequisites: PHPR 3920 with a minimum grade of C or PHPR 5920 with a minimum grade of C
Term Offered: Spring

PHPR 5940 Managed Care Pharmacy Elective
[1 credit hour]
The course will offer in-depth teaching and discussions on managed care pharmacy.
Term Offered: Fall

PHPR 5960 Advocacy in the Pharmacy Profession
[1 credit hour]
The purpose of the course is to teach participants about the role and process of legislative advocacy in the pharmacy profession. Students will learn basic principles of legislative advocacy and contemporary issues in the profession of pharmacy. The course will have a hybrid delivery format with most sessions being delivered in an asynchronous, virtual manner. Students will be required to attend Advocacy Awareness Day in Columbus, date TBD. Travel details will be at the expense of the student (transportation and meals).
Term Offered: Fall

PHPR 5990 Problems In Pharmacy Practice
[1-6 credit hours]
Tutorial or directed, individual research problems in administrative pharmacy, or other related fields.
Term Offered: Spring, Summer, Fall

PHPR 6000 Drug Information Seminar
[2 credit hours]
An advanced seminar course which applies evidence based medicine through literature searching, drug literature evaluation skills, and formal writing and presentation skills to complete a written literature summary and patient population based therapeutic recommendation, as well as a verbal presentations such as case presentations, disease state and pharmacotherapy reviews and other topic discussions.
Term Offered: Spring, Fall

PHPR 6010 Leadership and the Military Healthcare Professional
[2 credit hours]
This two-part online course will cover various advanced leadership discussions and topics, including continuous process improvements, management, followership, difficult conversations/feedback, as well as the development of teams and individuals, and the personal leadership philosophy. Students will be able to apply these skills using real-world applications by performing a continuous process improvement (CPI) project, delivering feedback, and interacting weekly with their classmates in various discussions. Additionally, students will explore the military healthcare system and the role of the healthcare professional in a variety of topics, including readiness, emergency management, deployments, leading/managing personnel, designing programs, and responding to biological/chemical/radioactive/nuclear events (CBRNE). These topics will be discussed in a manner that all students can understand regardless of their professional program or background.
Term Offered: Spring

PHPR 6150 Introduction to Pharmacy Informatics
[2 credit hours]
This course provides students with a comprehensive introduction to pharmacy informatics and its impact on clinical practice. Students will examine how pharmacists use health information technology (HIT) to optimize medication use, enhance patient safety, and support clinical decision-making. Designed with a focus on real-world application, this course emphasizes the pharmacist's role in implementing and optimizing informatics tools.
Term Offered: Spring

PHPR 6200 Patient Centered Care
[2 credit hours]
This course focuses on learning various aspects of Patient Centered Care including: Medication Therapy Management (MTM) services, Motivational Interviewing, Patient Assessment, and Cultural Competence.

PHPR 6220 Pharmacoeconomics and Outcomes Research
[1 credit hour]
This course allows students to gain and expand their knowledge base in areas such as application of pharmacoeconomic and effectiveness measures to the practice of health care.
Term Offered: Fall

PHPR 6250 Advanced Self Care
[3 credit hours]
The course will discuss issues surrounding the self-medication decision-making process. Special emphasis will be placed on how pharmacists should help patients safely and effectively treat common medical problems. The course will provide information about how pharmacists should educate and counsel patients about diagnostic tests that the public can purchase without a prescription.
Term Offered: Spring

PHPR 6260 PHCAD-3
[1 credit hour]
The course will offer in depth teaching and discussions on human resource management, inventory control, and organizational financial management in the respective practice settings.
Prerequisites: PHPR 4520 with a minimum grade of D-
Term Offered: Fall

PHPR 6270 Business Aspects of Pharmacy
[2 credit hours]
This course will provide students with a foundation in the business aspects of the practice of pharmacy and their important role in the provision of pharmaceutical care.

PHPR 6280 PHCAD-4
[2 credit hours]
This course focuses on developing, implementing, and evaluating Medication Therapy Management (MTM) and Disease State Management (DSM) programs.
Prerequisites: PHPR 6260 with a minimum grade of D-
Term Offered: Spring

PHPR 6310 Jurisprudence and Ethics
[1 credit hour]
Discussion of federal, state and local laws affecting the profession and practice of pharmacy. Ethical principles involved in patient care will be reviewed and applied.
Term Offered: Spring

PHPR 6330 Health Systems
[1.5 credit hours]
This course will provide an overview of the organization, financing and delivery of healthcare in the U.S.
Term Offered: Spring

PHPR 6340 RESEARCH DESIGN AND DRUG LITERATURE EVALUATION 2
[2 credit hours]
Concepts of research design, statistical analysis, drug literature evaluation and evidence based medicine are expanded from PHPR 4330 to depict their practical relevance to pharmacy practice.
Prerequisites: PHPR 4330 with a minimum grade of D-
Corequisites: PHPR 6070
Term Offered: Fall

PHPR 6350 Pharmacy Skills Development - 3
[2 credit hours]
Building on competencies from prerequisite courses, this course is designed to enhance skills in the Pharmacists' Patient Care Process (PPCP) as they are applied to the Community and Ambulatory Care Pharmacy settings.
Prerequisites: PHPR 5460 with a minimum grade of D-
Corequisites: PHPR 6200
Term Offered: Fall

PHPR 6360 Pharmacy Skills Development - 4
[2 credit hours]
Building on competencies from prerequisite courses, this course is designed to enhance skills in the Pharmacists' Patient Care Process (PPCP) as they are applied to the Institutional Pharmacy setting.
Prerequisites: PHPR 6350 with a minimum grade of D- and PHPR 6540 with a minimum grade of D-
Term Offered: Spring

PHPR 6390 Commonly Prescribed Meds and Med Term II
[1 credit hour]
This course introduces students to commonly prescribed medications and medical terminology.
Prerequisites: PHPR 5320 with a minimum grade of D-
Corequisites: PHPR 6350
Term Offered: Fall

PHPR 6400 Topics in Internal Medicine
[2 credit hours]
This course is designed to focus on complex and/or controversial pharmacotherapy topics and the evaluation of primary literature and guidelines to promote effective abilities in evaluating, selecting, and recommending pharmacotherapeutic regimens, and educating patients and health care professionals utilizing the principles of evidence based decision making.
Term Offered: Spring, Summer

PHPR 6410 Leadership: Principles and Practice
[2 credit hours]
This course will facilitate student self-discovery first and foremost. Through reflection activities, and discussion students will learn about themselves, the idea of leadership, and how they relate to others. This is not a passive process. Students are expected to actively participate in the course to get the most out of it. The course is meant to help students take a critical look at their relationships with others by answering the following questions; 1) how am I a problem for others? 2) how can I be more helpful to others? 3) how can I help things go right?
Term Offered: Spring, Summer, Fall

PHPR 6460 Pharmacy Skills Development - 5
[2 credit hours]
This advanced course will enhance confidence in application of knowledge and skills to prepare students for competent participation in the Pharmacists Patient Care Process and transitions of care in Advanced Pharmacy Practice Experiences.

PHPR 6470 Pharmacy Skills Development - 6
[2 credit hours]
This course is designed to further develop fundamental skills in the Pharmacists Patient Care Process and to enhance confidence in clinical skills necessary for roles in transitions of care.
Term Offered: Spring

PHPR 6480 Exploring Novel Careers in Pharmacy
[1 credit hour]
This course will introduce students to novel careers in the pharmacy profession. This course will also increase student awareness of careers that can be pursued with a PharmD degree. Students will hear from guest speakers in current novel career positions and have the opportunity to interact with the speakers during a Q&A session.
Term Offered: Spring, Fall

PHPR 6520 Analysis Of The Pharmaceutical Environment
[2 credit hours]
A theoretical and practical examination of the pharmaceutical environment and drug distribution system using administrative pharmacy sciences as a tool for analysis.
Prerequisites: PHPR 4520 with a minimum grade of D-
Term Offered: Spring, Fall

PHPR 6530 Research Methods In Pharmacy Practice
[2 credit hours]
An introduction to research methods and principles used in designing, planning, implementing, analyzing and interpreting research projects in pharmacy practice.
Term Offered: Spring, Fall

PHPR 6540 Evidence Based Medicine 1
[3 credit hours]
This course introduces the principles and practice of evidence based medicine (EBM) in guiding clinical decision making in pharmacy practice.
Term Offered: Fall

PHPR 6560 Evidence Based Medicine 2
[2 credit hours]
This course expands upon the principles and practice of evidence based medicine (EBM) in guiding clinical decision making in pharmacy practice. Students will develop their formal oral presentation skills.
Prerequisites: PHPR 6540 with a minimum grade of D-
Corequisites: PHPR 6360
Term Offered: Spring

PHPR 6600 Seminar In Administrative Pharmacy
[1 credit hour]
A critical analysis of current problems in pharmacy practice with individual case presentations.
Prerequisites: MBC 5310 with a minimum grade of D- and PHCL 5700 with a minimum grade of D- and PHM 5000 with a minimum grade of D-
Corequisites: PHPR 6360
Term Offered: Spring, Fall

PHPR 6700 Special Topics in Diabetes Care
[2 credit hours]
This course focuses on advanced and special population topics in the area of diabetes care and management through discussions, lecture-based teaching and group activities.
Term Offered: Fall

PHPR 6710 Skin Delivery of Cosmetic Actives
[3 credit hours]
Advanced study of skin delivery concepts and methods with a special focus on cosmetic actives.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Spring

PHPR 6720 Global Cosmetic Regulations
[3 credit hours]
Detailed discussion of global cosmetic, personal care, and OTC-drug cosmetic regulations focusing on claim substantiation, manufacturing, packaging, advertising, and testing.
Prerequisites: PHPR 5800 with a minimum grade of C and PHPR 5830 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PHPR 6730 Sustainable Product Development
[3 credit hours]
An overview of the socio-economic demand for sustainable products and how it is shaping the behavior and practices of both consumers and manufacturers alike in cosmetic/personal care product development.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PHPR 6740 Skin Microbiome
[3 credit hours]
An in-depth review of the skin microbiome, product claims and labeling, and the future of skin health.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PHPR 6750 Cosmetic Science Formulation Lab
[3 credit hours]
A laboratory course that focuses on cosmetic and personal care product formulation and testing basics.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Spring, Summer

PHPR 6770 Cosmetic Science Project
[3 credit hours]
An independent research project requiring students to synthesize their knowledge gained in previous coursework and create potential solutions for a real-life concept or problem.
Prerequisites: PHPR 5800 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PHPR 6850 Product Development Laboratory
[2 credit hours]
A study of various stages of development of pharmaceutical products. The student will develop formulations, using stability data and production technology for three products.
Prerequisites: PHPR 5690 with a minimum grade of D-
Term Offered: Spring

PHPR 6860 Advanced Drug Delivery Lab
[2 credit hours]
This lab course is designed to provide students hands-on experience and improve their practical knowledge in areas of industrial pharmacy and advanced pharmaceutics. This course would introduce students to the wide range of cutting-edge techniques in the pharmaceutical industry.
Term Offered: Spring, Fall

PHPR 6920 Introductory Pharmacy Practice Experience 5
[1 credit hour]
Third professional year course designed to enhance professional growth through application of skills and knowledge gained in IPPE-3 and IPPE-4 to various areas of pharmacy practice to provide the best possible patient care.
Term Offered: Fall

PHPR 6930 Introductory Pharmacy Practice Experience 3
[1 credit hour]
The purpose of this course is to increase students' awareness and involvement in areas related to the contemporary practice of pharmacy. Students will participate in projects that nurture their professional growth.
Prerequisites: PHPR 3930 with a minimum grade of C or PHPR 5930 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PHPR 6950 Seminar In Industrial Pharmacy
[1 credit hour]
A seminar course composed of graduate student presentations on their research and special topics as well as outside speakers from both the community and pharmaceutical industry.
Term Offered: Spring, Summer, Fall

PHPR 6960 M.S. Thesis Research In Pharmacy
[1-6 credit hours]
Advanced and in-depth study of an issue pertinent to contemporary pharmacy practice. Part of degree requirement for M.S. in Pharmaceutical Sciences.
Term Offered: Spring, Summer, Fall

PHPR 6970 Introductory Pharmacy Practice Experience 4
[1 credit hour]
The purpose of this course is to increase students' awareness and involvement in areas related to the contemporary practice of pharmacy. Students will participate in projects that nurture their professional growth.
Prerequisites: PHPR 4920 with a minimum grade of C or PHPR 6930 with a minimum grade of D-
Term Offered: Spring, Summer

PHPR 6980 Special Topics
[1-5 credit hours]
Selected study of topics in Pharmacy Practice. New pharmacy and healthcare strategies are examined in detail.
Term Offered: Spring, Summer, Fall

PHPR 8940 Clinical Clerkship
[4 credit hours]
The APPE sequence is a fulltime onsite clinical experience designed to allow students to apply knowledge and skills gained in the didactic and IPPE curriculum. The APPE sequence consists of 9 fulltime (40 hour per week) rotations.
Term Offered: Spring, Summer, Fall

PHPR 8980 Special Topics
[1-5 credit hours]
Selected study of topics in Pharmacy Practice. New Pharmacy and healthcare strategies are examined in detail.
Term Offered: Spring, Summer, Fall

Pharmocology HSC (PHRM)

PHRM 8200 Read Mechanism Hormone Actio
[0-4 credit hours]
The properties of hormone receptors and the biochemical consequences of hormone-receptor interactions. May be repeated for credit.
Term Offered: Fall

Philosophy (PHIL)

PHIL 5010 Islamic Law and Society
[3 credit hours]
This course will survey Islamic law in historical and comparative modern contexts. This course will provide (a) basic introduction to the sources and methods of classical Islamic legal interpretation, (b) survey of the most pressing areas in which traditional Islamic norms remain relevant today—criminal law, family law, and commercial law, (c) the challenges and transformations introduced by colonialism, modernity, and the nation-state, and (d) comparison with the American law and the constitution, highlighting comparative interpretive methods such as originalism versus progressivism, and innovative dimensions of Islamic law such as legal pluralism, wide room for local custom, religious diversity, and restorative justice.
Term Offered: Spring

PHIL 5210 Ancient Philosophy Seminar
[3 credit hours]
An intensive study of the texts and arguments of Presocratic philosophers, Plato, Aristotle, or Hellenistic philosophers. Course may be repeated as topics vary.
Term Offered: Spring, Fall

PHIL 5230 Modern Philosophy Seminar
[3 credit hours]
An intensive study of one or more Continental or British philosophers from the sixteenth through eighteenth centuries. Course may be repeated as topics vary.
Term Offered: Spring, Fall

PHIL 5240 19th Century European Philosophy
[3 credit hours]
An intensive study of European philosophy after Kant, including Hegel, Marx, Kierkegaard and Nietzsche.
Term Offered: Spring, Fall

PHIL 5250 Phenomenology
[3 credit hours]
An intensive study of major works from phenomenological philosophers, such as Husserl, Heidegger, Sartre, or Merleau-Ponty. Course may be repeated as topics and texts vary.
Term Offered: Spring, Fall

PHIL 5260 Recent European Philosophy
[3 credit hours]
An examination of texts and problems in the Frankfurt School, post-structuralism, deconstruction, post-modernism, or of such thinkers as Habermas, Foucault, Derrida and Lyotard. Course may be repeated as topics vary.
Term Offered: Spring, Fall

PHIL 5270 American Philosophy
[3 credit hours]
A study of the development of American philosophy, or of one or more of Pierce, James, Dewey, or Mead. Course may be repeated as topics vary.
Term Offered: Fall

PHIL 5280 20th Century Analytic Philosophy
[3 credit hours]
Selected readings from Frege, the Russell, Wittgenstein, the Vienna Circle, the Ordinary Language school and American neopragmatists such as Quine, Rorty and Davidson. Course may be repeated as topics vary.
Term Offered: Spring, Fall

PHIL 5300 Philosophy Of Natural Science
[3 credit hours]
A study of scientific inquiry including the structure of scientific explanations, relation of evidence and confirmation, the metaphysics of theoretical entities, and the nature of scientific change and progress.
Term Offered: Spring, Fall

PHIL 5400 Ethics Seminar
[3 credit hours]
Selected topics or philosophers in ethical theory. Course may be repeated as topics vary.
Term Offered: Spring

PHIL 5650 Philosophy Of Mind
[3 credit hours]
Advanced study of issues in the philosophy of mind such as: intentionality and misrepresentation, rationality and interpretation, supervenience and reductionism, folk psychology and eliminative materialism. Course may be repeated as topics vary.
Term Offered: Spring

PHIL 5750 Political Philosophy Seminar
[3 credit hours]
Selected topics or philosophers in political philosophy. Course may be repeated as topics vary.
Term Offered: Spring, Fall

PHIL 5920 Readings In Philosophy
[3 credit hours]
Critical inquiry into selected works of a particular philosopher or a specific philosophical problem.
Term Offered: Spring, Fall

PHIL 5990 Independent Study
[1-3 credit hours]
Directed study in philosophy under supervision of a philosophy faculty member.
Term Offered: Spring, Summer, Fall

PHIL 6000 Advanced Logic
[3 credit hours]
A study of propositional and predicate logic, as well as examination of issues in the philosophy of logic.
Term Offered: Spring, Fall

PHIL 6800 Proseminar
[1-6 credit hours]
Participation in departmental faculty-graduate student colloquia and mentoring program. Credit will carry the grade of S or U, and will not count toward credit hour requirements for the M.A. degree.
Term Offered: Spring, Fall

PHIL 6960 Thesis
[1-16 credit hours]

Physical Therapy (PHYT)

PHYT 5000 Gross Anatomy
[5 credit hours]
Students will study the structure of the human body using the structure-function relationship as the course paradigm. Musculoskeletal, vascular, and peripheral nervous system anatomy will be emphasized, as will the coordinated role of these structures, both locally and regionally, in producing movement of the axial skeleton and extremities. Competencies serve as a foundation for clinical science coursework, particularly in the musculoskeletal and neuromuscular areas of practice.
Term Offered: Summer

PHYT 5020 Lifespan I
[2 credit hours]
The first of two, this course examines typical lifespan development from birth to adolescence. Emphasis is on theoretical constructs, gross motor development, physical therapy examination, diagnosis, prognosis and evaluation of findings. Also includes an overview of fine motor development, cognitive development, reflex development, interaction with families, public laws and child abuse.
Term Offered: Summer

PHYT 5050 Analysis of Movement I
[2 credit hours]
This is the first of two courses that will integrate anatomy and biomechanics in order to gain an understanding of normal and abnormal human movement. In this course, foundational concepts will be introduced including biomechanical principles and tissue and muscle mechanics and applied to understanding movement of the upper extremity joints.
Term Offered: Summer

PHYT 5060 Analysis of Movement II
[3 credit hours]
This is the second of two courses that will integrate anatomy and biomechanics in order to gain an understanding of normal and abnormal human movement. In this course biomechanical principles of human movement will be reviewed and applied to understanding movement of the spine, pelvis, and lower extremity joints. Concepts of human movement analysis will be introduced and applied to common functional movements such as standing, transferring, walking, stair negotiation, and running.
Prerequisites: PHYT 5000 with a minimum grade of C and PHYT 5050 with a minimum grade of C and PHYT 5350 with a minimum grade of C
Term Offered: Fall

PHYT 5090 Neuroscience
[5 credit hours]
An introduction to the nervous system, including fundamental concepts in neuroanatomy and neurophysiology as they relate to human movement and basic bodily function mediated by the central and peripheral nervous systems. Emphasis is placed on the effects of neurological conditions (disease, injury, mental illness) relevant to physical therapy and functional performance. Basic clinical assessment skills of neurological impairments will integrate neuroscience information with clinical practice.
Term Offered: Spring

PHYT 5110 Clinical Pathophysiology I
[3 credit hours]
Integrated study of physiological and pathophysiological processes that influence the human body at the cellular, organ and systemic levels. Emphasis on mechanisms of and clinical manifestations of common diseases with discussion of potential impact on the delivery of PT services. Content to serve as the basis for discussion of pharmacology in subsequent courses.
Term Offered: Fall

PHYT 5120 Clinical Pathophysiology II
[1 credit hour]
Second of 2 courses that address the integrated study of normal physiological and pathophysiological processes in human body at cellular, organ, and systemic levels - emphases on clinical manifestations and impact on PT plan of care.
Term Offered: Summer

PHYT 5130 Evidence Informed Practice
[4 credit hours]
Introduction to the principles of measurement and research design, with an emphasis on critically evaluating the design of research studies relevant to clinical practice.
Term Offered: Fall

PHYT 5270 Applied Exercise Physiology
[3 credit hours]
Exploration of exercise physiology principles as related to promotion of PT patients/clients' health and wellness. Emphasizes physiological and biochemical changes with exercise/training and exercise testing and prescription for PT patients/clients.
Term Offered: Spring

PHYT 5280 Therapeutic Interventions I
[2 credit hours]
The theory and practice of physical therapy in the acute care setting as it relates to improvement of functional mobility, prevention of complications, and preparation for next level of care.
Term Offered: Spring

PHYT 5290 Therapeutic Interventions II
[2 credit hours]
Study of the theoretical basis for, and the application of thermal, mechanical, and electrical modalities used for the PT management of clients. Emphasis is on evidence-based practice, critical thinking, and clinical decision-making using a case-based format, and review of the scientific literature will be used in determining the most appropriate use of modalities within a comprehensive PT plan of care.
Term Offered: Summer

PHYT 5300 Principles of Therapeutic Exercise
[2 credit hours]
Application of scientific principles in anatomy, applied biomechanics, and exercise physiology to develop sound therapeutic exercise procedures. Emphasis on development of skills associated with therapeutic exercise for patients with musculoskeletal and/or general movement dysfunction. Students will learn how to use and apply a variety of common fitness and rehabilitation exercise apparatus and develop appropriate PT treatment plans that include exercise for a given patient problem.
Term Offered: Spring

PHYT 5350 Introduction to Examination
[2 credit hours]
Introduction to the physical examination process, including history-taking, systems review and screening. Emphasis on basic PT examination skills of the cardiovascular, musculoskeletal, and integumentary systems. Skills include: assessment of tolerance to functional activity (vital signs), posture, pain, peripheral pulses and edema; goniometry; and strength testing.
Term Offered: Summer

PHYT 5450 Foundations of Physical Therapy
[2 credit hours]
Addresses the professional socialization process. Professional codes and guides of behavior will be discussed in relation to delivery of competent, ethical, legal and compassionate PT services. Topics include: therapeutic communication, cultural competency, stress management and conflict resolution. Introduction to basic principles of teaching and learning for the role of educator is included.
Term Offered: Fall

PHYT 5650 Pharmacology of Physical Therapy
[1 credit hour]
Integrated study of pharmacology that presents the pharmacodynamics and pharmacotherapeutics of common classes of drugs. Drugs covered include: anti-inflammatory, analgesic, muscle relaxant, psychotropic, anti-microbial, and diabetic medications. Emphasis on indications, contraindications, adverse drug reactions, and the implications for physical therapy care.
Term Offered: Summer

PHYT 5750 Clinical Reasoning
[1 credit hour]
Introduction to theoretical models that guide clinical decision making, including patient management, clinical reasoning, disablement, and evidence-based practice models. Documentation will be discussed as a tool to aid clinical reasoning.
Term Offered: Spring

PHYT 5850 Clinical Education Experience I
[3 credit hours]
The first in a series four full-time, supervised clinical education experiences. Students are engaged in supervised practice in a 6-week integrated clinical education experience that emphasizes the early phases of development toward entry-level PT competencies in professional practice and patient management in either an inpatient or outpatient practice setting.
Term Offered: Summer

PHYT 5900 Medical Imaging
[2 credit hours]
This course provides the student with the tools needed to interpret information obtained from the radiology report and apply it to management of the physical therapy patient. Musculoskeletal imaging is emphasized, but imaging for other body systems is also addressed. This course strengthens the student's competency to perform a comprehensive patient evaluation, establish a diagnosis and prognosis, develop a physical therapy plan of care, and to communicate and collaborate with other health care providers.
Term Offered: Spring

PHYT 6020 Lifespan II
[2 credit hours]
The principles of normal aging including the physiological, functional, and psychosocial changes associated with aging, and a review of diseases and disorders common to the aging population.
Term Offered: Fall

PHYT 6100 Health Promotion
[2 credit hours]
Discussion and application of the elements of health and wellness as described by Healthy People 2020. Emphasis on health assessment, obesity, physical activity, nutrition, complementary/alternative management, and behavior modification strategies.
Term Offered: Spring

PHYT 6170 Scholarly Project I
[2 credit hours]
This course is intended to examine a physical therapy relevant question in a systematic and scholarly manner.
Term Offered: Summer

PHYT 6180 Scholarly Project II
[2 credit hours]
This course is intended to explore physical therapy practice with the aim of creating new knowledge in a systematic and scholarly manner.
Term Offered: Spring

PHYT 6260 Cardiovascular-Pulmonary Physical Therapy
[3 credit hours]
Integrative study of the role of PT in interdisciplinary management of patients with cardiovascular and/or pulmonary dysfunction. Application of skills associated with PT examination, evaluation, diagnosis, prognosis and interventions for patients with CV-P dysfunction.
Term Offered: Fall

PHYT 6460 Education in Healthcare
[2 credit hours]
Study of a physical therapist's role as educator of peers, patients and families, community members, and students in the clinical setting. Emphasis on instructional design, instructional strategies, teaching methods, and evaluation of learning.
Term Offered: Fall

PHYT 6500 Musculoskeletal Rehab I
[3 credit hours]
First of two courses, focused on the synthesis of principles of pathophysiology and screening and examination of musculoskeletal system. Emphasis on pertinent special examination techniques, principles of evaluation, PT diagnosis and prognosis, and intervention for the upper and lower extremities. Case-based discussion of role of common M-S pharmacological management, radiographic procedures and findings, and interpretation of special tests for diagnostic purposes.
Term Offered: Fall

PHYT 6510 Musculoskeletal Rehab II
[3 credit hours]
Second of two courses, continued discussion of the principles of pathophysiology and musculoskeletal examination, evaluation, PT diagnosis and prognosis, and intervention. Emphasis on spine and lower quarter biomechanical examination and evaluation as it relates to lumbopelvic dysfunction. Includes discussion of: pharmacological management of inflammation and pain, and synthesis of radiological findings (radiographs, MRI, CT scans), as they relate to rendering PT diagnosis and prognosis.
Term Offered: Spring

PHYT 6600 Neuromuscular Rehab I
[3 credit hours]
The first of two courses that will integrate evidence-based rehabilitation concepts into the management of patients with common neuromuscular diseases. Contemporary theories of neurological rehabilitation, motor control, and motor learning are integrated with therapeutic exercise to address common impairments in clients. Examination, evaluation, plan of care development, and interventions for clients with cerebrovascular accident (stroke), spinal cord injury, and traumatic brain injury are emphasized.
Term Offered: Fall

PHYT 6610 Neuromuscular Rehab II
[3 credit hours]
Second course in the series on rehabilitation of patients with neuromuscular diagnoses, including amputations, and neurodegenerative diseases. Emphasis on theories, philosophies, and the PT plan of care including examination, evaluation, and intervention strategies. Prostheses and orthoses prescription, application and training included.
Term Offered: Spring

PHYT 6620 Pediatric Rehabilitation
[2 credit hours]
Principles of rehabilitation for pediatric clients with neuromuscular impairments and developmental disabilities. Preparation for physical therapy practice in pediatric settings using interdisciplinary family-centered practice; normal and abnormal development, standardized assessment, service-delivery settings, interventions, management strategies specific to pediatrics. Emphasis on essential pediatric core competencies and the PT Management including examination, evaluation, diagnosis/prognosis, and intervention strategies.
Term Offered: Spring

PHYT 6700 Professional Issues
[1 credit hour]
Discussion of current events and issues faced by the profession of physical therapy as identified by the APTA and other pertinent sources, and as encountered during clinical education experiences.
Term Offered: Summer

PHYT 6720 Special Topics in Physical Therapy I
[2 credit hours]
Intensive exploration of a topic related to physical therapy service delivery in advanced practice. The content of this course serves to deepen the student's study of clinical management in select topics.
Term Offered: Spring, Summer

PHYT 6730 Special Topics in Physical Therapy II
[2 credit hours]
Intensive exploration of topics related to physical therapy service delivery in advanced practice. The course is designed to meet the student's special interests and professional goals. The content of this course serves to deepen the student's study of clinical management in select topics
Term Offered: Spring

PHYT 6740 Clinical Seminar I
[2 credit hours]
The first of a series of two courses, this course emphasizes the application of clinical psychomotor skills, problem-solving and critical thinking for a variety of diagnoses and practice settings using patient scenarios including patients with movement dysfunction involving multiple body systems. An emphasis is placed on evidence-based decision-making, comprehensive evaluation, progressive intervention planning, and evaluation of one's own clinical reasoning processes and skills.
Term Offered: Fall

PHYT 6750 Clinical Seminar II
[2 credit hours]
The second of a series of two courses, this course emphasizes the application of clinical psychomotor skills, problem-solving and critical thinking for a variety of diagnoses and practice settings using patient scenarios including patients with movement dysfunction involving multiple body systems. An emphasis is placed on evidence-based decision-making, comprehensive evaluation, progressive intervention planning, and evaluation of one's own clinical reasoning processes and skills.
Term Offered: Spring

PHYT 6850 Clinical Education Experience II
[5 credit hours]
The second in a series of four full-time, supervised clinical education experiences. Students are engaged in supervised practice in a 10 week clinical education experience that emphasizes development toward entry-level PT competencies in professional practice and patient management in an inpatient or outpatient practice setting.
Term Offered: Summer

PHYT 7050 Practice Management
[2 credit hours]
Examination of management and supervisory issues encountered in contemporary physical therapy practice. Discussion will include identification, analysis, and resolution of issues that compromise the delivery of effective and efficient PT services in a variety of practice settings. Topics include: organizational structure and behavior, human resources, finance and operations management, and marketing.
Term Offered: Fall

PHYT 7320 Medical Screening
[1 credit hour]
Preparation to work within a collaborative medical model and application of threshold detection to recognize and identify impairments or "red flags" in medical screening that warrant contact with a physician or other health care provider. Patient cases illustrate important medical screening principles. Emphasis on an examination scheme to promote efficient, effective patient data collection and professional communication with patients, physicians and other health providers.
Term Offered: Summer

PHYT 7890 Clinical Education Experience III
[4 credit hours]
The third in a series of four full-time, supervised clinical education experiences. Students are engaged in supervised practice in a 8-week terminal clinical education experience that emphasizes development toward entry-level PT competencies in professional practice and patient management in an inpatient or outpatient practice setting.
Term Offered: Summer

PHYT 7900 Clinical Education Experience IV
[6 credit hours]
The fourth in a series of four full-time, supervised clinical education experiences. Students are engaged in supervised practice in a 12 week terminal clinical education experience that emphasizes development of entry-level PT competencies in professional practice and patient management in an inpatient, outpatient or specialized practice setting.
Term Offered: Spring, Fall

Physician Assistant (PHYA)

PHYA 5010 Introduction to PA Profession
[1 credit hour]
The purpose of this course is to provide an overview of the physician assistant (PA) profession, including its history, development, and current role within the U.S. healthcare system. Students will be introduced to the philosophy of team-based, patient-centered care and the scope of practice of the PA. Core topics include the evolution of the profession, professional organizations, certification and licensure, and emerging trends shaping the future of healthcare delivery. Learning activities and evaluation methods will include lectures, case-based discussions, student presentations, and a final exam.
Term Offered: Fall

PHYA 5100 Principle Interview/Medical History
[2 credit hours]
An introduction to the art of patient/practitioner communication and effective interviewing for the purpose of establishing a health database and follow-up care.
Term Offered: Fall

PHYA 5130 Patient Evaluation
[4 credit hours]
Students will develop the knowledge and skills to perform a complete physical examination competently, recognizing normal and abnormal findings and communicating their findings verbally and in written form.
Term Offered: Spring

PHYA 5140 Health Care Teams and Systems
[2 credit hours]
Introduction to issues and systems related to the delivery of health care in the U.S. to include settings, costs, and reimbursement issues and the evaluation of health care quality.
Term Offered: Fall

PHYA 5210 Diagnostic and Therapeutic Skills I
[2 credit hours]
Introduction to the use and interpretation of commonly used diagnostic and therapeutic tools, including laboratory studies, radiographic studies, and electrocardiography.
Term Offered: Spring

PHYA 5220 Diagnostic and Therapeutic Skills II
[4 credit hours]
Introduction to the use and interpretation of commonly used diagnostic and therapeutic tools, with practical experience in radiology, including laboratory studies, radiographic studies, and electrocardiography.
Term Offered: Summer

PHYA 5230 Diagnostic and Therapeutic Skills III
[5 credit hours]
This is the third module of this 3-semester course and will combine lecture and laboratory experiences. Lectures will typically be given by the course instructor or a clinical expert on that topic. In-class / online learning (lecture) will be supplemented by laboratory skills work, Blackboard, self-study topics, supplemental required reading, and proficiency testing in this course. Among other topics, this course will focus on phlebotomy, intravenous catheterization, injection techniques, urinary catheterization, nasogastric intubation, suturing and knot tying, arterial puncture, endotracheal intubation, chest catheter, gowning and gloving, Ultrasound FAST Examination, and immobilization techniques.
Term Offered: Fall

PHYA 5310 Clinical Medicine I
[5 credit hours]
An intensive, three semester sequence of study which examines human diseases and disorders from the perspectives of etiology, epidemiology, clinical manifestations, diagnosis, management, potential complications and prognosis.
Term Offered: Spring

PHYA 5330 Clinical Medicine III
[6 credit hours]
An intensive, three semester sequence of study which examines human diseases and disorders from the perspectives of etiology, epidemiology, clinical manifestations, diagnosis, management, potential complications, and prognosis.
Term Offered: Fall

PHYA 5340 Clinical Medicine II
[5 credit hours]
Part 2 of an intensive, three semester sequence of study which examines human diseases and disorders from the perspectives of etiology, epidemiology, clinical manifestations, diagnosis, management, potential complication and prognosis.
Term Offered: Summer

PHYA 5400 Pathophysiology I
[4 credit hours]
This is the first semester of a three-semester course series. It will provide an overview of the pathologic processes that influence the development of diseases in humans. The course will include a discussion of normal function, pathophysiological processes in the development of diseases, and the impact of disease on patient health. Lectures will be delivered by the course instructor and may include in-class presentations, guest lecturers, and recorded instructional content, with built-in opportunities for questions and discussion.
Term Offered: Spring

PHYA 5410 Pathophysiology II
[4 credit hours]
This is the second module of this three-semester course series. It will provide an overview of the pathologic processes that influence the development of diseases in humans at the cellular, organ, and systemic levels. The course will include a discussion of normal function, pathophysiological processes in the development of diseases, and the impact of disease on patient health.
Term Offered: Summer

PHYA 5430 Pathophysiology III
[2 credit hours]
This is the third module of this three-semester course series. It will provide an overview of the pathologic processes that influence the development of diseases in humans at the cellular, organ, and systemic levels. The course will include a discussion of normal function, pathophysiological processes in the development of diseases, and the impact of disease on patient health.
Term Offered: Fall

PHYA 5510 Fundamentals of Pharmacology I
[4 credit hours]
A study of the general principles of pharmacotherapeutics and the rational use of drugs for the diagnosis, prevention and treatment of diseases.
Term Offered: Spring

PHYA 5520 Fundamentals of Pharmacology II
[3 credit hours]
A study of the general principles of pharmacotherapeutics and the rational use of drugs for the diagnosis, prevention and treatment of diseases.
Term Offered: Summer

PHYA 5530 Fundamentals of Pharmacology III
[1 credit hour]
A study of the general principles of pharmacotherapeutics and the rational use of drugs for the diagnosis, prevention and treatment of diseases. This course aims to introduce the physician assistant student to the use of drugs in the treatment of human diseases and to provide the student with a foundational knowledge base of drug properties and uses. The approach is to review the key features of the physiology and pathophysiology of a disease or "problem" that are amenable to drug modification. The pharmacology of individual drugs is then discussed with particular emphasis on the prototypes and most frequently prescribed drugs, followed by any newer drugs that have become available. Basic principles are emphasized so that the student will learn what questions they should ask about any new drug that becomes available. A second purpose is to introduce the student to the legal requirements for a PA to prescribe drugs in Ohio, the legal requirements of the drug prescription format, and ways by which prescribing errors can be minimized. Finally, the student will be introduced to the role of the FDA in regulating drug development and marketing. As a Physician Assistant, you will always learn about new drug treatments. Understanding the pharmacotherapeutic principles applied to currently available drugs is crucial because it will lead you to ask appropriate questions about new drug classes as they become available during your career as a lifelong learner and healthcare provider.
Term Offered: Fall

PHYA 6010 Clinical Genetics
[1 credit hour]
Clinical Genetics, a 1 credit hour course, is offered in the fall semester. The course describes the application of genetics to medical care and the application of these principles in the Primary Care Physician Assistant clinical practice. The discussions include: the basic structures and behavior of genes, the human genome, the role of genetics in medicine, genetic basics of human disease, application of genetics, and ethical considerations.
Term Offered: Fall

PHYA 6050 Ethics for PA Profession
[1 credit hour]
This course provides the foundation for ethics in the primary care clinical setting. Analyze common bioethical issues confronting physician assistants, and give the student the opportunity to share their experiences with peers.
Term Offered: Spring

PHYA 6110 Population and Lifestyle Medicine
[3 credit hours]
An introduction to basic concepts of health promotion and disease prevention, analysis of risk factors for disease, and an emphasis on strategies to modify lifestyles to promote health in the individual and community.
Term Offered: Summer

PHYA 6130 Evidence Based Medicine
[3 credit hours]
This course presents methods of research and their application to clinical research and practice. It emphasizes use of current research evidence in healthcare decision-making, an activity known as evidence-based practice. Topics include biostatistics, introduction to research methods, clinical analysis of the health-related information, and application of EBP to healthcare. Students develop a focused research question for their scholarly project and develop an introductory literature review on the topic. Scholarly project advisors will be identified.
Term Offered: Fall

PHYA 6150 Behavioral Science
[2 credit hours]
Study of concepts and practices related to evaluation and management of psychiatric diseases and conditions as well as behavioral issues which impact upon the health and well-being of patients.
Term Offered: Fall

PHYA 6310 Clinical Rotation - Psychiatric and Behavioral Health
[5 credit hours]
This supervised clinical practice experience (SCPE) is designed to support the achievement of program-defined learning outcomes in behavioral and mental health. This clinical rotation provides physician assistant students with immersive training in the evaluation and management of patients presenting with acute and chronic behavioral and mental health conditions. The patient population may include children, adolescents, adults, and elderly patients. Under the supervision of qualified licensed preceptors in behavioral and mental health settings, students engage in patient assessment and management, including obtaining focused medical and psychiatric histories, performing focused mental status examinations and relevant physical examinations, formulating and prioritizing differential diagnoses, selecting and interpreting diagnostic studies, and participating in evidence-based treatment plans. Emphasis is placed on patient safety, risk assessment, therapeutic communication, interprofessional collaboration, effective communication, and the development of clinical reasoning and professional behaviors in behavioral and mental health care environments.
Term Offered: Spring, Summer, Fall

PHYA 6320 Clinical Rotation - Elective
[5 credit hours]
This supervised clinical practice experience (SCPE) is an elective rotation designed to support the achievement of program-defined learning outcomes and to supplement the required supervised clinical practice experiences within the physician assistant program. The rotation provides physician assistant students with immersive clinical training in a medical or surgical elective setting, with patient care experiences appropriate to the clinical specialty and within the physician assistant scope of practice. The patient population may include individuals across the lifespan, including infants, children, adolescents, adults, and elderly patients, as available within the elective setting. Under the supervision of licensed preceptors, students participate in patient evaluation and management, including eliciting medical histories, performing physical examinations, formulating differential diagnoses, ordering and interpreting diagnostic studies, and developing evidence-based care plans appropriate to the elective clinical environment. Clinical settings vary by specialty and may include emergency department, inpatient, outpatient, or operating room environments. Emphasis is placed on developing competency in preventive care (as appropriate to the setting), acute and chronic disease management, patient education, and collaborative, patient-centered care within interprofessional healthcare teams. Students are evaluated on their progress toward program-defined learning outcomes.
Term Offered: Spring, Summer, Fall

PHYA 6330 Clinical Rotation - Emergency Medicine
[5 credit hours]
This supervised clinical practice experience (SCPE) is designed to support the achievement of program-defined learning outcomes in emergency medicine. This clinical rotation provides physician assistant students with immersive training in the evaluation and management of patients presenting with emergent and acute conditions. The patient population includes patients across the lifespan, infants, children, adolescents, adults, and elderly patients. Under the supervision of qualified licensed preceptors in the emergency department, students engage in rapid patient assessment and management, including obtaining focused histories, performing targeted physical examinations, formulating and prioritizing differential diagnoses, selecting and interpreting diagnostic studies, and participating in evidence-based treatment plans. Emphasis is placed on acute care, resuscitation principles, procedural skills, patient safety, interprofessional collaboration, effective communication, and the development of clinical reasoning and professional behaviors in fast-paced clinical environments.
Term Offered: Spring, Summer, Fall

PHYA 6340 Clinical Rotation - Family Medicine
[5 credit hours]
This supervised clinical practice experience (SCPE) is designed to support the achievement of program-defined learning outcomes in family medicine patient care. This clinical rotation provides physician assistant students with immersive training in the principles and practice of family medicine across the lifespan. The patient population includes patients across the lifespan, infants, children, adolescents, adults, and elderly patients. Under the supervision of licensed preceptors, students will engage in patient evaluation and management, including eliciting medical histories, performing physical examinations, formulating differential diagnoses, ordering and interpreting diagnostic studies, and developing evidence-based care plans in primarily outpatient family medicine settings. Emphasis is placed on building competency in preventive care, acute and chronic disease management, patient education, and interprofessional collaboration. Students are evaluated on their progress toward program-defined learning outcomes.
Term Offered: Spring, Summer, Fall

PHYA 6350 Clinical Rotation - Internal Medicine
[5 credit hours]
This supervised clinical practice experience (SCPE) is designed to support the achievement of program-defined learning outcomes in internal medicine patient care. This clinical rotation provides physician assistant students with immersive training in the evaluation and management of adult and elderly patients with acute and chronic medical conditions commonly encountered in internal medicine settings. Under the supervision of licensed preceptors, students engage in comprehensive patient assessment and management, including eliciting medical histories, performing physical examinations, formulating differential diagnoses, ordering and interpreting diagnostic studies, and developing evidence-based diagnostic and therapeutic care plans in inpatient and outpatient care. Emphasis is placed on the management of complex medical conditions, chronic disease management, preventive care, patient education, and interprofessional collaboration. Students are evaluated on their progress toward program-defined learning outcomes.
Term Offered: Spring, Summer, Fall

PHYA 6360 Clinical Rotation - Pediatrics
[5 credit hours]
This supervised clinical practice experience (SCPE) is designed to support the achievement of program-defined learning outcomes in pediatric patient care. This clinical rotation provides physician assistant students with immersive training structured in the principles and practice of pediatrics. The patient population includes neonates, infants, children, and adolescent patients across a range of developmental stages. Under the supervision of licensed preceptors, students will engage in pediatric patient evaluation and management, including obtaining age-appropriate medical histories, performing developmentally appropriate physical examinations, formulating differential diagnoses, ordering and interpreting diagnostic studies, and developing evidence-based care plans in outpatient pediatric settings. Emphasis is placed on preventive and well-child care, growth and developmental assessment, management of acute and chronic pediatric conditions, patient and family education, and interprofessional collaboration. Students are evaluated on their progress toward program-defined learning outcomes.
Term Offered: Spring, Summer, Fall

PHYA 6370 Clinical Rotation - Surgery
[5 credit hours]
This supervised clinical practice experience (SCPE) is designed to support the achievement of program-defined learning outcomes in surgical patient care. This clinical rotation provides physician assistant students with immersive training in the principles and practice of surgery. The patient population includes adult and elderly patients, and may include adolescent patients, presenting with conditions requiring surgical evaluation and management. Under the supervision of licensed preceptors, students will engage in preoperative, intraoperative, and postoperative patient evaluation and management, including obtaining medical histories, performing focused physical examinations, formulating differential diagnoses, ordering and interpreting diagnostic studies, and developing evidence-based surgical and perioperative care plans in inpatient and outpatient surgical settings. Emphasis is placed on building competency in surgical patient assessment, perioperative care, procedural skills appropriate to the physician assistant student role, patient education, and interprofessional collaboration. Students are evaluated on their progress toward program-defined learning outcomes.
Term Offered: Spring, Summer, Fall

PHYA 6380 Clinical Rotation - Gynecologic, Sexual, and Reproductive Health
[5 credit hours]
This supervised clinical practice experience (SCPE) is designed to support the achievement of program-defined learning outcomes in women's health care, including prenatal and gynecologic care. This clinical rotation is in the women's health medical specialty, providing physician assistant students with immersive training in the principles and practice of comprehensive gynecologic and reproductive medicine. The patient population includes adolescents, adults, and elderly patients presenting for routine, preventive, and problem-focused gynecologic and reproductive care in inpatient and outpatient settings. Under the supervision of qualified, licensed preceptors, students engage in patient evaluation and management, including obtaining focused gynecologic and sexual health histories, performing age-appropriate physical and pelvic examinations, formulating differential diagnoses, selecting and interpreting diagnostic studies, and contributing to evidence-based care plans in primarily outpatient clinical settings. Emphasis is placed on preventive care, contraception and family planning, management of gynecologic conditions, sexual health counseling, patient education, and interprofessional collaboration. Students are evaluated on their progress toward program-defined learning outcomes.
Term Offered: Spring, Summer, Fall

PHYA 6500 Introduction to Clinical Practice
[4 credit hours]
This course prepares physician assistant students for the clinical phase of the program by reinforcing and integrating didactic knowledge with hands-on clinical skills, including history taking, physical examination, clinical documentation, and oral patient presentation. Emphasis is placed on clinical reasoning, professional behaviors, patient safety, and readiness for supervised clinical practice experiences through active, team-based learning and faculty mentorship. Students refine foundational competencies in patient interviewing, physical examination techniques, clinical documentation, and presentation of patient cases. The course incorporates review of clinical medicine, expectations outlined in the clinical manual, and essential professional, legal, and safety requirements, including mandatory training in bloodborne pathogens and clinical site preparedness. Instructional methods emphasize critical thinking, clinical problem-solving, and collaborative learning, supporting students' transition from didactic instruction to clinical application.
Term Offered: Spring

PHYA 6610 Scholarly Project I
[1 credit hour]
This first course in the three-part Scholarly Project series guides Physician Assistant (PA) students through the continued development of a graduate-level research paper with the goal of producing work suitable for submission to a peer-reviewed journal. Emphasis is placed on synthesizing research findings into a comprehensive literature review and preparing a professional poster presentation that meets the PA program's and graduate education's academic standards. This course builds on the work completed in Evidence-Based Medicine, PHYA 6130, and is part of the program's summative evaluation process. In Scholarly Project I, learners will create an initial outline, develop a research proposal, conduct a literature review, and complete the introduction and methods section with guidance from faculty.
Term Offered: Spring, Summer, Fall

PHYA 6620 Scholarly Project II
[1 credit hour]
This second course in the three-part Scholarly Project series guides Physician Assistant (PA) students through the continued development of a graduate-level research paper with the goal of producing work suitable for submission to a peer-reviewed journal. Emphasis is placed on synthesizing research findings into a comprehensive literature review and preparing a professional poster presentation that meets the PA program's and graduate education's academic standards. This course builds on the work completed in Scholarly Project I, PHYA 6610, and is part of the program's summative evaluation process. In Scholarly Project II, the learner will complete the results section, also called the literature review section, with guidance from faculty.
Term Offered: Spring, Summer, Fall

PHYA 6630 Scholarly Project III
[1 credit hour]
This third course in the three-part Scholarly Project series guides Physician Assistant (PA) students through the continued development of a graduate-level research paper with the goal of producing work suitable for submission to a peer-reviewed journal. Emphasis is placed on synthesizing research findings into a comprehensive literature review and preparing a professional poster presentation that meets the PA program's and graduate education's academic standards. This course builds on the work completed in Scholarly Project II, PHYA 6620, and is part of the program's summative evaluation process. In Scholarly Project III, the discussion, abstract, manuscript, and poster are completed and serve as the foundation for the project presentation with guidance from faculty.
Term Offered: Spring, Summer, Fall

Physics (PHYS)

PHYS 5210 Theoretical Mechanics
[3 credit hours]
Kinematics and dynamics of particles and rigid bodies. Lagrangian and Hamiltonian equations of motion.
Term Offered: Fall

PHYS 5230 Classical Electricity And Magnetism I
[3 credit hours]
Electrostatics: the equations of Laplace and Poisson-Maxwell's equations and their solutions.
Term Offered: Fall

PHYS 5240 Electricity And Magnetism II
[3 credit hours]
Maxwell's equations and their solutions; electromagnetic radiation.
Prerequisites: PHYS 5230 with a minimum grade of D-
Term Offered: Spring

PHYS 5310 Quantum Mechanics
[3 credit hours]
Formalism and applications of quantum mechanics: Hilbert space, time independent and time-dependent perturbation theories, atomic and molecular structure and spectra, and scattering theory.
Term Offered: Spring

PHYS 5810 Astrophysics I
[3 credit hours]
Spherical coordinate systems, astronomical time, celestial mechanics, the solar system and planetary physics, photometry, radiative transfer, stellar spectra and classification, binary stars and stellar masses.
Term Offered: Fall

PHYS 5820 Astrophysics II
[3 credit hours]
Stellar structure and evolution, close binaries, origin of the elements, the sun, variable stars, star clusters, the interstellar medium, the Milky Way Galaxy, stellar statistics, galaxy structure and evolution, cosmology.
Prerequisites: PHYS 5810 with a minimum grade of D-
Term Offered: Spring

PHYS 5900 Research Techniques In Physics And Astronomy
[1-6 credit hours]
Research work under the guidance of a member of the graduate faculty. Designed to prepare the student to propose and carry out the thesis research required for the M.S. degree.
Term Offered: Summer

PHYS 6010 Physics And Astronomy Colloquium
[0-2 credit hours]
Topical lectures by visiting and local professionals.
Term Offered: Spring, Fall

PHYS 6020 Physics And Astronomy Journal Seminar
[0-1 credit hours]
Literature review seminar.
Term Offered: Spring, Fall

PHYS 6040 Physics and Astronomy Professional Development Seminar
[1 credit hour]
This seminar is intended to help graduate students assess future career options and develop skills that will enhance their productivity and marketability for those careers. The class will involve strong faculty-student and peer student interaction with the goal of getting students to actively consider potential career paths and to start mapping out the steps necessary to achieve them. There will be periodic small homework assignments and grades will be assigned as pass/fail.
Term Offered: Fall

PHYS 6120 Statistical Analysis for Physicists
[3 credit hours]
Probability, random variables, special random variables, functions of random variables, random numbers, error propagation, Monte Carlo simulations, frequentist parameter estimation, frequentist hypothesis testing, Bayesian parameter estimation, Bayesian model selection, signal-to-noise estimation
Term Offered: Fall

PHYS 6140 Fundamentals Of Modern Physics
[3 credit hours]
An intensive course which reviews the fundamentals of atomic, statistical and condensed matter physics. Provides a common foundation for entering graduate students for succeeding courses in physics and astronomy.
Term Offered: Fall

PHYS 6180 Advanced Atomic And Nuclear Physics Laboratory
[2-3 credit hours]
Experiments in nuclear, atomic, and condensed matter physics, such as gamma-ray and X-ray spectroscopies, beta and alpha particle spectroscopics, NMR, ESR, Mossbauer effect, neutron shielding, detectors and electronics, and atomic emission spectroscopy. One four-hour lab and one hour lecture per week.
Prerequisites: PHYS 6140 with a minimum grade of D-
Term Offered: Spring

PHYS 6220 Classical Mechanics
[3 credit hours]
Advanced classical mechanics, including the variational principles, Lagrange and Hamilton mechanics, and linear and nonlinear systems.
Term Offered: Fall

PHYS 6250 Classical Electrodynamics I
[3 credit hours]
Solutions to Poisson's equation in Cartesian, spherical and cylindrical coordinates with Dirichlet, Neuman and mixed boundary conditions. Maxwell's equations and their solutions applied to waveguides and nonlinear materials.
Term Offered: Spring

PHYS 6260 Classical Electrodynamics II
[3 credit hours]
Solutions to the wave equation with time dependent source terms, energy loss from high energy charged particles in dense materials, special relativity, classical field theory, invariant Lagrangians and conserved quantities.
Prerequisites: PHYS 6250 with a minimum grade of D-
Term Offered: Fall

PHYS 6280 Photovoltaic Materials And Device Physics Laboratory
[3 credit hours]
Fabrication and characterization of solar cell materials and devices, addressing materials science and physics of substrate preparation, absorber and window deposition processes, metal contact formation, and measurement of physical properties. One four-hour lab and one-hour lecture per week.
Prerequisites: PHYS 6140 with a minimum grade of D- and PHYS 7140 with a minimum grade of D-
Term Offered: Fall

PHYS 6320 Quantum Mechanics I
[3 credit hours]
Quantum theory and its application to physical problems. Topics include dynamics in the Schrodinger and Heisenberg pictures, invariance principles and angular momentum theory, perturbation theory, the variational method.
Term Offered: Fall

PHYS 6330 Quantum Mechanics II
[3 credit hours]
The quantum theory of scattering, electromagnetic interactions, quantization of the electromagnetic field and introduction to the Dirac equation.
Term Offered: Spring

PHYS 6450 Statistical Mechanics
[3 credit hours]
A fundamental quantum-mechanical development of statistical thermodynamics. Non-interacting and weakly interacting many-particle systems in the classical and quantum regimes, with applications to various fields of physics.
Term Offered: Spring

PHYS 6540 Structure, Defects And Diffusion
[4 credit hours]
A generic materials science approach to the study of crystalline structure, defects (point, line and planar) in crystalline materials, and the mechanisms and kinetics of diffusion in the condensed state.
Term Offered: Fall

PHYS 6550 Thermodynamics And Phase Transformations In Condensed Systems
[4 credit hours]
A materials science approach to the thermodynamics of condensed state equilibria and phase transformation kinetics.
Prerequisites: PHYS 6450 with a minimum grade of D-
Term Offered: Spring

PHYS 6630 Semiconductors I
[3 credit hours]
Review of modern theory of solids. Semiconducting and metallic materials. Semiconductor devices including p-n junctions and solar cells.
Prerequisites: PHYS 4510 with a minimum grade of D- and EECS 4400 with a minimum grade of D-
Term Offered: Spring

PHYS 6640 Fundamentals of Solar Cells
[3 credit hours]
Worldwide status of Photovoltaics, Semiconductors. P-n junction diodes. Ideal solar cells. Efficiency losses. Single crystals and thin films technologies. PV systems.
Prerequisites: PHYS 4510 with a minimum grade of D- and EECS 4400 with a minimum grade of D-
Term Offered: Spring

PHYS 6660 Foundations of Glass Science
[3 credit hours]
This course introduces the scientific foundations of glass. Topics include glass formation, structure, phase transformations, vibrational and thermal properties, atomic and ionic transport, viscosity and glass transition, electronic and optical properties, surface and chemical durability, and mechanical properties. Emphasis is placed on linking atomic-scale structure and bonding to macroscopic behavior across different families of glasses. The course provides a conceptual foundation for students pursuing glass science, materials science, and related research or industries.
Term Offered: Fall

PHYS 6670 Glass Technologies
[3 credit hours]
A foundational course on glass technologies with emphasis on industrial practices. Topics include both conventional and non-conventional glass making, forming, and processing technologies across a broad range of glass families and product forms. Emphasis is also placed on how glass technologies are developed to align with composition and to engineer structure, thereby achieving tailored properties and functionalities in glass products. Historical and current glass industry players, manufacturing technologies, and products that have shaped the modern world are also highlighted throughout the course.
Term Offered: Spring

PHYS 6810 Stellar Astrophysics I
[3 credit hours]
Stellar atmospheres and their emergent spectra. Physics of radiation, matter and their interaction. Radiative transfer, hydrostatic and radiative equilibrium, convection, line formation and spectral signatures of atmospheric physics.
Term Offered: Fall

PHYS 6820 Stellar Astrophysics II
[3 credit hours]
Stellar structure and evolution. Equation of state, nuclear reactions and nucleosynthesis, stellar formation, evolution and death, enrichment of the interstellar medium, formation of planetary systems, solar physics and helioseismology.
Term Offered: Spring

PHYS 6830 Galactic Astronomy I
[3 credit hours]
Stellar spectra, colors, compositions and ages; star clusters; pulsating stars; calibration of distance indicators. Interstellar dust, interstellar extinction, interstellar gas, nebulae; structure of the interstellar medium.
Term Offered: Fall

PHYS 6840 Galactic Astronomy II
[3 credit hours]
Structure and dynamics of the Galaxy, shocks and explosions, stellar kinematics, galactic rotation, and dynamical and chemical evolution.
Term Offered: Spring

PHYS 6940 Industrial Internship
[1-6 credit hours]
Experiential learning in an academic advisor-approved business, industry, or non-profit. Six credits are required for the PSM degree.
Term Offered: Spring, Summer, Fall

PHYS 6960 M.s. Thesis Research
[1-15 credit hours]
Thesis research required for the M.S. degree.
Term Offered: Spring, Summer, Fall

PHYS 6980 Special Topics
[1-4 credit hours]
Course reserved for visiting lecturers and topics not covered otherwise.
Term Offered: Spring, Summer, Fall

PHYS 6990 Independent Study
[1-4 credit hours]

PHYS 7140 Fundamentals Of Modern Physics
[3 credit hours]
An intensive course which reviews the fundamentals of atomic, statistical and condensed matter physics. Provides a common foundation for entering graduate students for succeeding courses in physics and astronomy.
Term Offered: Fall

PHYS 7180 Advanced Atomic and Nuclear Physics Laboratory
[2-3 credit hours]
Experiments in nuclear, atomic, and condensed matter physics, such as gamma-ray and X-ray spectroscopies, betas and alpha parrticle spectroscopies, NMR, ESR, Mossbauer effect, neutron shielding, detectors and electronics, and atomic emission spectroscopy. One four-hour lab and one hour lecture per week.
Prerequisites: PHYS 6140 with a minimum grade of D- or PHYS 7140 with a minimum grade of D-
Term Offered: Spring

PHYS 7220 Classical Mechanics
[3 credit hours]
Advanced classical mechanics, including the variational principles, Lagrange and Hamilton mechanics, and linear and nonlinear systems.
Term Offered: Fall

PHYS 7250 Classical Electrodynamics I
[3 credit hours]
Solutions to Poisson's equation in Cartesian, spherical and cylindrical coordinates with Dirichlet, Neuman and mixed boundary conditions. Maxwell's equations and their solutions applied to waveguides and nonlinear materials.
Term Offered: Spring

PHYS 7260 Classical Electrodynamics II
[3 credit hours]
Solutions to the wave equation with time dependent source terms, energy loss from high energy charged particles in dense materials, special relativity, classical field theory, invariant Lagrangians and conserved quantities.
Prerequisites: PHYS 6250 with a minimum grade of D- or PHYS 7250 with a minimum grade of D-
Term Offered: Fall

PHYS 7280 Photovoltaic Materials And Device Physics Laboratory
[3 credit hours]
Detailed fabrication and characterization of solar cell materials and devices, addressing materials science and physics of substrate preparation, absorber and window deposition processes, metal contact formation, and measurement of physical properties. One four-hour lab and one-hour lecture per week.
Prerequisites: PHYS 6140 with a minimum grade of D- and PHYS 7140 with a minimum grade of D-
Term Offered: Fall

PHYS 7320 Quantum Mechanics I
[3 credit hours]
Quantum theory and its application to physical problems. Topics include dynamics in the Schrodinger and Heisenberg pictures, invariance principles and angular momentum theory, perturbation theory, the variational method.
Term Offered: Fall

PHYS 7330 Quantum Mechanics II
[3 credit hours]
The quantum theory of scattering, electromagnetic interactions, quantization of the electromagnetic field and introduction to the Dirac equation.
Term Offered: Spring

PHYS 7450 Statistical Mechanics
[3 credit hours]
A fundamental quantum-mechanical development of statistical thermodynamics. Non-interacting and weakly interacting many-particle systems in the classical and quantum regimes, with applications to various fields of physics.
Term Offered: Spring

PHYS 7810 Stellar Astrophysics I
[3 credit hours]
Stellar atmospheres and their emergent spectra. Physics of radiation, matter and their interaction. Radiative transfer, hydrostatic and radiative equilibrium, convection, line formation, and spectral signatures of atmospheric physics.
Term Offered: Fall

PHYS 7820 Stellar Astrophysics II
[3 credit hours]
Stellar structure and evolution. Equation of state, nuclear reactions and nucleosynthesis, stellar formation, evolution and death, enrichment of the interstellar medium, formation of planetary systems, solar physics and helioseismology.
Term Offered: Spring

PHYS 7830 Galactic Astronomy I
[3 credit hours]
Stellar spectra, colors, compositions, and ages; star clusters; pulsating stars; calibration of distance indicators. Interstellar dust, interstellar extinction, interstellar gas, nebulae; structure of the interstellar medium.
Term Offered: Fall

PHYS 7840 Galactic Astronomy II
[3 credit hours]
Structure and dynamics of the Galaxy, shocks and explosions, stellar kinematics, galactic rotation, and dynamical and chemical evolution.

PHYS 7910 Advanced Research In Physics And Astronomy
[1-15 credit hours]
Research work under the guidance of a member of the graduate faculty. Designed to prepare the student to propose and carry out the thesis research required for the Ph.D. degree.
Term Offered: Spring, Summer, Fall

PHYS 8010 Physics And Astronomy Colloquium
[0-2 credit hours]
Topical lectures by visiting and local professionals.
Term Offered: Spring, Fall

PHYS 8020 Physics And Astronomy Journal Seminar
[0-1 credit hours]
Literature review seminar.
Term Offered: Spring, Fall

PHYS 8040 Physics and Astronomy Professional Development Seminar
[1 credit hour]
This seminar is intended to help graduate students assess future career options and develop skills that will enhance their productivity and marketability for those careers. The class will involve strong faculty-student and peer student interaction with the goal of getting students to actively consider potential career paths and to start mapping out the steps necessary to achieve them. There will be periodic small homework assignments and grades will be assigned as pass/fail.
Term Offered: Fall

PHYS 8540 Structure, Defects And Diffusion
[4 credit hours]
A generic materials science approach to the study of crystalline structure, defects (point, line and planar) in crystalline materials, and the mechanisms and kinetics of diffusion in the condensed state.
Term Offered: Fall

PHYS 8550 Thermodynamics And Phase Transformations In Condensed Systems
[4 credit hours]
A materials science approach to the thermodynamics of condensed state equilibria and phase transformation kinetics.
Prerequisites: PHYS 6540 with a minimum grade of D- or PHYS 8540 with a minimum grade of D-
Term Offered: Spring

PHYS 8590 Current Issues In Condensed Matter And Material Science
[3 credit hours]
A survey of various areas in the physics of condensed matter and materials. Content will vary with instructor and from year to year.

PHYS 8630 Semiconductors I
[3 credit hours]
Review of modern theory of solids. Semiconducting and metallic materials. Semiconductor devices including p-n junctions and solar cells.
Prerequisites: PHYS 4510 with a minimum grade of D- and EECS 4400 with a minimum grade of D-
Term Offered: Spring

PHYS 8640 Fundamentals of Solar Cells
[3 credit hours]
Worldwide status of Photovoltaics, Semiconductors. P-n junction diodes. Ideal solar cells. Efficiency losses. Single crystals and thin films technologies. PV systems.
Prerequisites: PHYS 4510 with a minimum grade of D- and EECS 4400 with a minimum grade of D-
Term Offered: Spring

PHYS 8860 General Relativity
[3 credit hours]
Differential geometry, exterior calculus of tensors, the stress-energy tensor and Einstein field equation, stellar evolution and black holes, gravitational lensing, tests of the theory, and gravitational wave detection.
Prerequisites: PHYS 7260 with a minimum grade of D-
Term Offered: Spring, Fall

PHYS 8870 Cosmology
[3 credit hours]
Cosmological solutions for Einstein's field equation, the standard cosmological model, particle physics, nucleosynthesis and the cosmic background radiation. Inflation, dark matter and mass distribution, gravitational evolution, and formation of galaxies.
Prerequisites: PHYS 8860 with a minimum grade of D-
Term Offered: Fall

PHYS 8960 Ph. D. Thesis Research
[1-15 credit hours]
Thesis research required for the Ph.D. degree.
Term Offered: Spring, Summer, Fall

PHYS 8980 Special Topics
[1-4 credit hours]
Course reserved for visiting lecturers and topics not covered otherwise.
Term Offered: Spring, Summer, Fall

PHYS 8990 Independent Study
[1-4 credit hours]

Physiology (PHSL)

PHSL 5050 Human Physiology
[4 credit hours]
This course addresses cellular, regulatory and organ system physiology including blood and immune system, cardiovascular, respiratory, gastrointestinal, renal reproductive and endocrine physiology
Term Offered: Fall

Political Science (PSC)

PSC 5220 Advocacy Groups in US Politics
[3 credit hours]
This course investigates the role of advocacy groups in American politics. It develops practical lobbying skills through experiential learning and covers topics such as the role of advocacy groups in campaigns and elections, grass roots mobilization, and agenda setting.
Term Offered: Spring, Fall

PSC 5230 Presidency
[3 credit hours]
The nomination, election, responsibilities and performance of the American president. The course includes decision making, policy making, personality, and relations with Congress, the Courts, news media and interest groups.
Term Offered: Spring

PSC 5280 Legislative Process
[3 credit hours]
An intensive study of the development, functions, committees, party and factional organizations of the U.S. Congress, state legislatures and non-American legislative bodies.
Term Offered: Summer, Fall

PSC 5300 Principles of Public Administration
[3 credit hours]
This course provides an overview of public administration. It addresses organization theory, decision making, budgeting, public policy, and the changing role of public institutions. It covers important democratic, professional, ethical and human values that are central to public administration.

PSC 5320 Urban Policy & Administration
[3 credit hours]
What does it take to govern a city and its environs? In this course, we examine the balance between the pressing needs of a city and the many economic and political constraints that citizens, leaders, and experts must navigate to achieve their goals.
Term Offered: Spring, Summer, Fall

PSC 5340 Environmental Policy And Administration
[3 credit hours]
Policy for air and water pollution control, hazardous wastes, nuclear wastes. Examination of EPA, Congressional committees, state and city agencies as well as some international issues.
Term Offered: Fall

PSC 5360 Ethics In Public Policy And Administration
[3 credit hours]
Examination of values and principles which guide public policy formation and public administration. Applications of philosophical concepts to policy problems and the responsibilities of public administrators will be emphasized.
Term Offered: Spring, Summer, Fall

PSC 5380 Fundraising
[3 credit hours]
This course examines the theoretical, practical and ethical issues related to public and nonprofit organizations fundraising. This course will prepare students who plan to work in public and nonprofit organizations to win and manage grants as well as philanthropic donations from multiple sources.
Term Offered: Spring, Summer, Fall

PSC 5410 Public and Nonprofit Management
[3 credit hours]
This course examines management techniques, organizational design, strategic planning and the theoretical and practical behavioral skills that are necessary for effective public and nonprofit management. These skills include communication, organizational, and leadership skills within public and nonprofit organizations.
Term Offered: Spring, Summer, Fall

PSC 5420 Political Determinants of Health
[3 credit hours]
An examination of the political determinants of health, that is, the upstream political forces and policy decisions that are the causal sources of the social conditions that lead to health inequities. This course introduces the importance of power, politics, advocacy, and policy in public health. Students will learn models of health equity and the political determinants of health and apply these to contemporary case studies with particular attention to the health effects of racism.
Term Offered: Spring, Fall
Multicultural US Diversity

PSC 5430 Human Resources Management in Public and Nonprofit Organizations
[3 credit hours]
This course is a study of human resource management in public and nonprofit organizations. The course explores broad themes within public personnel administration such as recruitment, retention, motivation, and diversity to provide students with the opportunity to develop technical skills necessary for effectively managing human resources in contemporary public agencies, including government and nonprofit organizations.
Term Offered: Spring, Summer, Fall

PSC 5440 Budgeting And Financial Administration
[3 credit hours]
An examination of the institutions and techniques of financial administration, including government accounting, budgeting, financial management and government choice.
Term Offered: Spring, Summer, Fall

PSC 5480 Introduction to Nonprofits
[3 credit hours]
This course provides an overview of the voluntary sector with an emphasis on the historical, philosophical, and theoretical justifications of the nonprofit sector, voluntary action, and philanthropy. The course will explore the administration and management of nonprofit organizations as well as the impact nonprofit organizations have on public policy.
Term Offered: Spring, Summer, Fall

PSC 5560 Law And Public Administration
[3 credit hours]
Survey of law topics that are relevant for managers of public and nonprofit organizations.
Term Offered: Spring, Summer, Fall

PSC 5590 Law, Policy And The Politics of Sexuality
[3 credit hours]
This course explores the public policies that affect the lesbian, gay, bisexual and transgender communities in the United States and in other countries. It examines the factors that affect policymaking in this area.
Term Offered: Spring, Fall

PSC 5720 International Organizations
[3 credit hours]
A study of the background, aims, purposes and problems of international organizations. An examination of the functions of the specialized agencies and other organizations of the United Nations system.
Term Offered: Fall

PSC 5950 Mpa Research Report
[2 credit hours]
Independent research, under the direction of a faculty adviser, analyzing experience as a public official.
Term Offered: Spring, Summer, Fall

PSC 5980 Current Topics In Political Science
[3 credit hours]
Examination of emerging issues within the various segments and subfields of the discipline of political science.
Term Offered: Spring, Fall

PSC 5990 Independent Study In Political Science
[1-3 credit hours]
Individual study in selected topic.
Term Offered: Spring, Summer, Fall

PSC 6110 Public Policy Methods and Analysis
[3 credit hours]
This course explores research methodology as used in public affairs and public administration. We will analyze political phenomena in a rigorous and scientific manner and connect research methods to practice of administration. Topics include research design, research ethics, quantitative and qualitative methodological approaches, basic statistical techniques for data analysis through measures of association and regression. By doing so, this course assists in the professional development of in-service and pre-service practitioners of public management.
Term Offered: Spring, Summer, Fall

PSC 6420 Program Evaluation
[3 credit hours]
Evaluating the effectiveness of programs and policies is an essential component of public, nonprofit and private sector management. This class is an introduction to the field of program evaluation. Evaluation uses research methodology to investigate the formation, implementation and administration of public policies and public programs.
Term Offered: Spring, Summer, Fall

PSC 6430 Public Policy Process
[3 credit hours]
Application of current theories of the public policy process to current issues in public policy and management. Emphasis on the dominant theories of the process, including policy streams, advocacy coalitions, punctuated equilibrium, institutional and rational choice models.
Term Offered: Spring, Summer, Fall

PSC 6490 Public Administration Capstone
[3 credit hours]
This course concludes the MPA curriculum at the University of Toledo. It is designed to integrate theoretical and practical knowledge to help students further their public and non-profit sector careers.
Term Offered: Spring, Summer, Fall

PSC 6940 Professional Experience
[1 credit hour]
Professional experience, such as an internship or professional project, in public or nonprofit agency and preparation for the MPA Capstone course.
Term Offered: Spring, Summer, Fall

PSC 6960 Thesis Seminar
[1-6 credit hours]
Supervision of master's thesis writing.
Term Offered: Spring, Summer, Fall

Psychology (PSY)

PSY 5000 History Of Psychology
[3 credit hours]
An historical treatment of the development of modern psychology, starting in the mid 19th century, with some consideration of earlier approaches. Theoretical developments are emphasized.
Prerequisites: PSY 1010 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

PSY 6030 Research Practicum
[1-9 credit hours]
Developing, conducting, analyzing and preparing reports of research projects under faculty supervision. May be repeated.
Term Offered: Spring, Summer, Fall

PSY 6040 Teaching Practicum
[3 credit hours]
Supervised experience in the teaching of psychology. May be repeated for credit.
Term Offered: Spring, Fall

PSY 6050 Culture And Psychology
[3 credit hours]
A theoretical and empirical analysis of the systematic functioning of culture in psychological phenomena, with a focus on key concepts in clinical, cognitive, developmental and social psychology.
Term Offered: Spring

PSY 6070 The Science of Emotion
[3 credit hours]
An integrative course focusing on emotion in the context of affective and biological aspects of behavior.
Term Offered: Spring, Summer, Fall

PSY 6080 Grant Writing in Psychology
[3 credit hours]
Provides an overview of the federal grant writing process in Psychology.
Term Offered: Spring, Summer, Fall

PSY 6100 Quantitative Methods In Psychology I
[3 credit hours]
Probability theory, descriptive and inferential statistics, hypothesis testing, correlation.
Term Offered: Spring, Fall

PSY 6110 Quantitative Methods In Psychology II
[3 credit hours]
Analysis of variance, regression analyses, non-parametric analyses.
Term Offered: Spring, Fall

PSY 6130 Design And Evaluation Of Psychological Research
[3 credit hours]
Readings and discussion of problems of research design and analysis.
Term Offered: Fall

PSY 6160 Advanced Research Seminar in Psychology
[3 credit hours]
Advanced research seminar focusing on selected topics from the general science of psychology.
Prerequisites: PSY 6130 with a minimum grade of B- and PSY 7130 with a minimum grade of B-
Term Offered: Spring, Summer, Fall

PSY 6200 Systems Of Personality
[3 credit hours]
Advanced historical overview of the main systems for understanding human beings: sources of motivation, coping, dysfunction, strengths/virtues. Emphasizes philosophical understandings of personality systems, analysis of major contributions and multi-perspective critiques.
Term Offered: Spring, Fall

PSY 6210 Psychopathology
[3 credit hours]
Critical analysis of diagnostic classification models, etiological conceptualizations and therapeutic interventions form mental disorders.
Term Offered: Fall

PSY 6220 Cognitive Assessment
[4 credit hours]
Assessment of cognitive functioning, utilizing tests of cognitive abilities and achievement.
Term Offered: Spring, Fall

PSY 6230 Personality Assessment
[4 credit hours]
Assessment of personality functioning utilizing objective tests.
Prerequisites: PSY 6220 with a minimum grade of D-
Term Offered: Spring

PSY 6240 Assessment I
[4 credit hours]
This course is designed to provide clinical psychology doctoral students with the training to attain the profession-wide competency in assessment, as required by the APA Commission on Accreditation. Students will learn foundational skills in psychometrics and integrative multimethod assessment in the process of learning to administer, score, interpret, and communicate about the most commonly used standardized measures for behavioral and cognitive assessment in order to be prepared to engage in evidence-based assessment practice.
Corequisites: PSY 6290, PSY 6360
Term Offered: Spring, Fall

PSY 6250 Seminar In Clinical Psychology
[3 credit hours]
Advanced seminar focusing on selected topics from the general area of clinical psychology. -001 Clinical neuropsychology -002 Child psychopathology -003 Child Clinical Intervention -004 Marital & Family Therapy -005 Psychotherapy research & program evaluation.
Term Offered: Spring, Summer, Fall

PSY 6260 Professional And Ethical Issues
[3 credit hours]
Exploration of ethical and professional issues faced by clinical psychologists. Detailed analysis of the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct.
Term Offered: Spring, Fall

PSY 6280 Assessment II
[4 credit hours]
This course is designed to provide clinical psychology doctoral students with the training to attain the profession-wide competency in assessment, as required by the APA Commission on Accreditation. Students will learn foundational skills in psychometrics and integrative multimethod assessment in the process of learning to administer, score, interpret, and communicate about the most commonly used standardized measures for neuropsychological and personality and psychopathology assessment in order to be prepared to engage in evidence-based assessment practice.
Prerequisites: PSY 6240 with a minimum grade of D-
Corequisites: PSY 6300, PSY 6370
Term Offered: Spring

PSY 6290 Foundations of Clinical Practice I
[3 credit hours]
The goal of this course is to provide an introduction to the basic clinical skills needed to conduct intake assessments and provide therapy. Foundational clinical skills central to all forms of assessment and therapy will be reviewed and practiced, and basic tenets of professionalism and ethics relevant to clinical psychology will be discussed. Application of skills to diverse populations and cultural competence considerations for assessment and therapy will also be discussed.
Corequisites: PSY 6240, PSY 6360
Term Offered: Fall

PSY 6300 Foundations of Clinical Practice II
[3 credit hours]
The goal of this course is to provide a continued introduction, building upon the content of PSY 6300 Foundations of Clinical Practice I, to the basic clinical skills needed to conduct intake and diagnostic assessments, administer structured diagnostic interviews, and provide therapy. Foundational clinical skills central to all forms of assessment and therapy will be reviewed and practiced, including assessment and treatment techniques relevant to vulnerable and at-risk groups.
Prerequisites: PSY 6290 with a minimum grade of D-
Corequisites: PSY 6280, PSY 6370
Term Offered: Spring

PSY 6330 Psychodynamic Psychotherapy
[3 credit hours]
Didactic course covering psychoanalytic/psychodynamic theories, case conceptualization, theorapy techniques, and relevant empirical research.
Term Offered: Spring, Fall

PSY 6340 Cognitive-Behavioral Psychotherapy
[3 credit hours]
Presentation and exploration of the theory and techniques of cognitive-behavioral assessment and therapy. Emphasis on understanding the theoretical and empirical base for cognitive-behavioral interventions and implications for application in clinical and clinical-research settings.
Term Offered: Spring

PSY 6360 Foundations of Psychotherapy I
[3 credit hours]
This course is designed to provide a basis for the attainment of the profession-wide competency of intervention, with a specific focus on preparing students to develop competence in evidence-based interventions consistent with the scope of Health Service Psychology. This course will present an overview of psychopathology and various classification models of the major disorder areas, as well as provide an introduction to the major theories of psychology and the principles underlying behavioral and cognitive therapy.
Corequisites: PSY 6240, PSY 6290
Term Offered: Spring, Fall

PSY 6370 Foundations of Psychotherapy II
[3 credit hours]
This course is designed to provide a basis for the attainment of the profession-wide competency of intervention, with a specific focus on preparing students to develop competence in evidence-based interventions consistent with the scope of Health Service Psychology. This course will present an overview of and foundational knowledge relevant to four key areas of psychological intervention: (1) Cognitive Behavioral Therapy, (2) Family and Couple Therapy, (3) Psychodynamic Psychotherapy, and (4) Child and Adolescent Therapy.
Prerequisites: PSY 6360 with a minimum grade of D-
Corequisites: PSY 6280, PSY 6300
Term Offered: Spring

PSY 6380 Empirically Supported Interventions and Processes of Change
[3 credit hours]
This course is designed to provide advanced knowledge in empirically-supported interventions in clinical psychology. Specifically, this course will provide in-depth instruction in the use of psychological interventions for treatment numerous psychological conditions. All interventions or approaches taught in this course have been well researched with substantial data existing to support their effectiveness.
Prerequisites: PSY 6240 with a minimum grade of D- and PSY 6280 with a minimum grade of D- and PSY 6290 with a minimum grade of D- and PSY 6300 with a minimum grade of D- and PSY 6360 with a minimum grade of D- and PSY 6370 with a minimum grade of D-
Term Offered: Spring, Fall

PSY 6390 Clinical Laboratory
[3 credit hours]
Clinical interviewing, diagnostic assessment, case conceptualization and oral presentation of clinical cases. Diagnostic, therapeutic and professional issues are addressed via didactic coursework and practicum work with clients in the Psychology Clinic.
Term Offered: Spring

PSY 6400 Cognitive Psychology
[3 credit hours]
An intensive examination of human information processing. Topics include neural bases of cognition, perceptual and attentional processing, mental imagery, memory, problem solving and reasoning.
Term Offered: Spring, Summer, Fall

PSY 6410 Seminar In Cognitive Psychology
[3 credit hours]
An advanced seminar focusing on selected topics from the general area of Cognitive Psychology.
Term Offered: Spring, Fall

PSY 6500 Developmental Psychology
[3 credit hours]
Advanced treatment of the theoretical and empirical literature in developmental psychology, and of the major issues of the field.
Term Offered: Spring, Fall

PSY 6510 Seminar In Developmental Psychology
[3 credit hours]
Readings and evaluative discussions of the primary research literature in developmental psychology.
Prerequisites: PSY 6500 with a minimum grade of D-
Term Offered: Spring, Fall

PSY 6600 Behavioral Neuroscience
[3 credit hours]
Structure and function of neurons and the neural mediation of behavior, both normal and abnormal.
Term Offered: Summer

PSY 6700 Social Psychology
[3 credit hours]
Social cognition and behavior, interpersonal influence and social relations will be addressed.
Term Offered: Spring, Fall

PSY 6710 Seminar In Social Psychology
[3 credit hours]
In-depth treatment of selected topics in Social Psychology.
Term Offered: Spring, Fall

PSY 6720 Social Cognition
[3 credit hours]
This course examines how people make sense of other people, themselves, and social situations by examining the cognitive structures and processes involved in judgments, decisions, perceptions, beliefs, and behavior. The topics include (but are not limited to) attribution, counterfactual thinking, judgment heuristics, schemas, person perception, attitudes, and stereotypes/prejudice.
Term Offered: Spring, Fall

PSY 6810 Clinical Practicum I
[0-3 credit hours]
This first-year practicum course includes observation of and entry-level participation in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Term Offered: Spring, Fall

PSY 6820 Clinical Practicum II
[3 credit hours]
This second-year practicum course includes participation, as a beginning student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PSY 6830 Clinical Practicum III
[1-3 credit hours]
This third-year practicum course includes participation, as an experienced student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of C and PSY 6820 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PSY 6840 Clinical Practicum IV
[1-3 credit hours]
This fourth-year practicum course includes participation, as a senior-level student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of D- and PSY 6820 with a minimum grade of D- and PSY 6830 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

PSY 6850 Family And Couple Practicum
[3 credit hours]
Supervision of psychotherapy with families and couples seen through The University of Toledo Psychology Clinic.
Term Offered: Spring, Fall

PSY 6930 Seminar In Psychology
[3 credit hours]
Readings and evaluative discussions of the primary research literature in psychology.
Term Offered: Spring, Fall

PSY 6940 Supervised Clinical Practicum
[1-3 credit hours]
Supervised applied assessment, therapeutic and consultative experience in community settings.
Term Offered: Summer, Fall

PSY 6950 Community Placement in Clinical Psychology
[0 credit hours]
The Externship in Clinical Psychology is a field placement program in which students are placed in structured clinical service settings with psychologists and other behavioral healthcare providers. Students obtain supervised clinical training in the application of basic clinical psychological service skills.
Term Offered: Spring, Summer, Fall

PSY 6960 M.a. Thesis
[1-6 credit hours]
Developing, conducting and analyzing the thesis research project, writing the thesis.
Term Offered: Spring, Summer, Fall

PSY 6980 Special Topics
[1-3 credit hours]
Professional issues in academic and scientific psychology.
Term Offered: Spring, Summer, Fall

PSY 6990 Independent Study
[1-15 credit hours]
Directed reading and/or experimentation on a topic selected by the study in conjunction with a faculty mentor.
Term Offered: Spring, Summer, Fall

PSY 7030 Research Practicum
[1-9 credit hours]
Developing, conducting, analyzing and preparing reports of research projects under faculty supervision. May be repeated.
Term Offered: Spring, Summer, Fall

PSY 7040 Teaching Practicum
[3 credit hours]
Supervised experience in the teaching of psychology. May be repeated for credit.
Term Offered: Spring, Fall

PSY 7050 Culture And Psychology
[3 credit hours]
A theoretical and empirical analysis of the systematic functioning of culture in psychological phenomena, with a focus on key concepts in clinical, cognitive, developmental and social psychology.
Term Offered: Spring

PSY 7070 The Science of Emotion
[3 credit hours]
An integrative course focusing on emotion in the context of affective and biological aspects of behavior.
Term Offered: Spring, Summer, Fall

PSY 7080 Grant Writing in Psychology
[3 credit hours]
Provides an overview of the federal grant writing process in Psychology.
Term Offered: Spring, Summer, Fall

PSY 7100 Quantitative Methods In Psychology I
[3 credit hours]
Probability theory, descriptive and inferential statistics, hypothesis testing, correlation.
Term Offered: Spring, Fall

PSY 7110 Quantitative Methods In Psychology II
[3 credit hours]
Analysis of variance, regression analyses, non-parametric analyses.
Term Offered: Spring, Fall

PSY 7130 Design And Evaluation Of Psychological Research
[3 credit hours]
Readings and discussion of problems of research design and analysis.
Term Offered: Fall

PSY 7150 Psychometrics and Scale Development
[3 credit hours]
Procedures for developing and examining the reliability and validilty of test scales, including theories of measurement, item analysis, factor analysis, and diagnostic efficiency statistics.
Prerequisites: PSY 7100 with a minimum grade of D- and PSY 7110 with a minimum grade of D-

PSY 7160 Advanced Research Seminar in Psychology
[3 credit hours]
Advanced research seminar focusing on selected topics from the general science of psychology.
Prerequisites: PSY 6130 with a minimum grade of B- and PSY 7130 with a minimum grade of B-
Term Offered: Spring, Summer, Fall

PSY 7200 Systems Of Personality
[3 credit hours]
Advanced historical overview of the main systems for understanding human beings: sources of motivation, coping, dysfunction, strengths/virtues. Emphasizes philosophical understandings of personality systems, analysis of major contributions and multi-perspective critiques.
Term Offered: Spring, Fall

PSY 7210 Psychopathology
[3 credit hours]
Critical analysis of diagnostic classification models, etiological conceptualizations and therapeutic interventions form mental disorders.
Term Offered: Fall

PSY 7220 Cognitive Assessment
[4 credit hours]
Assessment of cognitive functioning, utilizing tests of cognitive abilities and achievement.
Term Offered: Spring, Fall

PSY 7230 Personality Assessment
[4 credit hours]
Assessment of personality functioning utilizing objective tests.
Prerequisites: PSY 6220 with a minimum grade of D- or PSY 7220 with a minimum grade of D-
Term Offered: Spring

PSY 7240 Assessment I
[4 credit hours]
This course is designed to provide clinical psychology doctoral students with the training to attain the profession-wide competency in assessment, as required by the APA Commission on Accreditation. Students will learn foundational skills in psychometrics and integrative multimethod assessment in the process of learning to administer, score, interpret, and communicate about the most commonly used standardized measures for behavioral and cognitive assessment in order to be prepared to engage in evidence-based assessment practice.
Corequisites: PSY 6290, PSY 6360
Term Offered: Spring, Fall

PSY 7250 Seminar In Clinical Psychology
[3 credit hours]
Advanced seminar focusing on selected topics from the general area of clinical psychology. -001 Clinical neuropsychology -002 Child psychopathology -003 Child Clinical Intervention -004 Marital & Family Therapy -005 Psychotherapy research & program evaluation.
Term Offered: Spring, Summer, Fall

PSY 7260 Professional And Ethical Issues
[3 credit hours]
Exploration of ethical and professional issues faced by clinical psychologists. Detailed analysis of the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct.
Term Offered: Spring, Fall

PSY 7280 Assessment II
[4 credit hours]
This course is designed to provide clinical psychology doctoral students with the training to attain the profession-wide competency in assessment, as required by the APA Commission on Accreditation. Students will learn foundational skills in psychometrics and integrative multimethod assessment in the process of learning to administer, score, interpret, and communicate about the most commonly used standardized measures for neuropsychological and personality and psychopathology assessment in order to be prepared to engage in evidence-based assessment practice.
Prerequisites: PSY 7240 with a minimum grade of D-
Corequisites: PSY 7300, PSY 7370
Term Offered: Spring

PSY 7290 Foundations of Clinical Practice I
[3 credit hours]
The goal of this course is to provide an introduction to the basic clinical skills needed to conduct intake assessments and provide therapy. Foundational clinical skills central to all forms of assessment and therapy will be reviewed and practiced, and basic tenets of professionalism and ethics relevant to clinical psychology will be discussed. Application of skills to diverse populations and cultural competence considerations for assessment and therapy will also be discussed.
Corequisites: PSY 7240, PSY 7360
Term Offered: Fall

PSY 7300 Foundations of Clinical Practice II
[3 credit hours]
The goal of this course is to provide a continued introduction, building upon the content of PSY 6300 Foundations of Clinical Practice I, to the basic clinical skills needed to conduct intake and diagnostic assessments, administer structured diagnostic interviews, and provide therapy. Foundational clinical skills central to all forms of assessment and therapy will be reviewed and practiced, including assessment and treatment techniques relevant to vulnerable and at-risk groups.
Prerequisites: PSY 7290 with a minimum grade of D-
Corequisites: PSY 7280, PSY 7370
Term Offered: Spring

PSY 7330 Psychodynamic Psychotherapy
[3 credit hours]
Didactic course covering psychoanalytic/psychodynamic theories, case conceptualization, therapy techniques, and relevant empirical research.
Prerequisites: PSY 7390 with a minimum grade of D-
Term Offered: Spring, Fall

PSY 7340 Cognitive-Behavioral Psychotherapy
[3 credit hours]
Presentation and exploration of the theory and techniques of cognitive-behavioral assessment and therapy. Emphasis on understanding the theoretical and empirical base for cognitive-behavioral interventions and implications for application in clinical and clinical-research settings.
Term Offered: Spring

PSY 7360 Foundations of Psychotherapy I
[3 credit hours]
This course is designed to provide a basis for the attainment of the profession-wide competency of intervention, with a specific focus on preparing students to develop competence in evidence-based interventions consistent with the scope of Health Service Psychology. This course will present an overview of psychopathology and various classification models of the major disorder areas, as well as provide an introduction to the major theories of psychology and the principles underlying behavioral and cognitive therapy.
Corequisites: PSY 7240, PSY 7290
Term Offered: Spring, Fall

PSY 7370 Foundations of Psychotherapy II
[3 credit hours]
This course is designed to provide a basis for the attainment of the profession-wide competency of intervention, with a specific focus on preparing students to develop competence in evidence-based interventions consistent with the scope of Health Service Psychology. This course will present an overview of and foundational knowledge relevant to four key areas of psychological intervention: (1) Cognitive Behavioral Therapy, (2) Family and Couple Therapy, (3) Psychodynamic Psychotherapy, and (4) Child and Adolescent Therapy.
Prerequisites: PSY 7360 with a minimum grade of D-
Corequisites: PSY 7280, PSY 7300
Term Offered: Spring

PSY 7380 Empirically Supported Interventions and Processes of Change
[3 credit hours]
This course is designed to provide advanced knowledge in empirically-supported interventions in clinical psychology. Specifically, this course will provide in-depth instruction in the use of psychological interventions for treatment numerous psychological conditions. All interventions or approaches taught in this course have been well researched with substantial data existing to support their effectiveness.
Prerequisites: PSY 6240 with a minimum grade of D- or PSY 7240 with a minimum grade of D- or PSY 6280 with a minimum grade of D- or PSY 7280 with a minimum grade of D- or PSY 6290 with a minimum grade of D- or PSY 7290 with a minimum grade of D- or PSY 6300 with a minimum grade of D- or PSY 7300 with a minimum grade of D- or PSY 6360 with a minimum grade of D- or PSY 7360 with a minimum grade of D- or PSY 6370 with a minimum grade of D- or PSY 7370 with a minimum grade of D-
Term Offered: Spring, Fall

PSY 7390 Clinical Laboratory
[3 credit hours]
Clinical interviewing, diagnostic assessment, case conceptualization and oral presentation of clinical cases. Diagnostic, therapeutic and professional issues are addressed via didactic coursework and practicum work with clients in the Psychology Clinic.
Term Offered: Spring

PSY 7400 Cognitive Psychology
[3 credit hours]
An intensive examination of human information processing. Topics include neural bases of cognition, perceptual and attentional processing, mental imagery, memory, problem solving and reasoning.
Term Offered: Spring, Fall

PSY 7410 Seminar In Cognitive Psychology
[3 credit hours]
An advanced seminar focusing on selected topics from the general area of Cognitive Psychology.
Term Offered: Spring, Fall

PSY 7500 Developmental Psychology
[3 credit hours]
Advanced treatment of the theoretical and empirical literature in developmental psychology, and of the major issues of the field.
Term Offered: Spring, Fall

PSY 7510 Seminar In Developmental Psychology
[3 credit hours]
Readings and evaluative discussions of the primary research literature in developmental psychology.
Prerequisites: PSY 6500 with a minimum grade of D-
Term Offered: Spring, Fall

PSY 7600 Behavioral Neuroscience
[3 credit hours]
Structure and function of neurons and the neural mediation of behavior, both normal and abnormal.
Term Offered: Summer

PSY 7700 Social Psychology
[3 credit hours]
Social cognition and behavior, interpersonal influence and social relations will be addressed.
Term Offered: Spring, Fall

PSY 7710 Seminar In Social Psychology
[3 credit hours]
In depth treatment of selected topics in Social Psychology.
Term Offered: Spring, Fall

PSY 7720 Social Cognition
[3 credit hours]
This course examines how people make sense of other people, themselves, and social situations by examining the cognitive structures and processes involved in judgments, decisions, perceptions, beliefs, and behavior. The topics include (but are not limited to) attribution, counterfactual thinking, judgment heuristics, schemas, person perception, attitudes, and stereotypes/prejudice.
Term Offered: Spring, Fall

PSY 7810 Clinical Practicum I
[0-3 credit hours]
This first-year practicum course includes observation of and entry-level participation in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Term Offered: Spring, Fall

PSY 7820 Clinical Practicum II
[3 credit hours]
This second-year practicum course includes participation, as a beginning student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PSY 7830 Clinical Practicum III
[1-3 credit hours]
This third-year practicum course includes participation, as an experienced student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of C and PSY 6820 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PSY 7840 Clinical Practicum IV
[1-3 credit hours]
This fourth-year practicum course includes participation, as a senior-level student therapist, in a practicum team providing supervision of clinical services provided to children, adolescents, and/or adults seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6810 with a minimum grade of C and PSY 6820 with a minimum grade of C and PSY 6830 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PSY 7850 Family And Couple Practicum
[3 credit hours]
Supervision of psychotherapy with families and couples seen through The University of Toledo Psychology Clinic.
Term Offered: Spring, Fall

PSY 7930 Seminar In Psychology
[3 credit hours]
Readings and evaluative discussions of the primary research literature in psychology.
Term Offered: Spring, Fall

PSY 7940 Supervised Clinical Practicum
[1-3 credit hours]
Supervised applied assessment, therapeutic and consultative experience in community settings.
Term Offered: Summer, Fall

PSY 7950 Community Placement in Clinical Psychology
[0 credit hours]
The Externship in Clinical Psychology is a field placement program in which students are placed in structured clinical service settings with psychologists and other behavioral healthcare providers. Students obtain supervised clinical training in the application of basic clinical psychological service skills.
Term Offered: Spring, Summer, Fall

PSY 7980 Special Topics
[1-3 credit hours]
Professional issues in academic and scientific psychology.
Term Offered: Spring, Summer, Fall

PSY 7990 Independent Study
[1-15 credit hours]
Directed reading and/or experimentation on a topic selected by the study in conjunction with a faculty mentor.
Term Offered: Spring, Summer, Fall

PSY 8940 APA Accredited Clinical Internship
[0-1 credit hours]
Full-time supervised training in an APA accredited predoctoral internship entity. Students will complete clinical work under direct supervision and with guidance of the program training director and internship training director. Grades will be awarded as Credit/No Credit.
Term Offered: Spring, Summer, Fall

PSY 8960 Phd Dissertation
[1-15 credit hours]
Developing, conducting and analyzing the dissertation research project; writing the dissertation.
Term Offered: Spring, Summer, Fall

Public Health and Occupational Health (PUBH)

PUBH 5020 Occupational Health
[3 credit hours]
An introduction to principles applicable to anticipation, recognition, evaluation, and control of harmful agents along with the confirmation of the protection from risks. This includes an introduction to industrial hygiene instrumentation, occupational health programs and ethics. Includes a field component.
Term Offered: Fall

PUBH 5060 Occupational Safety
[3 credit hours]
An introduction to principles applicable to safety and health programs, administration, and controlling unsafe conditions/acts. Includes a field component.
Term Offered: Fall

PUBH 5160 Environmental Health
[3 credit hours]
An introduction to principles applicable to human disease associated with food, water, air and soil contamination in the environment. The chemical, physical, and biological factors in the environment that impact health, along with monitoring and control will be examined. Includes laboratory and field components.
Term Offered: Fall

PUBH 5260 Haz Mat and Emerg Response
[3 credit hours]
Scientific, regulatory and management principles applicable to characteristics, control, storage, transport and disposal of chemical, biological and radiological agents; disaster preparedness and emergency response; personal protective equipment and site assessment/ monitoring. Includes a field component.
Term Offered: Spring, Summer, Fall

PUBH 5310 Chemical Agents and Exposure Assessment
[3 credit hours]
Scientific and management principles applicable to the qualitative and quantitative evaluation of chemical agents associated with human diseases resulting from various occupational and environmental exposures. Review and application of the exposure assessment process including basic characterization, establishing exposure groups, and judging exposure profiles. Includes laboratory and field components.
Term Offered: Fall

PUBH 5410 Hazard Control
[3 credit hours]
Scientific and management principles of air contaminant modeling; control of indoor and outdoor (ambient) air pollution; operation of dilution and local exhaust ventilation systems; respiratory protective equipment and programs commonly used in the workplace. Includes a laboratory component.
Term Offered: Spring

PUBH 5560 Health, Safety, and Worker Well-being
[3 credit hours]
Presents concepts related to improving worker well-being -- or the ability of people to address normal stresses, work productively, and achieve their highest potential. Builds on foundational knowledge of hazard assessment and control and introduces students to the model of Total Worker Health® (TWH). Experts in safety and health from various industries provide application of course content including integration of health protection and promotion, virtual reality machine training, and safety metrics and management. Includes a field component.
Term Offered: Spring

PUBH 5620 Physical Agents
[3 credit hours]
Scientific, regulatory, and management principles applicable to the assessment and control of exposure to physical agents (noise, thermal stress, ionizing and non-ionizing radiation). Includes laboratory and field components.
Term Offered: Spring

PUBH 5700 Risk Assessment
[3 credit hours]
Scientific and management principles of human health risk assessment including hazard identification, toxicity assessment, exposure assessment, risk characterization and communication relative to public, environmental, and occupational health.
Term Offered: Summer

PUBH 5720 Exposure Assessment Strategies
[3 credit hours]
Exposure assessment is an integral part of occupational and environmental health. This course will focus on the statistics and methods needed to assess exposures in the workplace.
Prerequisites: PUBH 6000 with a minimum grade of D-
Term Offered: Spring

PUBH 6000 Quantitative and Qualitative Data Analysis in Public Health
[3 credit hours]
This course includes introductory content on both quantitative and qualitative methods and relevant data analyses. Quantitative: Statistical methods and principles necessary for understanding and interpreting data used in public health. Topics include descriptive statistics, statistical comparison groups, correlation, and regression. Includes a lab component using SPSS statistical package. Qualitative: Methods for gathering qualitative data and thematic analysis of data in health service research. Activities include analyzing data for emergent themes as well as interpreting and presenting findings.
Term Offered: Spring, Fall

PUBH 6001 Biostatistics for Medical Sciences
[3 credit hours]
An introduction to descriptive statistics including measurement of central tendency, dispersion, correlation and regression, hypothesis testing, and select nonparametric methods, including the use of statistical package(s).
Term Offered: Fall

PUBH 6010 Public Health Epidemiology
[3 credit hours]
The course will present principles of the epidemiology method including problem solving. Various study designs will be discussed, including prospective and retrospective studies, analytic, and experimental methods.
Term Offered: Spring, Fall

PUBH 6020 Management and Leadership in Public Health
[3 credit hours]
An introduction to the leadership and management principles necessary for the delivery of public health programs, intervention, and outreach, including fostering collaboration, effective communication, consensus building, negotiation, cultural awareness, budget and resource management, evaluation, coalition building, vision creation, mediation, empowering others, and guiding decision making.
Term Offered: Spring, Summer, Fall

PUBH 6030 Advanced Epidemiology
[3 credit hours]
This course covers principles and methods of epidemiology in depth. The topics include causal inference, risk and effect, confounding, interaction, randomization, and matching. Special emphasis is given to design and interpretation of epidemiological studies.
Term Offered: Spring, Summer

PUBH 6050 Concepts and Issues in Environmental Health
[3 credit hours]
The course will review environmental concepts, focusing on water, soil, food, and diseases as they pertain to public health. Emergency preparedness for environmental events will be discussed. The impact of environmental events on public health, preparations, and appropriate responses will be included. The relationship between environmental health and public health will be emphasized.
Term Offered: Spring, Summer, Fall

PUBH 6060 Advanced Biostatistics
[3 credit hours]
Advanced statistical techniques with particular emphasis on problems in public health. Multiple regression, methods of analysis of variance, categorical data analysis including logistic regression, non parametric and survival analysis. Problems whose solution involves using a statistical program (e.g., SPSS).
Term Offered: Spring, Fall

PUBH 6070 Genetic Epidemiology
[3 credit hours]
Introduces genetic epidemiology methods, principles of population genetics including linkage and association studies used in assessing familial aggregatio, and transmission patterns for identifying the genetic basis of common diseases.
Prerequisites: (PUBH 6000 with a minimum grade of C or PUBH 8000 with a minimum grade of C) and (PUBH 6010 with a minimum grade of C or PUBH 8010 with a minimum grade of C) or (PUBH 600 with a minimum grade of C or PUBH 800 with a minimum grade of C) and (PUBH 601 with a minimum grade of C or PUBH 801 with a minimum grade of C)
Term Offered: Summer

PUBH 6080 Social Determinants of Health
[3 credit hours]
Social determinants of health are social conditions, factors, and systems that place people from different socio-demographic and socioeconomic group (social class, gender, race/ethnicity, and place of birth) at differential risk of poor health and premature mortality. Mechanisms through which these factors are hypothesized to influence health, such as stress and access to health resources and constraints, will be discussed, as well as the ways in which these mechanisms can operate across the life course.
Term Offered: Spring, Fall

PUBH 6090 Issues in Public Health
[3 credit hours]
Examination of various contemporary issues in public health. Includes social, economic, political, and community problems in the provision of health services, health manpower, and payment for health care.

PUBH 6110 Categorical Data Analysis
[3 credit hours]
This course introduces the theory and application of methods for categorical data, with emphasis on biomedical and public health applications. Topics include contingency tables, log-linear, logistic regression and Raush models, multivariate methods for matched pairs and longitudinal data. The methods are illustrated with SAS and/or SPSS, R.
Term Offered: Spring, Summer, Fall

PUBH 6120 Epidemiology Infectious Diseas
[3 credit hours]
Provides an overview of major infectious diseases affecting public health in the U.S. and worldwide; introducing the basic epidemiologic methods for surveillance and investigation of infectious disease outbreaks.
Term Offered: Spring, Fall

PUBH 6130 Molecular Epidemiology
[3 credit hours]
The course focuses on the application of epidemiological techniques to the study of effects of occupational and environmental exposures.
Term Offered: Fall

PUBH 6150 Clinical Epidemiology
[3 credit hours]
This course focuses on epidemiologic concepts and methods in clinical medicine. Topics include clinical measurements and outcomes, risk, prognostic factors, clinical diagnosis, study design, decision analysis, clinical research and meta-analysis.
Term Offered: Spring, Fall

PUBH 6160 Reproductive Epidemiology
[3 credit hours]
Reproductive health issues from the pre-conception, prenatal delivery, and postnatal periods and emphasizes health issues affecting women, men, and infants. A focus on current research, controversial issues and methodological issues.
Prerequisites: PUBH 6010 with a minimum grade of D- or PUBH 601 with a minimum grade of D-
Term Offered: Spring

PUBH 6180 Cancer Epidemiology
[3 credit hours]
Focuses on a number of cancers, including the most incident cancers in the United States. Provides a broad overview of cancer epidemiology and basic substantive knowledge regarding many cancers and their risk factors, prevention, and biology and pathogenesis.
Term Offered: Spring, Summer, Fall

PUBH 6190 Statistical Packages for Public Health
[3 credit hours]
The purpose of this 3 credit course is to develop analysis skills using the SAS statistical package, SPSS, and R for students that already have a basic knowledge of biostatistics.
Prerequisites: PUBH 6000 with a minimum grade of D- or PUBH 8000 with a minimum grade of D-
Term Offered: Spring, Fall

PUBH 6310 Public Health Assessment and Planning
[3 credit hours]
This course introduces the principles of health promotion program assessment and planning. Students learn the process of community health assessment, precursors to program planning, as well as the purposes, procedures, terminology, and specific techniques in the planning process.
Term Offered: Fall

PUBH 6320 Implementation of Public Health Programs
[3 credit hours]
This course is designed to prepare students to implement health education programs in the community. Emphasis will be placed on a variety of health education methods and strategies to plan, promote, present and evaluate health promotion activities.
Prerequisites: PUBH 6310 with a minimum grade of D-
Term Offered: Spring

PUBH 6330 Public Health and Aging
[3 credit hours]
Examines public health and aging issues in contemporary society. Introduces physical, cognitive and affective function from a public health perspective. Prevention and health promotion models are included.
Term Offered: Spring, Summer

PUBH 6420 Social Marketing in Health
[3 credit hours]
The Centers for Disease Control and Prevention (CDC) identify social marketing as a practice allied with Health Education and Health Promotion. The CDC encourages programs to apply the principles of social marketing to health behavior change efforts in order to increase the effectiveness of interventions. Social marketing uses audience research to determine target audience segmentation into groups with common risk behaviors, motivations, and information channel preferences. Key audience segments are then reached with the mix of intervention strategies formed by the "4 P's" of social marketing, namely product, price, place, and promotion. The final product is designed based on the needs and desires of the consumer and persuasive messages promoting behavior change are promoted to the target audience. Continuous evaluation and message revision allows for ongoing refinement on the basis of consumer feedback.
Term Offered: Spring

PUBH 6430 Community Mental Health
[3 credit hours]
In this course, mental health is examined from a public health perspective with a focus on epidemiological, behavioral, sociological and cultural issues. Particular emphasis is placed on the prevention of mental illness, social responses to illness, as well as the social determinants of mental health. Mental health, mental health promotion and community mental health issues are analyzed at individual and population level.
Term Offered: Spring, Summer

PUBH 6500 Disaster Preparedness/Response
[3 credit hours]

PUBH 6510 Issues in Pandemic Preparedness and Response
[3 credit hours]
By means of synchronous, asynchronous, audiovisual, and simulation platforms, the learner will develop an in-depth knowledge concerning how the healthcare infrastructure of a community must plan for, respond to, and recover from a pandemic. The course is divided into four topic areas: 1) introduction; 2) preparedness; 3) response; and 4) recovery.
Term Offered: Spring, Fall

PUBH 6550 Chronic Disease Epidemiology
[3 credit hours]
Epidemiology of selected chronic diseases and non-infectious conditions: cancer, cardiovascular diseases, musculoskeletal diseases and other chronic diseases. Emphasis on classification, rates, associations, etiology, prevention and control.
Prerequisites: PUBH 6010 with a minimum grade of C or PUBH 601 with a minimum grade of C
Term Offered: Spring, Summer, Fall

PUBH 6600 Health Behavior
[3 credit hours]
Examines the role of behaviors on health status and how to influence and understand behavior through use of cognitive models and change theory.
Term Offered: Spring, Summer, Fall

PUBH 6620 Introduction to Health Policy and Health Systems
[3 credit hours]
This course examines public health and healthcare policy from a public health perspective. It emphasizes the interrelatedness of law, the policymaking process, and governmental public health; addresses essential issues in health policy and law (e.g., health insurance, health economics, government health insurances, the uninsured); and introduces health policy analysis.
Term Offered: Spring, Fall

PUBH 6730 Research Environmental Health
[3 credit hours]
Students will participate in selected ongoing research programs of members of the faculty. May be repeated for credit.
Term Offered: Spring, Summer, Fall

PUBH 6790 Independent Study in Biostatistics
[1-3 credit hours]
This independent study provides an opportunity for a single student to engage in advanced, focused study of a selected topic in biostatistics under faculty supervision. The content, learning activities, and deliverables are individualized and determined collaboratively by the student and instructor. Credit hours reflect the scope and intensity of statistical and analytical work completed during the semester.
Term Offered: Spring, Summer, Fall

PUBH 6800 Evaluation Of Health Programs
[3 credit hours]
An exploration of types of program evaluation, evaluation models, data collection, types of data, data quality, evaluation reports, standard data collection instruments and ethical issues in health program evaluation.
Term Offered: Spring, Fall

PUBH 6890 Independent Study in Public Health
[1-3 credit hours]
This independent study provides an opportunity for a single student to engage in advanced, focused study of a selected topic in public health under faculty supervision. The content, learning activities, and deliverables are individualized and determined collaboratively by the student and instructor. Credit hours reflect the scope and intensity of scholarly and applied public health work completed during the semester.
Term Offered: Spring, Summer, Fall

PUBH 6900 Interprofessional Education for Public Health
[1 credit hour]
This 1-Credit hour course for Public Health students has been designed to provide a variety of interprofessional learning activities and educational experiences that include learning modules related to current health topics and issues in our communities such as social determinants of health, human trafficking, poverty, and resilience. Students are required to complete selected educational experiences that provides opportunities to collaborate with students from other health care professions (Athletic Training, Medicine, Nursing, Occupational Therapy, Pharmacy, Physical Therapy, Physician Assistant, Public Health, Respiratory Therapy, Social Work, and Speech Language Pathology) using an experiential learning approach.
Term Offered: Spring, Fall

PUBH 6940 Internship in Occupational Health
[1-3 credit hours]
Comprehensive or focused practical training in industrial hygiene/ occupational health at a designated agency, organization, or company.
Term Offered: Spring, Summer, Fall

PUBH 6950 Integrative Learning Experience
[2 credit hours]
Seminar course which serves as the culminating experience of the MPH program. Students are required to produce a high-quality written product that is appropriate to the student's educational and professional objectives and that must demonstrate both Foundational and Major Competencies.
Term Offered: Spring, Summer, Fall

PUBH 6951 Integrative Learning Experience I
[1 credit hour]
The first course in the two online course sequence emphasizes developing professional skills, planning an integrative learning experience, by proposing a robust culminating project. Students synthesize MPH foundational and major competencies to develop a proposal useful to external stakeholders.
Term Offered: Spring, Summer, Fall

PUBH 6952 Integrative Learning Experience II
[1 credit hour]
The second online course in the ILE sequence focuses on implementing the proposed culminating project, engaging with stakeholders, synthesizing competencies, and producing a high-quality final product and oral presentation.
Term Offered: Spring, Summer, Fall

PUBH 6960 Internship in Public Health
[1-4 credit hours]
This course provides a supervised field experience in a public health setting designed to integrate academic knowledge with practical application. Students complete a structured internship under the guidance of a qualified site supervisor and a University of Toledo Internship Advisor. The internship emphasizes hands#on professional experience aligned with public health competencies. Credit hours reflect the scope and intensity of the field experience completed during the semester.
Term Offered: Spring, Summer, Fall

PUBH 6970 Project in Public Health
[1-4 credit hours]
This independent study provides an opportunity for a single student to engage in advanced, focused study of a selected topic in biostatistics under faculty supervision. The content, learning activities, and deliverables are individualized and determined collaboratively by the student and instructor. Credit hours reflect the scope and intensity of statistical and analytical work completed during the semester.
Term Offered: Spring, Summer, Fall

PUBH 6990 Thesis Research
[1-4 credit hours]

PUBH 8000 Quantitative and Qualitative Data Analysis in Public Health
[3 credit hours]
This course includes introductory content on both quantitative and qualitative methods and relevant data analyses. Quantitative: Statistical methods and principles necessary for understanding and interpreting data used in public health. Topics include descriptive statistics, statistical comparison groups, correlation, and regression. Includes a lab component using SPSS statistical package. Qualitative: Methods for gathering qualitative data and thematic analysis of data in health service research. Activities include analyzing data for emergent themes as well as interpreting and presenting findings.
Term Offered: Spring, Fall

PUBH 8010 Public Health Epidemiology
[3 credit hours]
The course will present principles of the epidemiology method including problem solving. Various study designs will be discussed, including prospective and retrospective studies, analytic, and experimental methods.
Term Offered: Spring, Fall

PUBH 8020 Management and Leadership in Public Health
[3 credit hours]
An introduction to the leadership and management principles necessary for the delivery of public health programs, intervention, and outreach, including fostering collaboration, effective communication, consensus building, negotiation, cultural awareness, budget and resource management, evaluation, coalition building, vision creation, mediation, empowering others, and guiding decision making.
Term Offered: Spring, Summer, Fall

PUBH 8030 Advanced Epidemiology
[3 credit hours]
This course covers principles and methods of epidemiology in depth. The topics include causal inference, risk and effect, confounding, interaction, randomization, and matching. Special emphasis is given to design and interpretation of epidemiological studies.
Term Offered: Spring, Summer

PUBH 8060 Advanced Biostatistics
[3 credit hours]
Advanced statistical techniques with particular emphasis on problems in public health. Multiple regression, methods of analysis of variance, categorical data analysis including logistic regression, non parametric and survival analysis. Problems whose solution involves using a statistical program (e.g., SPSS).
Term Offered: Spring, Fall

PUBH 8090 Issues in Public Health
[3 credit hours]
Examination of various contemporary issues in public health. Includes social, economic, political, and community problems in the provision of health services, health manpower, and payment for health care.

PUBH 8110 Categorical Data Analysis
[3 credit hours]
This course introduces the theory and application of methods for categorical data, with emphasis on biomedical and public health applications. Topics include contingency tables, log-linear and Poisson regression, logistic and probit regression, regression models for nominal and ordinal data, Raush models, multivariate methods for matched pairs and longitudinal data. The methods are illustrated with SAS and SPSS, and R.
Term Offered: Summer

PUBH 8120 Epidemiology Infectious Diseas
[3 credit hours]
Provides an overview of major infectious diseases affecting public health in the U.S. and worldwide; introducing the basic epidemiologic methods for surveillance and investigation of infectious disease outbreaks.
Term Offered: Spring, Fall

PUBH 8130 Molecular Epidemiology
[3 credit hours]
The course focuses on the application of epidemiological techniques to the study of effects of occupational and environmental exposures.
Term Offered: Fall

PUBH 8150 Clinical Epidemiology
[3 credit hours]
This course focuses on epidemiologic concepts and methods in clinical medicine. Topics include clinical measurements and outcomes, risk, prognostic factors, clinical diagnosis, study design, decision analysis, clinical research and meta-analysis.
Term Offered: Spring, Fall

PUBH 8180 Cancer Epidemiology
[3 credit hours]
Focuses on a number of cancers, including the most incident cancers in the United States. Provides a broad overview of cancer epidemiology and basic substantive knowledge regarding many cancers and their risk factors, prevention, and biology and pathogenesis.
Term Offered: Spring, Summer, Fall

PUBH 8500 Disaster Preparedness/Response
[3 credit hours]

PUBH 8510 Issues in Pandemic Preparedness and Response
[3 credit hours]
By means of synchronous, asynchronous, audiovisual, and simulation platforms, the learner will develop an in-depth knowledge concerning how the healthcare infrastructure of a community must plan for, respond to, and recover from a pandemic. The course is divided into four topic areas: 1) introduction; 2) preparedness; 3) response; and 4) recovery.
Term Offered: Spring, Fall

PUBH 8550 Chronic Disease Epidemiology
[3 credit hours]
Epidemiology of selected chronic diseases and non-infectious conditions: cancer, cardiovascular diseases, musculoskeletal diseases and other chronic diseases. Emphasis on classification, rates, associations, etiology, prevention and control.
Prerequisites: PUBH 6010 with a minimum grade of C or PUBH 601 with a minimum grade of C
Term Offered: Spring, Summer

PUBH 8900 Interprofessional Education for Public Health
[1 credit hour]
This 1-Credit hour course for Public Health students has been designed to provide a variety of interprofessional learning activities and educational experiences that include learning modules related to current health topics and issues in our communities such as social determinants of health, human trafficking, poverty, and resilience. Students are required to complete selected educational experiences that provides opportunities to collaborate with students from other health care professions (Athletic Training, Medicine, Nursing, Occupational Therapy, Pharmacy, Physical Therapy, Physician Assistant, Public Health, Respiratory Therapy, Social Work, and Speech Language Pathology) using an experiential learning approach.
Term Offered: Spring, Fall

Recreation and Rec Therapy (RCRT)

RCRT 5040 Recreational Therapy Services within the Veterans Administration
[3 credit hours]
The course will focus on current trends, issues, and clinical techniques specific to serving Veterans within the Veteran's Administration VA system as a Recreational Therapist. Course content will include orientation to military culture and rituals, specific diagnoses, and conditions commonly experienced by Veterans, delivery of outcome-based RT interventions and special programs, partnerships, and an in-depth look into internships and employment opportunities within the VA system.
Term Offered: Spring, Fall

RCRT 5300 Inclusion and Recreational Therapy Services
[3 credit hours]
An introductory course which defines the principals of inclusion and major legislation that impacts the provision and delivery of recreational therapy services for individuals with disabilities. Thirty hour volunteer component required. Minimum "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5310 Leisure And Popular Culture
[3 credit hours]
This course provides the graduate student with an advanced understanding of leisure theory, philosophy, and behavior and its application to the delivery of leisure services within contemporary culture.
Term Offered: Summer, Fall

RCRT 5320 Administration In Recreational Therapy
[3 credit hours]
This course focuses on the administrative functions of delivering Recreational Therapy services. Students will gain an understanding of the aspects of management principles including ethics, legislation, technology, quality management, risk management, financial and human resources, marketing, and accrediting agencies. Minimum "C" required for RCRT majors. Note: Senior Standing and Acceptance in the Recreational Therapy program.
Term Offered: Spring, Fall

RCRT 5330 Administration in Recreation Services
[3 credit hours]
This course focuses on the administrative functions of Recreation and Recreation-Related services. Students will gain an understanding of the aspects of management principles including theoretical foundations, program and administrative planning, evaluation, maintenance, facility management, budgeting, human resources, and professional development.
Term Offered: Spring

RCRT 5340 Leisure, Recreation, And Aging in Recreational Therapy Practice
[3 credit hours]
This course provides a study of the impacts of aging on leisure and recreation activities during middle and later adulthood by investigating the aging process, leisure across the lifespan, and the impact of leisure and recreation on quality of life and wellness from an RT perspective. Minimum grade of "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5410 Facility Planning and Design
[3 credit hours]
This course provides the graduate student with an advanced understanding of, and ability to apply, the principles of design and the site design process to the development of recreation-based facilities. Specific areas of the design process presented include: tools of the trade, functional and aesthetic considerations, research, regional and site analysis, programming, final design development, construction, management, and evaluation.
Term Offered: Spring

RCRT 5420 Research Applications in Recreation & Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding of, and ability to apply, the basic components of research in the academic and professional practice setting including: ethics, human subject protection, research concepts, topic identification, theoretical roots, literature review development, sample selection, methodologies, instrument testing, data collection and analysis procedures, and research reporting.
Term Offered: Fall

RCRT 5560 Recreational Therapy Interventions 1
[3 credit hours]
This course provides the student the fundamental skill development needed to implement therapeutic outcomes using Recreational Therapy interventions utilizing leisure education, assistive technology, and animal assisted therapy within treatment settings. Minimum "C" required for RCRT majors. Registration restriction: Acceptance into the Recreation and Leisure master's program.
Term Offered: Fall

RCRT 5565 Recreational Therapy Interventions 2
[3 credit hours]
This course provides the student the fundamental skill development needed to implement therapeutic outcomes using Recreational Therapy interventions utilizing therapeutic art, horticulture, and stress management/relaxation therapy within treatment settings. Minimum "C" required for RCRT majors.
Term Offered: Spring

RCRT 5570 Recreational Therapy Interventions 3
[2 credit hours]
This course provides the student the fundamental skill development needed to implement therapeutic outcomes using Recreational Therapy interventions utilizing therapeutic fitness and aquatic therapy within treatment settings. Minimum "C" required for RCRT majors.
Term Offered: Fall

RCRT 5710 Outdoor and Adaptive Sports Program Delivery in Recreational Therapy Practice
[3 credit hours]
An introduction to theory and techniques related to risk management, leadership, and administration of outdoor pursuits in RT practice as it applies to working with individuals in clinical and non-clinical settings. Students will also gain an understanding of adapted sports, modification of equipment, adapted sports competition for persons with disabilities and the classification system governing adapted sports competition for veterans. Minimum "C" required for RCRT majors. Prerequisite: Senior Standing and Acceptance in the Recreational Therapy program.
Term Offered: Spring, Fall

RCRT 5720 Introduction To Therapeutic Recreation
[3 credit hours]
This course is designed to introduce the student to theories, models, principles, and history of therapeutic recreation service. Through lectures, discussions and self-directed learning activities, the student will examine the structure and function of therapeutic recreation processes in a variety of treatment settings. Minimum "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5730 Physical and Neurological Diagnosis and Conditions in Recreational Therapy Practice
[3 credit hours]
This course is designed to provide the student with in-depth knowledge of the diagnostic criteria, etiology, and symptomology related to physical, neurological, sensory, and metabolic diagnosis and conditions across the lifespan with a focus on RT practice. RT interventions, pharmacological interventions, family involvement, risk management, and other implications impacting RT practice will also be examined.
Term Offered: Fall

RCRT 5750 Group Dynamics In Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding, and ability to apply, concepts and theories of the therapeutic group process as applicable to professional practice. Students will be introduced to and practice: facilitation skills, behavior modification techniques, and effective communication and leadership skills.
Term Offered: Spring, Fall

RCRT 5760 APIE in Recreation Therapy
[3 credit hours]
This course addresses the procedures and processes of assessment, planning, implementation and evaluation of recreation therapy services.

RCRT 5790 Psychological Diagnosis and Conditions in Recreational Therapy Practice
[3 credit hours]
This course is designed to provide the student with in-depth knowledge of the diagnostic criteria, etiology, and symptomology related to psychological conditions across the lifespan with a focus on RT practice. RT interventions, pharmacological interventions, family involvement, risk management, and other implications impacting RT practice will be examined.
Term Offered: Spring

RCRT 5800 Clinical: Physical Rehabilitation
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the APIE(D) process with a physical rehabilitation population.
Term Offered: Spring, Summer, Fall

RCRT 5810 Recreational Therapy Fieldwork 1
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the Recreational Therapy APIE(D) process with a population served by a CTRS.
Term Offered: Fall

RCRT 5820 Recreational Therapy Fieldwork 2
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the APIE(D) process with a clinical population. Minimum "C" required for RCRT majors.
Term Offered: Spring, Fall

RCRT 5830 Recreational Therapy Fieldwork III
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the APIE(D) process with a geriatric population.
Term Offered: Spring

RCRT 5840 Recreational Therapy Fieldwork 4
[1 credit hour]
This course requires a 50-hour practicum experience in a community agency. The practicum experience provides the student a structured environment to apply the Recreational Therapy APIE(D) process with a population served by a CTRS. Minimum "C" required for RCRT majors. Registration restriction: Acceptance into the master of arts in recreation and leisure.
Term Offered: Spring

RCRT 5870 Program Planning In Recreational Therapy
[3 credit hours]
This course requires the graduate student to apply cumulative knowledge of the APIE(D) process through designing evidence-based: treatment programs, program evaluations, protocols and treatment plans in recreation therapy practice.
Term Offered: Spring

RCRT 5930 Internship Competency in Recreational Therapy
[1 credit hour]
This course is designed to prepare graduate students for the Recreational Therapy Internship process and professional employment in recreational therapy. Students will demonstrate academic and professional competence to ensure readiness for successful completion of a Recreational Therapy Internship. Student internship expectations and professional certifications and licensure are also addressed.
Term Offered: Spring

RCRT 5940 Internship In Recreation And Leisure
[1-6 credit hours]
This course provides the graduate student with the opportunity to complete an internship under the supervision of a recreation professional in partial fulfillment for the MA degree in recreation and leisure studies.
Term Offered: Spring, Summer, Fall

RCRT 6000 Issues And Trends In Recreation/Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding of the issues and trends impacting the delivery of recreation and recreation therapy services in diverse professional settings.
Term Offered: Spring

RCRT 6020 Financial Resources Of Recreation And Recreational Therapy
[3 credit hours]
This course provides the graduate student with an advanced understanding of the finincial management concepts and resources supporting the delivery of recreation and recreation therapy services.
Term Offered: Summer, Fall

RCRT 6100 Recreation I: Leisure and Society
[4 credit hours]
This course thoroughly examines and provides understanding of the recreation and leisure services profession in relation to the historical, philosophical, behavioral, cultural, social, and economical contributions of the profession to the provision of recreation and leisure services.
Term Offered: Fall

RCRT 6110 Recreation II: Leadership
[4 credit hours]
This course thoroughly examines and provides understanding of the major components of leadership in relation to human development, cultural adaptability, communication, group dynamics, influencing behavior, conflict resolution, ethics, managing risk and effective leadership in the provision of recreation and leisure services.
Term Offered: Fall

RCRT 6120 Recreation III: Facility Design
[4 credit hours]
This course thoroughly examines and provides understanding of the processes included in designing recreation and recreation-related facilities including the history of development of the recreation facility infrastructure in the United States, tools of the trade, principles of design, functional and aesthetic considerations, research, regional and site analysis, universal design and accessibility, construction management, evaluation, and final design development.
Term Offered: Fall

RCRT 6130 Recreation IV: Liability & Risk
[4 credit hours]
This course thoroughly examines and provides understanding of risk management, legal liability, negligence, emergency action plan development, risk management plan development, and addressing and reducing risk in the provision of recreation and leisure services.
Term Offered: Spring

RCRT 6140 Recreation V: Financial Resources
[4 credit hours]
This course thoroughly examines and provides understanding of the foundations of fiscal management as it relates to fiscal planning; fiscal acquisition; sources of funding; resource allocation; budgeting; the management of assets, liabilities, equities, revenues, expenses and profits; and developing and understanding fiscal documents in the provision of recreation and leisure services.
Term Offered: Spring

RCRT 6150 Recreation VI: Administration
[4 credit hours]
This course thoroughly examines and provides understanding of management theory and practice, organization and structure, ethics, planning, decision making and problem solving, human and fiscal resources, marketing, legal issues, and evaluation in the provision of recreation and leisure services.
Term Offered: Spring

RCRT 6160 Recreation VII: Evaluation
[3 credit hours]
This course thoroughly examines and provides understanding of the common methodologies used in conducting recreation-related research and evaluation including the research process, research ethics, research methodologies, instrument development and testing, data collection and analysis, data interpretation and reporting as it relates to the provision of recreation and leisure services.
Term Offered: Summer

RCRT 6940 Recreation VIII: Internship
[3 credit hours]
This course provides the graduate student with the opportunity to complete an internship under the supervision of a recreation professional in partial fulfillment for the MA degree in recreation and leisure studies.
Term Offered: Spring, Summer, Fall

RCRT 6990 Independent Study In Recreation And Leisure
[1-3 credit hours]
This course provides the graduate student with the opportunity to develop an advanced independent learning experience in support of academic and/or professional interests.
Term Offered: Spring, Summer, Fall

Research and Measurement (RESM)

RESM 5110 Quantitative Methods I
[3 credit hours]
This course introduces the major concepts of statistical description, including central tendency, dispersion, and relative position and relationship. Inferential methods such as t-tests, one-way analysis of variance, and multiple group analyses are also presented.
Term Offered: Spring, Summer, Fall

RESM 5210 Educational Testing And Grading
[3 credit hours]
This course introduces the development, administration and interpretation of teacher-made tests and other pupil assessments; basic principles underlying norm- and criterion-referenced tests; problems and issues in grading systems and assigning grades; standardized testing and Value-Added Models.
Term Offered: Spring, Summer, Fall

RESM 5310 Understanding and Consuming Research
[3 credit hours]
This course offers an introduction to the history and foundations of research processes from the consumer's perspective. It introduces qualitative, quantitative, and mixed methods approaches for understanding research problems.
Term Offered: Spring, Summer, Fall

RESM 5330 Qualitative Research I: Introduction And Basic Methods
[3 credit hours]
This course introduces history and theoretical underpinnings of qualitative research. Students then learn and practice fundamental methods of participant-observation, fieldnotes, interviewing, and transcription, and explore common models of qualitative research.
Term Offered: Summer, Fall

RESM 5550 Introduction to Research and Measurement (RESM) and Graduate Studies
[3 credit hours]
This course offers an introduction to the foundations of the research process and an exploration of the major program strands (research and evaluation design, data analysis and interpretation, development and validation of measures, and school-based classroom and program assessment). It also focuses on practical strategies and skills that promote successful graduate-level study.
Term Offered: Spring, Fall

RESM 5950 Workshop In Research And Measurement
[3 credit hours]
Each workshop is developed around a topic of interest and concern to inservice teachers and other educational personnel. Practical application of workshop topics will be emphasized.
Prerequisites: RESM 4100 with a minimum grade of D- or RESM 5110 with a minimum grade of C
Term Offered: Spring, Summer, Fall

RESM 6120 Quantitative Methods II
[3 credit hours]
This course covers the major inferential statistical techniques common to the behavioral sciences. Correlation, factorial analysis of variance, and linear regression are major topics. Computer applications are included.
Prerequisites: RESM 4100 with a minimum grade of D- or RESM 5110 with a minimum grade of C
Term Offered: Spring, Summer, Fall

RESM 6220 Measurement I
[3 credit hours]
This course introduces psychometric theories, with emphasis on classical test theory; reliability theory, including generalizability theory; approaches to validation; practical applications such as standard setting.
Prerequisites: RESM 4100 with a minimum grade of D- or RESM 5110 with a minimum grade of C
Term Offered: Spring, Fall

RESM 6240 Mixed Methods Research: Theory & Application
[3 credit hours]
This course introduces history and theoretical foundations of mixed methods research. Students learn the foundations and theories of mixed methods research and practice. Students will also have the practical experience of implementing mixed methods research in their field of interest from problem identification through to research design, analysis, and reporting.
Term Offered: Spring, Fall

RESM 6320 Research Design
[3 credit hours]
This course exposes students to quantitative and mixed method research approaches that are used in theses and dissertations. Competing designs for addressing research questions are compared. The purpose is to prepare students for their dissertation experience.
Prerequisites: RESM 4100 with a minimum grade of D- or RESM 5110 with a minimum grade of C
Term Offered: Spring, Summer, Fall

RESM 6340 Qualitative Research II: Design And Analysis
[3 credit hours]
This course takes student through the design, implementation, and write up a qualitative study. Topics include theoretical frameworks and research design; managing, analyzing and interpreting data; collaboration between researcher and researched; using computers in analysis.
Prerequisites: RESM 5330 with a minimum grade of C or RESM 7330 with a minimum grade of C
Term Offered: Spring

RESM 6360 Program Evaluation
[3 credit hours]
An overview of prominent human services program evaluation methods including objectives-based, experimental, statistical and economic approaches. Evaluation criteria, issues, ethics and politics are considered.
Prerequisites: RESM 5110 with a minimum grade of C or RESM 7110 with a minimum grade of C
Term Offered: Spring, Summer, Fall

RESM 6370 Fundamentals Of Grant Writing
[3 credit hours]
This seminar teaches participants about fundamentals of grant writing. Topics covered include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.
Term Offered: Spring, Summer

RESM 6550 Statistical Analysis by Computer
[3 credit hours]
Course covers computer applications (SPSS, Excel) of statistical analyses. Statistical tests covered include descriptive, nonparametric, tests of mean differences, tests of association, and scaling techniques. Successful students generally will have completed a basic statistics class.
Prerequisites: RESM 5110 with a minimum grade of C and RESM 7110 with a minimum grade of C
Term Offered: Spring, Fall

RESM 6900 Research and Measurement Master's Portfolio
[1 credit hour]
This course is a one of the program completion options available for the Research and Measurement master's degree. This course is intended to be longitudinal with one credit hour completed each semester of the three-semester (full-time study) master's program. Upon program completion, portfolio contents should reflect samples of best works completed in each of the 9 courses comprising the master's core, the research and measurement core, and research and measurement concentration.
Term Offered: Spring, Summer, Fall

RESM 6960 Master's Thesis In Educational Research
[1-3 credit hours]
This option is open to a graduate student who elects the completion of a research thesis in fulfilling the research requirement of the master's degree.
Term Offered: Spring, Summer, Fall

RESM 6990 Master's Independent Study In Educational Research
[1-3 credit hours]
This is a formal exploration of a current topic in educational research, measurement, statistics, or program evaluation. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Summer

RESM 7110 Quantitative Methods I
[3 credit hours]
This course introduces the major concepts of statistical description, including central tendency, dispersion, and relative position and relationship. Inferential methods such as t-tests, one-way analysis of variance, and multiple group analyses are also presented.
Term Offered: Spring, Summer, Fall

RESM 7210 Educational Testing And Grading
[3 credit hours]
This course introduces the development, administration and interpretation of teacher-made tests and other pupil assessments; basic principles underlying norm- and criterion-referenced tests; problems and issues in grading systems and assigning grades; standardized testing and Value-Added Models.
Term Offered: Spring, Summer, Fall

RESM 7220 Applied Assessment for Improved Practice
[3 credit hours]
This is an advanced course in classroom assessment with a focus on informed and applied evidence-based decision making. Key components are the analysis and reporting of results from assessment datasets, the creation of formative and summative assessment action plans based on analysis results, and the incorporation of 21st century technology tools to support assessment planning and instructional decisions.
Prerequisites: RESM 4200 with a minimum grade of D- or RESM 5210 with a minimum grade of C or RESM 7210 with a minimum grade of C
Term Offered: Summer

RESM 7310 Understanding and Consuming Research
[3 credit hours]
This course offers an introduction to the history and foundations of research processes from the consumer's perspective. It introduces qualitative, quantitative, and mixed methods approaches for understanding research problems.
Term Offered: Spring, Summer, Fall

RESM 7330 Qualitative Research I: Introduction And Basic Methods
[3 credit hours]
This course introduces history and theoretical underpinnings of qualitative research. Students then learn and practice fundamental methods of participant-observation, fieldnotes, interviewing, and transcription, and explore common models of qualitative research.
Term Offered: Summer, Fall

RESM 7550 Introduction to Research and Measurement (RESM) and Graduate Studies
[3 credit hours]
This course offers an introduction to the foundations of the research process and an exploration of the major program strands (research and evaluation design, data analysis and interpretation, development and validation of measures, and school-based classroom and program assessment). It also focuses on practical strategies and skills that promote successful graduate-level study.
Term Offered: Spring, Fall

RESM 7950 Workshop In Research And Measurement
[3 credit hours]
Each workshop is developed around a topic of interest and concern to inservice teachers and other educational personnel. Practical application of workshop topics will be emphasized.
Prerequisites: RESM 4100 with a minimum grade of D- or RESM 5110 with a minimum grade of C
Term Offered: Spring, Summer

RESM 8120 Quantitative Methods II
[3 credit hours]
This course covers the major inferential statistical techniques common to the behavioral sciences. Correlation, factorial analysis of variance, and linear regression are major topics. Computer applications are included.
Prerequisites: RESM 4100 with a minimum grade of D- or RESM 5110 with a minimum grade of C
Term Offered: Spring, Summer, Fall

RESM 8130 Multivariate Statistics
[3 credit hours]
This course covers multivariate analysis of variance, canonical correlation, discriminant analysis, repeated measures and factor analysis. Computer applications are included.
Prerequisites: RESM 6120 with a minimum grade of C or RESM 8120 with a minimum grade of C
Term Offered: Spring, Fall

RESM 8160 Nonparametric Statistics
[3 credit hours]
This course introduces the most common nonparametric statistical techniques as well as recent developments in this field. Coverage includes contingency tables, binomial distribution tests, several rank tests and other distribution-free statistics.
Prerequisites: RESM 4100 with a minimum grade of D- or RESM 5110 with a minimum grade of C
Term Offered: Spring, Fall

RESM 8220 Measurement I
[3 credit hours]
This course introduces psychometric theories, with emphasis on classical test theory; reliability theory, including generalizability theory; approaches to validation; practical applications such as standard setting.
Prerequisites: RESM 4100 with a minimum grade of D- or RESM 5110 with a minimum grade of C
Term Offered: Spring, Fall

RESM 8230 Applied Measurement Research
[3 credit hours]
Applied practical experience in measurement analyses is emphasized and participants are introduced to a series of advanced measurement and research-related processes in this authentic experiential course.
Prerequisites: (RESM 6220 with a minimum grade of C or RESM 8220 with a minimum grade of C) and RESM 5110 with a minimum grade of C
Term Offered: Spring

RESM 8240 Mixed Methods Research: Theory & Application
[3 credit hours]
This course introduces history and theoretical foundations of mixed methods research. Students learn the foundations and theories of mixed methods research and practice. Students will also have the practical experience of implementing mixed methods research in their field of interest from problem identification through to research design, analysis, and reporting.
Term Offered: Spring, Fall

RESM 8320 Research Design
[3 credit hours]
This course exposes students to quantitative and mixed method research approaches that are used in theses and dissertations. Competing designs for addressing research questions are compared. The purpose is to prepare students for their dissertation experience.
Prerequisites: RESM 4100 with a minimum grade of D- or RESM 5110 with a minimum grade of C
Term Offered: Spring, Summer, Fall

RESM 8340 Qualitative Research II: Design And Analysis
[3 credit hours]
This course takes student through the design, implementation, and write up a qualitative study. Topics include theoretical frameworks and research design; managing, analyzing and interpreting data; collaboration between researcher and researched; using computers in analysis.
Prerequisites: RESM 5330 with a minimum grade of C or RESM 7330 with a minimum grade of C
Term Offered: Spring, Fall

RESM 8360 Program Evaluation
[3 credit hours]
An overview of prominent human services program evaluation methods including objectives-based, experimental, statistical and economic approaches. Evaluation criteria, issues, ethics and politics are considered.
Prerequisites: RESM 5110 with a minimum grade of C or RESM 7110 with a minimum grade of C
Term Offered: Spring, Summer, Fall

RESM 8370 Fundamentals Of Grant Writing
[3 credit hours]
This seminar teaches participants about fundamentals of grant writing. Topics covered include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.
Term Offered: Spring, Summer

RESM 8380 Methods of Normative Theory Construction
[3 credit hours]
This course explores prominent methods and approaches to normative theory construction. The two approaches covered deontological and teleological.
Term Offered: Spring, Fall

RESM 8550 Statistical Analysis by Computer
[3 credit hours]
Course covers computer applications (SPSS, Excel) of statistical analyses. Statistical tests covered include descriptive, nonparametric, tests of mean differences, tests of association, and scaling techniques. Successful students generally will have completed a basic statistics class.
Prerequisites: RESM 5110 with a minimum grade of C and RESM 7110 with a minimum grade of C
Term Offered: Spring, Fall

RESM 8940 Internships In Measurement, Evaluation, Research & Statistics
[3 credit hours]
This is a supervised field experience in measurement, evaluation, research design, or statistics in a variety of settings.
Term Offered: Spring, Summer, Fall

RESM 8960 Dissertation Research In Foundations Of Education
[1-12 credit hours]
This is a formal independent study culminating in a written discourse central to the advancement of knowledge in educational research design, statistics, measurement, or evaluation.
Term Offered: Spring, Summer, Fall

RESM 8990 Doctoral-Independent Study
[1-6 credit hours]
This is a formal exploration of a current topic in educational research, measurement, statistics, or program evaluation. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Summer, Fall

School Psychology (SPSY)

SPSY 5030 Role And Function Of The School Psychologist
[3 credit hours]
Designed for school psychology students to develop an understanding of the school psychologist as a member of the school staff. It also serves as an introduction to each of the important concepts in current practice, as well as the values of our specific program. Current legal & ethical responsibilities, the history of the profession, as well as current theories of service delivery will be explored.
Term Offered: Fall

SPSY 5040 Legal And Ethical Issues For School Psychologists And Counselors
[4 credit hours]
Covers the ethical standards and legal regulation in school psychology and school counseling. Ethical standards, litigation and legal regulation are examined in regard to professional practice.
Term Offered: Spring, Summer, Fall

SPSY 5060 Prepractica in School Psychology
[2 credit hours]
A two-semester pre-internship experience designed for first year school psychology graduate students to acquire knowledge of schools as systems and to gain familiarity with the role and function of the school psychologist and other related services staff. This course includes activities designed to build students' skills in delivering culturally responsive practices.
Term Offered: Spring, Fall

SPSY 5170 Consultation I: Theories And Techniques
[3 credit hours]
Designed to provide an overview of the major consultation theories and techniques and to help students develop consultation skills, which may be applied in the schools, community agencies, or other settings. Includes introduction to and practice in applying the problem solving process to school-based academic and behavior problems.
Term Offered: Spring, Summer, Fall

SPSY 5300 Psychoeducational Assessment And Interventions I
[4 credit hours]
Introduction to academic achievement and instruction and assessment methods including curriculum-based assessment. Instruction in linking assessment to evidence-based instruction and intervention, intervention strategies to improve academic outcomes.
Term Offered: Fall

SPSY 5310 Psychoeducational Assessment And Interventions II
[4 credit hours]
Introduction to standardized, norm-referenced measurement of student learning. Instruction in integrating multiple assessments to make data-based decisions and recommendations. Introduces special education assessment and report writing for students with specific learning disabilities.
Prerequisites: SPSY 5300 (may be taken concurrently) with a minimum grade of B
Term Offered: Spring

SPSY 5320 Psychoeducational Assessment And Interventions III
[4 credit hours]
Provides advanced instruction in direct and indirect assessment methods and evidence-based interventions. Instruction in comprehensive report writing linked to data-based recommendations for student behavior, social-emotional, and mental health needs.
Prerequisites: SPSY 7310 with a minimum grade of B or SPSY 5310 with a minimum grade of B
Term Offered: Spring, Summer, Fall

SPSY 5980 Special Topics In Counseling, Mental Health, And School Psychology
[1-3 credit hours]
This course is open to a graduate student pursuing a master's, specialist or doctoral degree program and may be a requirement of that program.
Term Offered: Spring, Summer

SPSY 6260 Developmental Child Psychopathology
[4 credit hours]
This course covers the influence of nature (e.g., prenatal, biological, genetic) and nurture (family, culture, and community) on typical and atypical child development. It emphasizes the development of disorders of infancy through adolescents from an ecological perspective, focusing on understanding characteristics and causes, diagnosis both medical and educational, and identifications of interventions for school and home.
Term Offered: Spring, Summer, Fall

SPSY 6300 Behavior Analysis for School Psychologists
[3 credit hours]
Course provides an in-depth introduction to concepts and principles of behavior analysis as the basis for understanding academic and behavior problems in applied settings and in the development and implementation of behavioral assessments and applied across tiers of intervention.
Term Offered: Fall

SPSY 6990 Master's Independent Study
[1-4 credit hours]
Provides students the opportunity to work independently on professional problems under the direction of a faculty member in the School Psychology Program.
Term Offered: Spring, Summer

SPSY 7170 Consultation I: Theories And Techniques
[3 credit hours]
Designed to provide an overview of the major consultation theories and techniques and to help students develop consultation skills, which may be applied in the schools, community agencies, or other settings. Includes introduction to and practice in applying the problem solving process to school-based academic and behavior problems.
Term Offered: Spring, Summer, Fall

SPSY 7180 Consultation II: School and Home Collaboration
[3 credit hours]
Provides training in universal/system-level academic interventions with an emphasis on consultation practices used to develop and sustain home and school collaboration. Includes study and review of prevention programs for student academic success and system-level academic assessment methods.
Term Offered: Spring, Summer, Fall

SPSY 7190 Consultation III:School and Community
[4 credit hours]
Provides training in universal/system-level behavior interventions with an emphasis on practices used to develop and sustain school and community collaboration. Includes instruction in system change theory, prevention programs for promoting mental health, and crisis prevention and intervention.
Term Offered: Spring, Summer, Fall

SPSY 7260 Developmental Child Psychopathology
[4 credit hours]
This course covers the influence of nature (e.g., prenatal, biological, genetic) and nurture (family, culture, and community) on typical and atypical child development. It emphasizes the development of disorders of infancy through adolescents from an ecological perspective, focusing on understanding characteristics and causes, diagnosis both medical and educational, and identifications of interventions for school and home.
Term Offered: Spring, Summer, Fall

SPSY 7310 Psychoeducational Assessment And Interventions II
[4 credit hours]
Introduction to standardized, norm-referenced measurement of student learning. Instruction in integrating multiple assessments to make data-based decisions and recommendations. Introduces special education assessment and report writing for students with specific learning disabilities.
Prerequisites: SPSY 5300 (may be taken concurrently) with a minimum grade of B
Term Offered: Spring

SPSY 7320 Psychoeducational Assessment And Interventions III
[4 credit hours]
Provides advanced instruction in direct and indirect assessment methods and evidence-based interventions. Instruction in comprehensive report writing linked to data-based recommendations for student behavior, social-emotional, and mental health needs.
Prerequisites: SPSY 7310 with a minimum grade of B or SPSY 5310 with a minimum grade of B
Term Offered: Spring, Summer, Fall

SPSY 7330 Practica in School Psychology
[1-4 credit hours]
A two semester pre-internship experience designed for second year school psychology students. Provides experience in tiered intervention design, implementation, and evaluation for behavior and academic problems. Includes practice in individual assessment for special education eligibility.
Term Offered: Spring, Summer, Fall

SPSY 7350 Psychoeducational Assessment and Interventions IV
[4 credit hours]
Provides advanced training in special education assessment and intervention to support student learning, socialization, and to enhance mental and behavioral health. Direct instruction in cognitive assessment and advanced report writing.
Prerequisites: SPSY 5310 with a minimum grade of B or SPSY 7310 with a minimum grade of B
Term Offered: Spring, Fall

SPSY 7940 Internship In School Psychology
[1-8 credit hours]
Academic year on-the-job internship experience for third year school psychology students. Conducted in a school and supervised by a school psychologist and coordinated by a university supervisor. Prepares students for the broad range of services to include tiered mental health and instructional interventions, assessment linked to intervention, consultation, special education assessment, home-school-community collaboration, and counseling.
Prerequisites: SPSY 7330 with a minimum grade of C
Term Offered: Spring, Summer, Fall

SPSY 8300 Behavior Analysis for School Psychologists
[3 credit hours]
Course provides an in-depth introduction to concepts and principles of behavior analysis as the basis for understanding academic and behavior problems in applied settings and in the development and implementation of behavioral assessments and applied across tiers of intervention.
Term Offered: Fall

SPSY 8980 Special Topics In Counseling, Mental Health, And School Psychology
[1-3 credit hours]
This course is open to a graduate student pursuing a master's, specialist or doctoral degree program and may be a requirement of that program.
Term Offered: Spring, Fall

SPSY 8990 Doctoral Independent Study
[1-4 credit hours]
Provides students the opportunity to work independently on professional problems under the direction of a faculty member in the Department of Counseling and Mental Health Services.

Social Work (SOCW)

SOCW 5010 Social Work Research Methods And Analysis
[3 credit hours]
Course introduces students to qualitative and quantitative research methodologies, supporting statistical methods as utilized within the social work profession, data analysis technology and evidence-based social work practice concepts.
Term Offered: Fall

SOCW 5110 Social Work Practice I
[3 credit hours]
Provides an overview of social work practice theory and paradigms to base practice with individuals, families and groups emphasizing strengths and empowerment, values and ethics, and understanding self.
Term Offered: Fall

SOCW 5120 Social Work Practice II
[3 credit hours]
Provides an overview of social work theories guiding social work practice with groups and organizations, including group development, leadership, and models of organizations within a social and economic justice framework.
Prerequisites: SOCW 5110 with a minimum grade of C and SOCW 5210 with a minimum grade of C
Term Offered: Spring

SOCW 5130 Social Work Practice III
[3 credit hours]
Provides historical and contemporary look at the social work profession, its roots in community organizing, theories underpinning group work and community organizing. Strengths and empowerment models and social justice emphasized.
Prerequisites: SOCW 5110 with a minimum grade of C
Term Offered: Spring

SOCW 5210 Micro Social Work Perspectives In Human Behavior And The Social Environment
[3 credit hours]
Course is organized on a developmental model including social work perpectives and theory on: biopsychosocial aspects of human growth and development. Critical analysis encouraged through social justice conceptualizations.
Term Offered: Fall

SOCW 5220 Macro Social Work Perspectives In Human Behavior And The Social Environment
[3 credit hours]
Course views the behavior of groups, organizations, and communities and their environmental contexts through a social work perspective. Attention focuses on issues of diversity, oppression, and social and economic justice.
Prerequisites: SOCW 5210 with a minimum grade of C
Term Offered: Spring

SOCW 5330 Policy Issues And Analysis In Social Work
[3 credit hours]
Course covers the history of social work profession and major institutions. Through current policy issues, methods of policy analysis are provided. Students are introduced to various methods of policy practice.
Term Offered: Fall

SOCW 5900 Foundation Field Experience and Integrative Seminar I
[3 credit hours]
Students participate in a weekly seminar to integrate classroom learning to the field experience; and during the 3rd week begin a 208 hour field experience in an assigned agency. The course must be taken in consecutive semesters with SOCW 5910.
Prerequisites: SOCW 5010 (may be taken concurrently) with a minimum grade of C and SOCW 5330 (may be taken concurrently) with a minimum grade of C and SOCW 5110 (may be taken concurrently) with a minimum grade of C and SOCW 5210 (may be taken concurrently) with a minimum grade of C
Term Offered: Fall

SOCW 5910 Foundation Field Experience and Integrative Seminar II
[3 credit hours]
Students continue in the field agency assigned in SOCW 5900; complete 217 field hours; and participate in the same weekly integrative field seminar section. SOCW 5900 and 5910 must be taken in consecutive semesters.
Prerequisites: SOCW 5900 (may be taken concurrently) with a minimum grade of C and SOCW 5120 (may be taken concurrently) with a minimum grade of C and SOCW 5220 (may be taken concurrently) with a minimum grade of C and SOCW 5130 (may be taken concurrently) with a minimum grade of C
Term Offered: Spring

SOCW 6030 Research Methods For Macro Social Work Practice
[3 credit hours]
Covers research methods specific to macro social work practice especially needs assessment and program evaluation. Content on research ethics, data management, and evidence based practice are addressed. Prerequisites: All 5000 level courses, advanced standing status or permission of instructor.
Term Offered: Fall

SOCW 6040 Research Methods For Micro Social Work Practice
[3 credit hours]
Course covers evaluation of client accomplishments through subject design methods. Content on research Ethics, data management, and evidence based practice are addressed. Prerequisites: all 5000-level courses, advanced standing status or by permission of instructor.
Term Offered: Fall

SOCW 6110 Advanced Generalist Practice I
[3 credit hours]
Advanced study of generalist social work practice and theory when working with individuals, families, and groups with an intergenerational focus on social and economic justice. All SOCW 5000-level courses, Advanced Standing Status, or Permission.
Term Offered: Summer, Fall

SOCW 6120 Advanced Generalist Practice II
[3 credit hours]
Course provides advanced content on social work practice in organizations including financial management, supervision and planning. Incorporates current theoretical perspectives and research on effective practice. Prerequisite: SOCW 6110 with a B or better, or permission of instructor.
Prerequisites: SOCW 6110 with a minimum grade of C
Term Offered: Spring

SOCW 6130 Advanced Generalist Practice III
[3 credit hours]
Course provides advanced content on social work practice within the community and with groups. Particular attention is paid to community change processes and social and economic justice. Prerequisite: SOCW 6110 and 6140 with a B or better.
Prerequisites: SOCW 6110 with a minimum grade of C
Term Offered: Spring

SOCW 6140 Advanced Social Work Assessment
[3 credit hours]
Course provides an overview of theories and methods of social work assessment with an emphasis on psychosocial assessment, macro assessments and various tools used by social workers for asssessment purposes. Prerequisites all 5000 level corses, advaced standing status. or by permission.
Term Offered: Spring, Summer, Fall

SOCW 6200 Disparities, Diversity and Social Justice
[2 credit hours]
This graduate social work course provides students with an understanding of the impact of social inequalities when working within diverse systems. Using self-reflection and critical analysis, students will build cultural and linguistic competence. This course examines the mechanisms of privilege and oppression that impact the experiences of diverse populations, using theories of critical multiculturalism and intersectionality. This course will enhance students' knowledge, values, and attitudes about social work practice at micro, mezzo, and macro levels.
Term Offered: Spring, Summer, Fall

SOCW 6410 Social Work Micro Practice with Children and Families
[3 credit hours]
Course provides students with specialized knowledge about clinical practice with children and families. Included are major theoretical perspectives and practices currently accepted in the field, with an emphasis on strengths and empowerment.
Term Offered: Fall

SOCW 6430 Social Work Macro Practice involving Children and Families
[3 credit hours]
This is the second of two Child and Family specialization courses. It provides knowledge about current social work issues and practices in the mezzo and macro practice arenas, including social work practice related to laws, regulations, and policies concerning services for children and families.
Prerequisites: SOCW 6410 with a minimum grade of C
Term Offered: Spring

SOCW 6510 Social Work Micro Practice in Mental Health
[3 credit hours]
This course Provides MSW students with specialized knowledge about clinical practice in mental-behavioral health settings. The focus includes social works history of involvement with the primary prevention, diagnosis and treatment of mental and emotional disorders. Major emphasis is placed on social work practice at these levels with emphasis on social and economic justice.
Prerequisites: SOCW 6140 with a minimum grade of C
Term Offered: Fall

SOCW 6530 Social Work Macro Practice in Mental Health
[3 credit hours]
This is the second of two mental health specialization courses. It provides knowledge about current social work issues in the mezzo-macro practice arena, including social work practice related to laws regulations and policies concerning mental health services. Major emphasis is placed on social work practice at these levels with emphasis on social and economic justice.
Prerequisites: SOCW 6510 with a minimum grade of C
Term Offered: Spring

SOCW 6900 ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR I
[5 credit hours]
Students are assigned to a field agency; complete 360 field hours; and attend a weekly seminar to integrate classroom learning to the field experience. SOCW 6900 and SOCW 6910 must be taken in consecutive semesters.
Prerequisites: SOCW 6460 with a minimum grade of B and SOCW 6410 (may be taken concurrently) with a minimum grade of B or SOCW 6510 (may be taken concurrently) with a minimum grade of B and SOCW 6560 with a minimum grade of B
Term Offered: Fall

SOCW 6910 ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR II
[5 credit hours]
Students continue placement in the field agency assigned in SOCW 6900; complete 360 field hoursl and participate in same weekly integrative field seminar section. SOCW 6900 and 6910 must be taken in consecutive semesters.
Prerequisites: SOCW 6900 with a minimum grade of B and SOCW 6430 (may be taken concurrently) with a minimum grade of B or SOCW 6530 (may be taken concurrently) with a minimum grade of B
Term Offered: Spring

SOCW 6980 Special Topics In Social Work
[1-3 credit hours]
Content will vary as instructors present a single concentration on developments, problems, and controversies in social work.
Term Offered: Spring, Summer, Fall

SOCW 6990 Independent Study In Social Work
[1-3 credit hours]
Directed study in social work under the supervision of a social work faculty member.
Term Offered: Spring, Summer, Fall

Sociology (SOC)

SOC 5040 Classical Theory
[3 credit hours]
19th Century theory in sociology with emphasis on A. Comte, K. Marx, E. Durkheim, T. Veblen, M. Weber and H. Spencer.
Term Offered: Spring, Fall

SOC 5100 Community Organizing And Development
[3 credit hours]
This course will review the major forms of community and organizing since World War II. Practical issues and theoretical issues will be stressed. Students will engage in intensive case study research applying the course concepts in addition to reading and writing on the various topics.

SOC 5160 Health And Gender
[3 credit hours]
An examination of gender as a predisposing factor of health status, health behavior, health care delivery, and the structure and posture of health care professionals.
Term Offered: Spring, Summer, Fall

SOC 5180 Medical Sociology
[3 credit hours]
An analysis of the sociocultural factors in health and illness, and in medical and paramedical services, and in the field of health practice as a social institution.
Term Offered: Spring, Fall

SOC 5270 Social Research Methods
[3 credit hours]
Introduction to procedures used in the various phases of sociological research.
Term Offered: Spring, Fall

SOC 5290 Social Research Statistics
[3 credit hours]
Study of major statistical procedures and techniques in sociology.
Term Offered: Spring, Fall

SOC 5340 Population And Society
[3 credit hours]
Examination of the interaction among variables of population (fertility, mortality and migration) and other aspects of societal organization.
Term Offered: Fall

SOC 5440 People, Population, and Society: Demographic Analysis
[3 credit hours]
Methods of population analysis, including examination and evaluation of data sources.
Term Offered: Spring, Summer

SOC 5450 Exploring the City
[3 credit hours]
This course takes an interdisciplinary approach to life in cities around the world, with emphasis on the ethnographic exploration of how power, cultural difference, and social inequality in cities are produced and experienced.
Term Offered: Spring, Fall

SOC 5530 Qualitative Approaches in Social Science Research
[3 credit hours]
This course examines qualitative methods used in social science research. Focusing on ethnographic and qualitative methods, the course provides students the skills necessary to design and conduct qualitative research studies.
Term Offered: Spring, Fall

SOC 5560 Fieldwork in Sociology
[6 credit hours]
This course involves the student in meaningful social research at the community level. The student is introduced to methods in fieldwork in the social sciences.
Term Offered: Spring, Summer, Fall

SOC 5710 Criminology
[3 credit hours]
Crime and criminal behavior: nature, types and extent of crime, societal reactions; problems in research and theory, prevention, control and treatment.
Term Offered: Summer

SOC 5720 Deviant Behavior
[3 credit hours]
Study of the analysis of the nature, meaning and process of deviant behavior in terms of social norms, control and societal reaction.
Term Offered: Spring, Summer, Fall

SOC 5760 Juvenile Delinquency
[3 credit hours]
Delinquency and delinquent behavior, including definitions, extent, process, types and causes; methods of prevention, protective control and treatment; institutional and non-institutional facilities and services.

SOC 5810 Gender In Cross-Cultural Perspective
[3 credit hours]
Analysis of gender stratification and its impact on culture in various nations and across ethnic groups in the United States.

SOC 5830 Social Movements
[3 credit hours]
This course analyzes how and why social protest movements form, and how and why they succeed or fail. Attention will be given to post-World War II social movements, including current examples.
Term Offered: Spring, Fall

SOC 5840 Globalization
[3 credit hours]
This course starts by looking at the historical context of globalization, showing this process is not necessarily something new. From there it focuses on three dimensions of globalization: economic, political, and cultural - stressing the interconnectedness of these issues. This course is not an exhaustive survey of all facets of globalization, but it does at least touch upon many of the major issues related to this phenomenon.
Term Offered: Spring

SOC 5850 Public and Applied Sociology
[3 credit hours]
This course introduces students to how sociological research can be made accessible to communities, organizations, and broad audiences. Students learn how they can use sociological skills and insights to improve social conditions and contribute to the betterment of society.
Term Offered: Spring, Summer, Fall

SOC 5980 Special Topics In Sociology
[3 credit hours]
Sociological examination of a developing social issue. May be repeated in different specialized topics.
Term Offered: Spring, Summer, Fall

SOC 5990 Directed Readings In Sociology
[1-3 credit hours]
Written proposal required. May be repeated for additional credit. For majors wishing to continue course work in greater depth or seeking contact with unlisted subject areas.
Term Offered: Spring, Summer

SOC 6000 Introduction To Graduate Studies In Sociology
[0 credit hours]
Graduate students are exposed to and get acquainted with the academic and professional nature of the field of sociology from the experience of several faculty members. Some of the topics that will be covered include writing theses, doing internships and seeking graduate work and careers.
Term Offered: Spring, Fall

SOC 6050 Advanced Social Theory And Political Economy
[3 credit hours]
This course will analyze and evaluate major social theories drawn from various 19th and 20th century intellectual and ideological traditions. The common subject focus of course readings is state, power and class relations.
Prerequisites: SOC 4040 with a minimum grade of D- or SOC 5040 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

SOC 6270 Advanced Social Research Methods
[3 credit hours]
Examination of advanced methods of data collection in sociological research.
Prerequisites: SOC 5270 with a minimum grade of D-
Term Offered: Spring, Fall

SOC 6290 Advanced Social Research Statistics
[3 credit hours]
Examination of advanced methods of data analysis in sociological research.
Prerequisites: SOC 5290 with a minimum grade of D-
Term Offered: Spring, Fall

SOC 6640 Seminar in Diversity and Inequality
[3 credit hours]
This course examines theories and research on diversity and inequality. Possible topics include social class, race, gender, sexual orientation and disability, plus evaluating the interconnections between these areas.

SOC 6900 Independent Research In Sociology
[1-3 credit hours]
Student-selected research topic under the supervision of a sociology faculty member. Permission to enroll is contingent on the instructor's acceptance of the student's research proposal.
Term Offered: Spring, Summer, Fall

SOC 6930 Seminars In Sociology
[3 credit hours]
Seminar on selected topics in the field of Sociology.
Term Offered: Spring, Fall

SOC 6940 Graduate Internship
[0-9 credit hours]
In applied setting in areas of student interest: community organizing - health-probation - gerontology.
Prerequisites: (SOC 6040 with a minimum grade of C or SOC 6050 with a minimum grade of C) and SOC 6270 with a minimum grade of C and SOC 6290 with a minimum grade of C
Term Offered: Spring, Summer, Fall

SOC 6960 Thesis
[1-6 credit hours]
Topic (proposal) is selected by the student and approved by a thesis committee.
Prerequisites: (SOC 6270 with a minimum grade of C and SOC 6290 with a minimum grade of C and SOC 6040 with a minimum grade of C or SOC 6050 with a minimum grade of C)
Term Offered: Spring, Summer, Fall

SOC 6970 Master of Sociology Project
[1-6 credit hours]
Applied capstone project supervised by faculty advisor and committee that integrates the knowledge and skills in the program.
Term Offered: Spring, Summer, Fall

SOC 6990 Independent Study In Sociology
[1-3 credit hours]
Written proposal required. May be repeated for additional credit. For majors wishing to continue course work in greater depth or seeking contact with unlisted subject areas.
Term Offered: Spring, Summer, Fall

Spanish (SPAN)

SPAN 5000 Advanced Spanish Grammar
[3 credit hours]
An advanced study of Spanish grammar in preparation for higher levels of study in the language and for its use in professional pursuits.
Term Offered: Spring, Fall

SPAN 5010 Syntax And Stylistics
[4 credit hours]
A thorough study of the grammatical structure of Spanish with special attention to stylistic problems.
Term Offered: Spring, Fall

SPAN 5060 Translation & Interpretation In Spanish
[3 credit hours]
A study of the techniques of translation and interpretation as they relate to English and Spanish based on a contrastive analysis of two languages, both in theory and practice.
Term Offered: Spring

SPAN 5070 History Of The Spanish Language
[3 credit hours]
A study of the development of the Spanish language from Vulgar Latin to the present, illustrated with selected texts.
Term Offered: Spring

SPAN 5110 Introduction To Spanish Linguistics
[4 credit hours]
Basic concepts of linguistics as applied to the study of the Spanish language and its dialectal systems. Emphasis phonetics, phonology, morphology, syntax and semantics.
Term Offered: Spring, Fall

SPAN 5120 Teaching Colloquia
[3 credit hours]
A course in the theory of second language acquisition and practice of teaching foreign / second languages in general.
Term Offered: Spring, Summer, Fall

SPAN 5180 Business Spanish
[3 credit hours]
A graduate level introduction to the language of the Hispanic world peculiar to the areas of business and commerce.
Term Offered: Fall

SPAN 5210 Spanish For Reading Knowledge I
[3 credit hours]
Study of those elements of structure and vocabulary most appropriate for preparing graduate students to read effectively in Spanish. (Not for majors)
Term Offered: Spring, Fall

SPAN 5250 Latin American Short Story
[3 credit hours]
Development of the Latin American short story from its origins with special emphasis on the contemporary authors such as Allende, Borges, Cortazar, Garcia Marquez and Rulfo among others.
Term Offered: Fall

SPAN 5820 Modern Spanish Drama
[3 credit hours]
Critical readings of Spanish drama from Romanticism to the latest contemporary trends.

SPAN 5830 Hispanic Cinema
[3 credit hours]
Critical viewings of Spanish-language films from Spain and the Americas. Emphasis on cultural criticism.
Term Offered: Spring, Fall

SPAN 5980 Special Topics
[3 credit hours]
Study and research in specific areas or authors with considerable reading of Spanish texts plus written reports in Spanish.
Term Offered: Spring, Fall

SPAN 6900 Research In Spanish
[1-3 credit hours]
May be repeated for additional credit when topic varies.
Term Offered: Spring, Summer, Fall

SPAN 6930 Seminar: Selected Topics
[1-3 credit hours]
Selected topics from Spanish culture, linguistics, or literature.
Term Offered: Spring, Fall

Spatially Integrated Social Sciences (SISS)

SISS 7010 Spatial Statistics
[3 credit hours]
The course deals with statistical theory and applied statistical techniques for spatial data analysis. Topics include descriptive statistics, statistical modeling and hypothesis testing for spatial dependence and spatial heterogeneity.
Term Offered: Spring, Fall

SISS 7020 GEOGRAPHICAL INFORMATION SCIENCE IN SISS
[3 credit hours]
The course emphasizes the fundamental elements of cartography, geodesy, statistics, mathematics and geo-computational methods that form the foundation for the development of GIS and spatial analysis tools.
Term Offered: Fall

SISS 8010 FOUNDATIONS OF SPATIALLY INTEGRATED SOCIAL SCIENCE
[3 credit hours]
This course will examine the historical development of the social sciences, their philosophical and methodological approaches to research, and the emergence of the spatial perspective in social science research.
Term Offered: Fall

SISS 8020 SISS THEORY
[3 credit hours]
Advanced study of SISS requiring preparedness in theoretical and methodological aspects of spatial analysis in social sciences focusing on the spatial organization of society and spatial human and social dynamics.
Prerequisites: SISS 8010 with a minimum grade of D-
Term Offered: Spring

SISS 8030 ADVANCED SPATIAL DATA ANALYSIS
[3 credit hours]
Examination of spatial processes: spatial autoregressive models, gaussian Markov random ¿eld models, auto-logistic models, spatial discrete choice models. The topics include spatial panel data models, their applications and estimation methods.
Prerequisites: SISS 7010 with a minimum grade of D-
Term Offered: Spring

SISS 8040 Research Design
[3 credit hours]
Introduces students to research and research technicalities, including what is research, how to write research papers and research proposals, and how to design and manage a research project.
Prerequisites: SISS 8010 with a minimum grade of B- and SISS 8020 with a minimum grade of B-
Term Offered: Spring

SISS 8150 ADVANCED QUALITATIVE ANALYSIS IN SISS
[3 credit hours]
Advanced qualitative analysis techniques and applications to a broad range of spatially oriented social science problems.
Prerequisites: SISS 7010 with a minimum grade of D- and SISS 7020 with a minimum grade of D- and SISS 8010 with a minimum grade of D-

SISS 8170 SPACE AND SOCIETY CRITICAL THEORY IN SISS
[3 credit hours]
Critical examination of both the role of spatial inquiry and its limitations to the understanding of society and space.
Prerequisites: SISS 7010 with a minimum grade of D- and SISS 7020 with a minimum grade of D- and SISS 8010 with a minimum grade of D-
Term Offered: Spring

SISS 8200 SPATIAL PERSPECTIVES ON THE ENVIRONMENT
[3 credit hours]
Examination of the relationship between SISS approaches and human interaction with the natural environment.
Prerequisites: SISS 7010 with a minimum grade of D- and SISS 7020 with a minimum grade of D- and SISS 8010 with a minimum grade of D-
Term Offered: Spring, Fall

SISS 8920 Directed Readings in SISS
[3 credit hours]
Independent study of research literature in Spatially Integrated Social Science and related fields.
Prerequisites: SISS 7010 with a minimum grade of D- and SISS 7020 with a minimum grade of D- and SISS 8010 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

SISS 8940 Seminar in Special Topics
[3 credit hours]
Discussion of the major advances in Spatially Integrated Social Science as presented in the primary research in a selected topic or set of topics.
Prerequisites: SISS 7010 with a minimum grade of D- and SISS 7020 with a minimum grade of D- and SISS 8010 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

SISS 8960 Doctoral Dissertation Research
[1-12 credit hours]
Original research on a comprehensive topic of a spatial nature in the social sciences under the direction of a SISS faculty member. 18 credits in SISS core with grades of B or higher; 9 credits in advanced SISS seminars and 9 credits in SISS electives, all with grades of B or higher. Must pass dissertation qualifying exam within first semester of dissertation.
Term Offered: Spring, Summer, Fall

SISS 8980 Internship in SISS
[1-3 credit hours]
Professional internship opportunity for students in the SISS PhD program that will provide career related experiences intended to enhance student learning as related to knowledge and skills obtained connected to the program requirements and learning outcomes.
Term Offered: Spring, Summer, Fall

Special Education (SPED)

SPED 5000 Issues In Special Education
[3 credit hours]
Examination of causes and characteristics, identification procedures, and potential of learners who significantly deviate from the norm mentally, physically and behaviorally. Issues related to services for persons with disabilities will be studied.
Term Offered: Spring, Summer, Fall

SPED 5010 Atypical Development In Early Childhood: Implications For Development
[3 credit hours]
Factors that contribute to atypical development in early childhood, appropriate intervention models and implications of delay on young children's development. The focus will be on conditions that may result in eligibility of children for early intervention and/or special education services in infancy (0-2), in the preschool (3-5) and primary grade (K-3) years (ages 5 to 8).
Term Offered: Summer, Fall

SPED 5080 Curriculum Adaptations & Strategies In Early Childhood Education
[3 credit hours]
Curriculum models and intervention strategies which facilitate the cognitive, academic, social, language, self-help and lay skills of children with disabilities in preschool and primary grades will be examined.
Prerequisites: Upper Division with a score of 1
Term Offered: Spring, Fall

SPED 5150 Advanced Practicum For Teaching Students With Moderate Educational Needs
[1 credit hour]
This course is taken with SPED 5160 to apply strategies and techniques for teaching students with moderate educational needs. Forty hours of required field.
Corequisites: SPED 5160
Term Offered: Spring, Fall

SPED 5160 Advanced Instructional Methods For Teaching Students With Moderate Educational Needs
[3 credit hours]
This course focuses on a community-referenced functional curricula approach to teaching children and youths with moderate to severe delays. An in-depth study of inclusionary activities, community-based instruction, social skills.

SPED 5170 Partnerships in Transition Planning
[3 credit hours]
An in-depth study of strategies for linking young adults with disabilities to avenues leading to productive and fulfilling employment. Supported/customized employment and the development of successful business partnerships to create jobs and careers for young adults with disabilities will be addressed. This course requires 20 hours of field experience.
Term Offered: Fall

SPED 5180 Advanced Instructional Methods For Teaching Students With Intensive Educational Needs
[3 credit hours]
An in-depth examination of appropriate curriculum models, instructional strategies and adaptations, and related behavior problems for students with severe and multiple disabilities. A transdiciplinary team approach is explored.
Term Offered: Spring

SPED 5190 Practicum II - Intensive Needs
[1 credit hour]
This course is to apply strategies and techniques for teaching students with intensive needs.
Corequisites: SPED 5180
Term Offered: Spring

SPED 5210 Augmentative and Alternative Communication
[3 credit hours]
This course will provide an overview of alternative or augmentative modes of communication for children who are unable to meet their daily communication needs through natural modes such as speech, gestures or handwriting. It will provide a broad overview of AAC and its application, along with the history and terminology.
Term Offered: Fall

SPED 5250 Assessment and Planning in Transition Education and Services
[3 credit hours]
The course examines the planning and programming that supports young adults with disabilities during their transition from school to adult life. The course will cover several issues in the area of transition, including models of transition, planning, evidence-based instruction, assessment, transition planning, and progress monitoring. This course requires 20 hours of field experience.
Term Offered: Fall

SPED 5260 Family And Professional Relations In Special Education
[3 credit hours]
Effective parent and professional partnerships will be explored. Interpersonal communication skills, legal issues, effective models for home-school communication, and differences in culture, values and family expectations will be discussed.
Term Offered: Summer, Fall

SPED 5270 Team Models And Community Networking In Early Intervention
[3 credit hours]
This course will focus on the skills, knowledge and ethical practices essential to the provision of effective service coordination and teaming for early intervention and early childhood special education. In addition, students will examine various models of teaming and consultation approaches and address issues related to working with individuals from cultural backgrounds other than their own.
Term Offered: Spring, Fall

SPED 5280 Management Of The Learning Environment In Early Childhood Special Education
[3 credit hours]
This class will provide an analysis of the various aspects of quality environments, in the home and early childhood centers for young children with special needs. Identifying characteristics of natural environments and designing interventions that promote positive child outcomes will be emphasized. A case study approach will be utilized. This course requires 50 hours of field experience.
Term Offered: Spring

SPED 5310 Advanced Instructional Methods For Teaching Students With Mild Educational Needs
[3 credit hours]
Theoretical considerations for designing instruction, lesson plan development using direct, explicit instructional approach, differentiation, co-teaching, and evidence-based practices to meet the needs of students with mild disabilities in school settings will be examined. Research-based approaches to teaching language arts, mathematics, science, and social studies, will be explored.
Term Offered: Spring, Fall

SPED 5320 Practicum II - Mild Needs
[1 credit hour]
Provides opportunities for field experience to use and refine the strategies for persons with mild disabilities.
Corequisites: SPED 5310
Term Offered: Spring, Fall

SPED 5340 Effective Management of Students with Special Needs in Educational Settings
[3 credit hours]
This course focuses on research-based strategies to promote appropriate behaviors and decrease challenging behaviors in classroom settings. Topics include the functions of behavior; designing preventative and management interventions for behaviors resistance to class-wide behavior supports; data collection; progress monitoring; and restorative, collaborative practices; and parent education addressing evidence-based practices appropriate in the home setting. A case-based approach will be used.
Term Offered: Spring

SPED 5380 Transition Process from High School to Post-Secondary Settings for Students w Disabilities
[3 credit hours]
This course prepares the pre-service special education interventionist to support students with disabilities during the transition from high school to post-secondary settings. The course will address several issues regarding transition, including legislation, assessment and planning, and evidence-based instructional strategies. Special emphasis will be placed on self-determination through self-advocacy.
Prerequisites: Upper Division with a score of 1
Term Offered: Spring, Fall

SPED 5980 Special Topics In Special Education
[1-5 credit hours]
An advanced course for graduate students in special education or related fields. Topics are selected based on needs of the population. Student may repeat this course under different section numbers.
Term Offered: Spring, Summer, Fall

SPED 5990 Independent Study In Special Education
[1-5 credit hours]
Individual study provides graduate students with opportunities to work individually on professional problems with faculty of the Depart of Special Education Services. Individual meetings with sponsoring faculty are held.
Term Offered: Spring, Summer, Fall

SPED 6070 Curriculum Models And Intervention Strategies In Early Childhood Special Education
[3 credit hours]
Atypical infant, toddler, and early childhood development will be examined. Specialized intervention techniques, their research and practice base and appropriate curriculum models will be explored.
Term Offered: Fall

SPED 6110 Practices of Teaching Learners with Exceptionalities
[3 credit hours]
This course is designed for candidates completing licensure. Teacher candidates will gain initial special education content that will assist in understanding students with exceptionalities and laws governing special education. In addition, teacher candidates will learn about the implementation of specially designed instruction for students with exceptionalities attending an inclusive classroom. This course will also focus on data collection, assessment, collaboration, and teaming.
Corequisites: SPED 6210
Term Offered: Fall

SPED 6130 Advanced Practices for Inclusive and Specialized Teaching
[3 credit hours]
This course is designed for candidates completing licensure and helps teacher candidates advance their practice. Continued content concentrating on the implementation of specially designed instruction for students with exceptionalities commonly attending an inclusive classroom will be continued. Additionally, data collection and assessment will be studied with respect to daily lesson planning, IEP writing, and behavioral management. IEP writing and functional behavior plans will be created based on a case study in the field. Collaboration and teaming with families will continue to be investigated.
Prerequisites: SPED 6110 with a minimum grade of C
Term Offered: Spring

SPED 6190 Policy, Context, and Hallmarks of Special Education
[3 credit hours]
This course is designed for candidates completing licensure. Teacher candidates will gain initial special education content that will assist in understanding students with exceptionalities and laws governing special education. In addition, teacher candidates will learn about the implementation of specially designed instruction for students with exceptionalities attending an inclusive classroom. This course will also focus on data collection, assessment, collaboration, and teaming.
Term Offered: Spring, Summer, Fall

SPED 6210 Practicum in Teaching Learners with Exceptionalities
[1 credit hour]
This course will provide directed practicum teaching experiences in general education (15 weeks) and special education (15 weeks) for candidates completing licensure. In this placement, teacher licensure candidates will use information about students' learning and performance to plan and deliver instruction that will close the achievement gap. They will create a learning environment that is physically and emotionally safe. Candidates will have the opportunity to work in educational settings with experienced teachers.
Corequisites: SPED 6110
Term Offered: Fall

SPED 6230 Internship in Inclusive and Specialized Teaching
[2 credit hours]
This course will provide directed planned field experiences in general education (15 weeks) and special education (15 weeks) for candidates completing licensure. In this placement, teacher licensure candidates will create learning situations in which students work independently and collaboratively in an environment that is respectful, supportive, and caring. Candidates will motivate students to work productively and assume responsibility for their own learning. Full responsibility for the classroom is expected by the end of the student teaching experience.
Prerequisites: SPED 6210 with a minimum grade of C
Corequisites: SPED 6130
Term Offered: Spring

SPED 6250 Issues and Research in Transition and Post-Secondary Outcomes for Students with Disabilities
[3 credit hours]
The course explores the history, ethics, legislation, case law, policy, and research that inform educational and programmatic decisions in the transition education field. This course requires 10 hours of field experience.
Term Offered: Spring

SPED 6330 Internship/Student Teaching for Intervention Specialist
[4 credit hours]
This course provides pre-service special education interventionists with a full-time student teaching experience with students with disabilities. Teaching experiences may occur in classrooms found within the continuum of placements, ranging from (not limited to) general education with consult to special schools. Full responsibility for the classroom is expected by the end of the student teaching experience.
Prerequisites: SPED 5320 with a minimum grade of C or SPED 5190 with a minimum grade of C
Corequisites: CI 6190
Term Offered: Spring

SPED 6900 Independent Research In Special Education
[1-5 credit hours]
Independent Research provides opportunities to work on individual research under the direction of faculty. The student meets with the instructor at intervals and conducts research without formal class meeting.

SPED 6920 Master's Research Project In Special Education
[1-5 credit hours]
The master's project is an individually designed product which meets the final activity requirement for completion of the masters degree.
Term Offered: Spring, Summer, Fall

SPED 6930 Seminars In Special Education
[1-5 credit hours]
Seminars will consider problems and provide advanced study in the field of Special Education. A student may register for more than one seminar during a graduate program.
Term Offered: Spring, Summer, Fall

SPED 6940 Internship/Externship In Special Education
[1-8 credit hours]
Provides the advanced graduate student with supervised practicum experiences at an off-campus site; including schools, hospitals, agencies, rehabilitation clinics, work training sites and other community sites where persons with disabilities are served.
Term Offered: Spring, Summer, Fall

SPED 6990 Independent Study In Special Education
[1-5 credit hours]
Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Department of Special Education Services. Individual meetings with sponsoring faculty are held.
Term Offered: Spring, Summer, Fall

SPED 7000 Issues In Special Education
[3 credit hours]
Examination of causes and characteristics, identification procedures, and potential of learners who significantly deviate from the norm mentally, physically and behaviorally. Issues related to services for persons with disabilities will be studied.
Term Offered: Spring, Summer, Fall

SPED 7150 Advanced Practicum For Teaching Students With Moderate Educational Needs
[1 credit hour]
This course is taken with SPED 5160 to apply strategies and techniques for teaching students with moderate educational needs. Forty hours of required field.
Term Offered: Spring

SPED 7160 Advanced Instructional Methods For Teaching Students With Moderate Educational Needs
[3 credit hours]
This course focuses on a community-referenced functional curricula approach to teaching children and youths with moderate to severe delays. An in-depth study of inclusionary activities, community-based instruction, social skills.
Term Offered: Spring, Fall

SPED 7170 Partnerships in Transition Planning
[3 credit hours]
An in-depth study of strategies for linking young adults with disabilities to avenues leading to productive and fulfilling employment. Supported/customized employment and the development of successful business partnerships to create jobs and careers for young adults with disabilities will be addressed. Leadership roles within the area of transition services will be emphasized.
Term Offered: Fall

SPED 7180 Advanced Instructional Methods For Teaching Students With Intensive Educational Needs
[3 credit hours]
An in-depth examination of appropriate curriculum models, instructional strategies and adaptations, and related behavior problems for students with severe and multiple disabilities. A transdiciplinary team approach is explored.
Term Offered: Spring

SPED 7190 Practicum II - Intensive Needs
[1 credit hour]
This course is to apply strategies and techniques for teaching students with intensive needs.
Corequisites: SPED 5180
Term Offered: Spring

SPED 7210 Augmentative and Alternative Communication
[3 credit hours]
This course will provide an overview of alternative or augmentative modes of communication for children who are unable to meet their daily communication needs through natural modes such as speech, gestures or handwriting.
Term Offered: Fall

SPED 7250 Assessment and Planning in Transition Education and Services
[3 credit hours]
The course examines the planning and programming that supports young adults with disabilities during their transition from school to adult life. The course will cover several issues in the area of transition, including models of transition, planning, evidence-based instruction, assessment, transition planning, and progress monitoring. Course content will prepare the student to have a leadership role in curriculum development.
Term Offered: Fall

SPED 7260 Family And Professional Relations In Special Education
[3 credit hours]
Effective parent and professional partnerships will be explored. Interpersonal communication skills, legal issues, effective models for home-school communication, and differences in culture, values and family expectations will be discussed.
Term Offered: Spring, Summer, Fall

SPED 7270 Team Models And Community Networking In Early Intervention
[3 credit hours]
This course will focus on the skills, knowledge and ethical practices essential to the provision of effective service coordination and teaming for early intervention and early childhood special education. In addition, students will examine various models of teaming and consultation approaches and address issues related to working with individuals from cultural backgrounds other than their own.
Term Offered: Spring, Summer, Fall

SPED 7280 Management Of The Learning Environment In Early Childhood Special Education
[3 credit hours]
This class will provide an analysis of the various aspects of quality environments, in the home and early childhood centers for young children with special needs. Students will identify characteristics of natural environments and design interventions that promote positive child outcomes. Critically thinking about evidence-based practices found in the special education professional literature will be emphasized.
Term Offered: Spring

SPED 7310 Advanced Instructional Methods For Teaching Students With Mild Educational Needs
[3 credit hours]
Theoretical considerations for designing instruction, lesson plan development using direct, explicit instructional approach, differentiation, co-teaching, and evidence-based practices to meet the needs of students with mild disabilities in school settings will be examined. Research-based approaches to teaching language arts, mathematics, science, and social studies, will be explored.
Term Offered: Spring, Fall

SPED 7320 Practicum II - Mild Needs
[1 credit hour]
Provides opportunities for field experience to use and refine the strategies for persons with mild disabilities.
Corequisites: SPED 5310
Term Offered: Spring, Fall

SPED 7340 Advanced Behavior Management
[3 credit hours]
This course provides training inservice teachers to become managers of intra-communication and interpersonal relationships in diverse special education settings. Nonviolent Crisis Prevention/Intervention (CPI) training required.
Term Offered: Spring

SPED 7610 Seminar I: Orientation to Interprofessional Teaming
[1 credit hour]
Become familiar with requirements for the Certificate in Interprofessional Teaming. Focus on competencies needed to work collaboratively with professionals to meet the needs of individuals with disabilities and their families.
Prerequisites: SPED 7270 with a minimum grade of D-
Term Offered: Summer

SPED 7630 Seminar III: Evidence-Based Practice and Innovation in Teaming
[1 credit hour]
Issues related to principles of ethical practice, professional and advocacy. Ways in which technology can promote effective teaming practices with other professionals as well as with family members.
Prerequisites: SPED 7620 with a minimum grade of D-
Term Offered: Summer

SPED 7980 Special Topics In Special Education
[1-5 credit hours]
An advanced course for graduate students in special education or related fields. Topics are selected based on needs of the population. Student may repeat this course under different section numbers.
Term Offered: Spring, Summer, Fall

SPED 7990 Independent Study In Special Education
[1-5 credit hours]
Individual study provides graduate students with opportunities to work individually on professional problems with special education faculty. Individual meetings with sponsoring faculty are held.
Term Offered: Spring, Summer, Fall

SPED 8070 Curriculum Models And Intervention Strategies In Early Childhood Special Education
[3 credit hours]
Atypical infant, toddler, and early childhood development will be examined. Specialized intervention techniques, their research and practice base and appropriate curriculum models will be explored. Supporting professional development at various organizational levels is addressed.
Term Offered: Fall

SPED 8250 Issues and Research in Transition and Post-Secondary Outcomes for Students with Disabilities
[3 credit hours]
The course explores the history, ethics, legislation, case law, policy, and research that inform educational and programmatic decisions in the transition education field. Emphasis will be placed on developing the knowledge, skills, and disposition of being a leader in the field of transition services.
Term Offered: Spring

SPED 8430 Policy and Leadership in Special Education
[3 credit hours]
This course examines the societal, legislative, and community-level factors that shape the field of special education. Students will analyze policies, laws, and cultural attitudes toward individuals with disabilities and explore their influence on service provision, advocacy, and inclusive practices. By developing leadership strategies, students will learn to navigate and influence systemic change, fostering equity and promoting innovative solutions within the special education landscape.
Term Offered: Fall

SPED 8450 Adaptive Development and Support Systems in Special Education
[3 credit hours]
This course explores adaptive systems that indirectly influence individuals with special needs, focusing on family support networks, school systems, and community resources. Students will learn to design, evaluate, and enhance social, emotional, and behavioral support systems that foster cohesive and comprehensive development. The course emphasizes the use of evidence-based practices to address the needs of individuals with disabilities across diverse settings.
Term Offered: Spring

SPED 8460 Evidence-Based Practices in Special Education
[3 credit hours]
This course examines advanced concepts and frameworks for supporting individuals with disabilities through evidence-based interventions and systemic practices. Designed for future researchers, faculty, and school administrators, the course focuses on critically analyzing research-driven strategies and their impact on educational, behavioral, and social-emotional outcomes. Emphasis is placed on designing and evaluating interventions that address complex needs across diverse educational settings and stakeholder systems. Students will engage in scholarly inquiry, apply theoretical frameworks, and develop innovative projects to advance the field of special education.
Term Offered: Fall

SPED 8490 Collaborative Research in Advanced Special Education
[3 credit hours]
This course provides a collaborative platform for doctoral-level special education students to engage with peers on advanced research topics in special education. Students will present their current research ideas, receive structured peer feedback, and participate in discussions on cutting-edge issues in the field. This seminar fosters academic community, enhances research rigor, and promotes collective problem-solving.
Term Offered: Spring

SPED 8900 Independent Research In Special Education
[1-5 credit hours]
Independent Research provides opportunities to work on individual research under the direction of faculty. The student meets with the instructor at intervals and conducts research without formal class meeting.
Term Offered: Spring, Summer, Fall

SPED 8940 Internship/Externship In Special Education
[1-8 credit hours]
Provides the advanced graduate student with supervised practicum experiences at an off-campus site; including schools, hospitals, agencies, rehabilitation clinics, work training sites and other community sites where persons with disabilities are served.
Term Offered: Spring, Summer, Fall

SPED 8960 Doctoral Dissertation In Curriculum & Instruction
[1-12 credit hours]
The doctoral dissertation is an original scholarly product required of all students completing the doctoral degree in Special Education Services.
Term Offered: Spring, Summer, Fall

SPED 8990 Independent Study In Special Education
[1-5 credit hours]
Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Department of Special Education Services. Individual meetings with sponsoring faculty are held.
Term Offered: Spring, Fall

Speech Language Pathology (SLP)

SLP 6000 Advanced Practicum In Communication Disorders
[2 credit hours]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected.
Term Offered: Spring, Summer, Fall

SLP 6001 Advanced Practicum in Communication Disorders II
[2 credit hours]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected. SLP 6000 is a pre-requisite for this course.
Prerequisites: SLP 6000 with a minimum grade of D-
Term Offered: Spring

SLP 6002 Advanced Practicum III
[2 credit hours]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected. SLP 6000 and 6001 are a pre-requisite for this course.
Prerequisites: SLP 6000 with a minimum grade of D- and SLP 6001 with a minimum grade of D-
Term Offered: Summer

SLP 6010 Diagnostic Practicum In Communication Disorders
[2 credit hours]
Provides a minimum of 30 hours supervised diagnostic practicum with a variety of communicatively disordered cases.
Term Offered: Spring, Fall

SLP 6011 Diagnostic Practicum in Communication Disorders II
[2 credit hours]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected.
Prerequisites: SLP 6010 with a minimum grade of D-
Term Offered: Summer

SLP 6040 Exploring Research in Speech Language Pathology
[2 credit hours]
This course will guide graduate students in an exploration of the methods and process of research in Speech and Language Pathology. In addition, the students will be guided in the process of critically reviewing research pertinent to the field. The course will culminate in the development of an independent research project or paper, that will lead to their comprehensive exam/project required for graduation.
Term Offered: Spring, Fall

SLP 6100 Diagnosis Of Speech And Language Disorders
[3 credit hours]
Detailed analysis of formal and informal instruments and procedures designed to evaluate speech and language disorders.
Term Offered: Spring, Summer, Fall

SLP 6210 Language Development and Disorders: Early Childhood
[3 credit hours]
This course provides the conceptual framework for understanding language disorders in preschool children. Special emphasis is placed on application and theory of assessment as well as intervention strategies in for early intervention, school, and private settings.
Term Offered: Spring, Fall

SLP 6220 Language Disorders In School-Age Children
[3 credit hours]
The conceptual framework for understanding language disorders in school-age children with special emphasis on language assessment and language interventions in school settings.
Term Offered: Spring, Fall

SLP 6300 Phonological And Articulatory Disorders
[3 credit hours]
Advanced study of phonological and articulatory disorders including developmental apraxia. Focus on phonological differences in multi-cultural society with emphasis on assessment of disorders and current advances in remediation.
Term Offered: Spring, Summer, Fall

SLP 6400 Adult Language and Cognitive Communication Disorders
[5 credit hours]
Advanced course exploring normal and disordered neural anatomy and physiology for communication and cognition. Student will demonstrate knowledge of assessment and treatment of cognitive and linguistics deficits due to trauma and disease to central nervous systems.
Term Offered: Spring, Fall

SLP 6500 Motor Speech Disorders
[3 credit hours]
Adult apraxia and dysarthrias are discussed in relation to neurological organization, disorders and speech characteristics.
Term Offered: Spring, Fall

SLP 6550 Trends in Technology for Communication Disorders
[3 credit hours]
Introduction to the study and application of assistive technology, including augumentative and alternative communication devices, to aid communication for persons incapable of producing functional oral communication. The course includes device characteristics, program features, and intervention strategies as well as current trends in technological advances that includes but are not limited to devices such as iPads, smartphone applications, and software.
Term Offered: Spring, Summer, Fall

SLP 6600 Voice and Resonance Disorders
[3 credit hours]
An advanced course in the nature, evaluation and treatment of voice and resonance disorders. Major voice and resonance disorders in adults and children are emphasized.
Term Offered: Summer

SLP 6650 Feeding and Swallowing Disorders
[3 credit hours]
This course introduces the student to the nature, evaluation, and management of feeding and swallowing disorders from infancy through adulthood.
Term Offered: Spring, Summer, Fall

SLP 6700 Assessment And Remediation Of Fluency Disorders
[3 credit hours]
An advanced course to develop skills in the assessment and remediation of fluency disorders with special emphasis on current trends in stuttering therapy.
Term Offered: Spring, Summer, Fall

SLP 6750 Professional Issues in Speech Language Pathology
[2 credit hours]
This course will provide students with the opportunity to learn about specific issues related to working in a variety of professional settings.
Term Offered: Spring, Fall

SLP 6800 Aural Rehabilitation
[3 credit hours]
Aural (Re)Habilitation examines communication assessment and intervention approaches over the lifespan for individuals with both peripheral and central auditory perceptual issues. Emphasis is placed upon early identification and education to minimize and alleviate communication and related problems commonly associated with hearing impairment and auditory perceptual disorders.
Term Offered: Spring, Summer, Fall

SLP 6920 SLP Concomitant Project
[1 credit hour]
Students present an evidenced based project that demonstrates comprehensive understanding of all they learned during the graduate program through the application of critical thinking skills.
Prerequisites: SLP 6040 with a minimum grade of B
Term Offered: Spring, Fall

SLP 6940 Adult Internship In Speech-Language Pathology
[6 credit hours]
Provides the advanced graduate student with supervised practicum experiences with the adult population at an off-campus site; including hospitals, agencies, rehabilitation clinics, work training sites and other community sites where persons with disabilities are served.
Term Offered: Spring, Summer, Fall

SLP 6941 Pediatric Internship in Speech-Language Pathology
[6 credit hours]
Provides the advanced graduate student with supervised practicum experiences with the pediatric population at an off-campus site; including schools, hospitals, agencies, rehabilitation clinics, and other community sites where persons with disabilities are served.
Term Offered: Spring, Summer, Fall

SLP 6960 Master Research Thesis In Speech-Language Pathology
[1-5 credit hours]
The master's thesis is an individually designed investigation approved by the thesis committee and designed to contribute to the knowledge base of the speech-language pathology. Meets the final activity requirement for completion of the master's degree.
Term Offered: Spring, Summer, Fall

SLP 6990 Independent Study In Speech-Language Pathology
[1-5 credit hours]
Provides students the opportunity to work independently on professional problems under the direction of a faculty member in the Department of Speech Language Pathology.
Term Offered: Spring, Summer, Fall

SLP 6995 Independent Studies in Clinical Practicum
[2 credit hours]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected.
Term Offered: Spring, Summer, Fall

Surgery (SURG)

SURG 600 Career Exploration in Vascular Surgery
[3 credit hours]
This course is designed to give M3 students the opportunity to explore their career expectations, comparing and contrasting these with a career in Vascular Surgery. M3 students will spend approximately 2 weeks experiencing the elements of a career in Vascular Surgery. Students will be incorporated into the team, allowing a closer investigation of the student's' career expectations including work hours, work settings, required tasks, and work-life balance. Students should reflect on how their career goals parallel the expectations and demands of a career in Vascular Surgery.
Term Offered: Spring, Summer, Fall
Third Year Med Elective

SURG 601 Career Exploration Elective in Hepatobiliary Surgery
[3 credit hours]
This course is designed to give M3 students the opportunity to explore their career expectations, comparing and contrasting these with a career in Anesthesiology. M3 students will spend approximately 2 weeks experiencing the elements of a career in Hepatobiliary Surgery. Students will be incorporated into the team, allowing a closer investigation of the student's' career expectations including work hours, work settings, required tasks, and work-life balance. Students should reflect on how their career goals parallel the expectations and demands of a career in Hepatobiliary Surgery.
Third Year Med Elective

SURG 602 Career Exploration Elective in Endocrine Surgery
[3 credit hours]
This course is designed to give M3 students the opportunity to explore their career expectations, comparing and contrasting these with a career in Psychiatry. M3 students will spend approximately 2 weeks experiencing the elements of a career in Psychiatry. Students will be incorporated into the team, allowing a closer investigation of the student's career expectations including work hours, work settings, required tasks, and work-life balance. Students should reflect on how their career goals parallel the expectations and demands of a career in Psychiatry.
Third Year Med Elective

SURG 702 Cardiothoracic Surgery - UTMC
[3 credit hours]
Students will be give an individualized opportunity to participate in the activities of the Division of Cardiothoracic Surgery. Opportunities may be available for clinical experience in the operating room, in management of adult and pediatric cardiac surgical patients, or in clinical research. The focus will be the development of an understanding of the basic and clinical sciences as they pertain to cardiovascular surgical procedures and pulmonary resection.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 703 Surgery
[1-15 credit hours]
Surgery (10 weeks)
Term Offered: Spring, Summer, Fall

SURG 704 Cardiothoracic Surgery - UTMC
[6 credit hours]
Students will be given an individualized opportunity to participate in the activities of the Division of Cardiothoracic Surgery. Opportunities may be available for clinical experience in the operating room, in management of adult and pediatric cardiac surgical patients, or in clinical research. The focus will be the development of an understanding of the basic and clinical sciences as they pertain to cardiovascular surgical procedures and pulmonary resection.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 706 Trauma Surgical Intensive Care
[0-6 credit hours]
Students will be integral members of the SICU and Trauma service caring for the critically ill general surgery and trauma surgery patients. Students will work intimately with surgical and anesthesia residents assigned to the Trauma/SICU Service and the Trauma/SICU Attendings who round daily. Students attend daily rounds, trauma alerts, as well as M&M Conference and Grand Rounds. Studenst will gain experience in modern diagnosis and treatment of surgical disease and related professional skills such as the patient's personal reaction to disease and recognition of social personal factors contributing to disease, particulary in a trauma setting.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 707 Trauma Night Shift Elective – TTH
[6 credit hours]
This is a trauma night shift rotation. Students will be integral members of the Level 1 Trauma service caring for the critically ill general surgery and trauma surgery patients on night shifts. Students will work intimately with surgical attendings, residents, and PA's assigned to Trauma nights. The schedule will be Tuesday-Saturday. The goal is to develop the knowledge, skills, and attitudes necessary to evaluate, diagnose, and manage trauma patients that come in overnight. Students will be involved in resuscitations, emergency management, ICU/urgent inpatient management, and assisting with procedures in the OR.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 712 General Surgery - UTMC
[6 credit hours]
Students will be integrated into the general surgery service as a member of the surgical team, participating in all aspects of patient management, both inpatient and outpatient, which includes daily rounding on inpatients, completing both history and physicals on clinic patients, working up the preoperative patient, assisting in the operating room and endoscopy. The student will be expected to complete at least 40 hours per week on the service.
Prerequisites: SURG 703 with a minimum grade of P or SURG 740 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 713 SICU AI
[6 credit hours]
Students will be integral members of the SICU service caring for the critically ill general surgery and trauma surgery patients. Students will work closely with surgical, emergency medicine, and anesthesia residents assigned to the SICU Service and the SICU Attendings who round daily. Students attend daily rounds as well as Quality Improvement Conference and Grand Rounds. Students will gain experience in modern diagnosis and treatment of surgical disease and related professional skills such as the patient's personal reaction to disease and recognition of social personal factors contributing to disease. Required to perform 3 H&P's and participate in the discharge/transfer of the patient to step down unit.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 714 Vascular Surgery
[6 credit hours]
This course is designed to further enhance the M4 students knowledge of vascular disease process with the physiological approach to understanding the pre and post-operative patient with vascular disease. Particular emphasis is on fluid, clotting mechanisms, renal, pulmonary, and cardiac status. The student will spend time in the operating room and the vascular lab to learn techniques and interpretation of vascular studies. Students will be required to perform at least 3 full H&P's and 3 discharge summaries.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 716 General Surgery AI - UTMC
[6 credit hours]
Students will be integrated into the service as a member of the surgical team, participating in all aspects of patient management, both inpatient and outpatient. Students will participate in all aspects of patient management both inpatient and outpatient. Attend daily rounds, participate in the OR, and see patients in an inpatient and outpatient setting. Students will be required to perform 3 H&P's and 3 Discharge Summaries.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 717 Vascular Surgery
[3 credit hours]
Exposure to the surgery of the vascular disease process with the physiological approach to understanding the pre and post operative patient with vascular disease. Particular emphasis is on fluids, clotting mechanisms, renal, pulmonary, and cardiac status. The student will spend time in the vascular lab to learn techniques and interpretation of vascular studies. Each acting intern must complete two online modules to prepare the acting intern for their roles as teachers of junior medical students.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 719 Colorectal Surgery
[3 credit hours]
Students will be integrated into the service as a member of the surgical team, participating in all aspects of patient management, both inpatient and outpatient. The student will be expected to complete at least 40 hours per week on the service.
Prerequisites: SURG 740 with a minimum grade of P or SURG 703 with a minimum grade of P
ACGME/Clinical Med Elective

SURG 720 Colorectal Surgery
[6 credit hours]
Students will be integrated into the service as a member of the surgical team, participating in all aspects of patient management both inpatient and outpatient. The student will be expected to complete at least 40 hours per week on the service.
Prerequisites: SURG 703 with a minimum grade of P or SURG 740 with a minimum grade of P
ACGME/Clinical Med Elective

SURG 721 General Surgery - Adrian
[6 credit hours]
Students will be integrated into the general surgery service as a member of the surgical team, participating in all aspects of patient management, both inpatient and outpatient, which includes daily rounding on inpatients, completing both history and physicals on clinic patients, working up the preoperative patient, assisting in the operating room and endoscopy. The student will be expected to complete at least 40 hours per week on the service.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 722 Vascular Surgery Wound Care
[3 credit hours]
Students will be assigned to work with wound care faculty and midlevels on the Vascular Surgery Service. Students will learn the different types of wounds, how to treat them, the etiology and how to manage them. They will be overseen by the vascular surgery fellows, surgical residents, and Vascular, Infectious disease, Podiatry and Plastics faculty. There will be exposure to a wide variety of wound care. Students will work up and manage acute and chronic wounds. Students will spend time in the wound care clinic at The Toledo Hospital to understand the techniques of wound care dressing and how to manage them. Students will also participate in the OR when wound care requires anesthesia.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 723 Vascular Surgery - Toledo Hospital
[3 credit hours]
Students will be exposed to the vascular disease process with the physiological approach to understanding the pre and post-operative patient with vascular disease. There will be exposure to the full spectrum of vascular disease with particular emphasis on fluids, clotting mechanisms, renal, pulmonary, and cardiac status. The student will spend time in the vascular lab to learn techniques and interpretation of vascular studies. Students should understand the pathophysiology of both arterial and venous disease by the competition of their rotation.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 724 Vascular Surgery Wound Care BAHEC
[3 credit hours]
Students will be assigned to work with Wound Care Solutions medical director Dr. George Magill. Students will learn the different types of wounds, how to treat them, the etiology and how to manage them. There will be exposure to a wide variety of wound care. Students will work up and manage acute and chronic wounds. Students will spend time in the wound care clinic at Community Hospitals and Wellness Centers to understand the techniques of wound care dressing and how to manage them. Students will also participate in the OR when wound care requires anesthesia.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 725 Cardiothoracic Surgery - TTH
[3 credit hours]
Students will be given an individualized opportunity to participate in the activities of the Division of Cardiothoracic Surgery. Opportunities may be available for clinical experience in the operating room, in management of adult and pediatric cardiac surgical patients, or in clinical research. The focus will be the development of an understanding of the basic and clinical sciences as they pertain to cardiovascular surgical procedures and pulmonary resection.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 727 Cardiothoracic Surgery - TTH
[6 credit hours]
Students will be given an individualized opportunity to participate in the activities of the Division of Cardiothoracic Surgery. Opportunities may be available for clinical experience in the operating room, in management of adult and pediatric cardiac surgical patients, or in clinical research. The focus will be the development of an understanding of the basic and clinical sciences as they pertain to cardiovascular surgical procedures and pulmonary resection.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 729 Vascular Surgery AI - TTH
[6 credit hours]
Students will be assigned to one of two clinical vascular services. Students will function at an intern level and work up patients on their own, which will then be overseen by the vascular surgery fellows, surgical residents, and faculty rotating on the Vascular Service. There will be exposure to the full spectrum of vascular disease. Students should understand the pathophysiology of both arterial and venous disease by the competition of their rotation. Students will spend time in noninvasive vascular laboratory to understand the techniques and the basics of interpreting a noninvasive vascular studies. Students will be required to take 2 overnight calls per month. Students will be required to perform at least 3 full H&P's and 3 discharge summaries.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 732 General Surgery Acting Internship - Toledo Hospital
[6 credit hours]
Students will be integrated into the service as a member of the surgical team and function as an intern on the service under the supervision of faculty and resident staff. Students will participate in all aspects of patient management, both inpatient and outpatient. Attend daily rounds, participate in the OR, and see patients in the clinic/outpatient setting. Students will be required to perform 3 H&P's and 3 discharge summaries
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 733 General Surgery Acting Internship - St. Joseph's Mercy
[6 credit hours]
Students will be integrated into the service as a member of the surgical team, participating in all aspects of patient management, both inpatient and outpatient. Students will participate in all aspects of patient management both inpatient and outpatient. Attend daily rounds, participate in the OR, and see patients in an inpatient and outpatient setting. Students will be required to perform 3 H&P's and 3 Discharge Summaries.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 734 General Surgery Acting Internship - Riverside
[6 credit hours]
Students will be integrated into the service as a member of the surgical team, participating in all aspects of patient management, both inpatient and outpatient. Students will participate in all aspects of patient management both inpatient and outpatient. Attend daily rounds, participate in the OR, and see patients in an inpatient and outpatient setting. Students will be required to perform 3 H&P's and 3 Discharge Summaries.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 735 Surgical Oncology/Endocrinology Surgery - Toledo Hospital
[3 credit hours]
Students will be integrated into the service as a member of the surgical team, participating in all aspects of Endocrine Surgery and HPB (hepatobiliary and pancreatic) Surgical Oncology patient management, both inpatient and outpatient settings. This includes performing surgical histories, surgical physical exams, presenting patients on rounds, selecting diagnostic studies, suturing and assisting in the OR. Students should prepare a 15 minute teaching presentation based on a topic or case that interests them. Examples might include: Genetic Syndromes, pancreatic cancer, liver masses, thyroid cancer, thyroid nodules, hyperthyroidism, hyperparathyroidism, adrenal nodules, etc.). This rotation is best suited for students with an interest in pursuing surgery as a career option. Students will have the opportunity of practicing on the robot simulator and may have the option to help writing manuscripts and abstracts.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 736 Colorectal Surgery - Trinity Health
[6 credit hours]
Students will be integrated onto the colorectal service as an integral member of the surgical team, participating in all aspects of patient management, both inpatient and outpatient. Students will be expected to complete an accurate H&P, attend rounds and accurately present patients, manage the pre and postoperative patient. Students will also participate in endoscopic procedures and learn the management of those patients.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 737 Vascular Surgery - Acting Internship Trinity Health
[6 credit hours]
This course is designed to further enhance the M4 student's knowledge of vascular disease process with the physiological approach to understanding the pre and post-operative patient with vascular disease. Particular emphasis is on fluid, clotting mechanisms, renal, pulmonary, and cardiac status. The student will spend time in the operating room and the vascular lab to learn techniques and interpretation of vascular studies. Students will be required to perform at least 3 full H&P's and 3 discharge summaries.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 738 SICU/Acute Care Surgery - Acting Internship Trinity Health
[6 credit hours]
Students will be integral members of the Acute Care Surgery and SICU service caring for the critically ill general surgery and trauma surgery patients. Students will work intimately with the surgical team assigned to the SICU and Acute Surgery Service and attendings who round daily. Students attend daily rounds, respond to critical consults, participate in the operating room, and attend conferences. Students will gain experience in modern diagnosis and treatment of surgical disease and related professional skills such as the patient's personal reaction to disease and recognition of social personal factors contributing to disease, particularly in a trauma setting. Student required to perform at least 3 full H&P's and 3 discharge summaries. Students will participate in overnight call.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 739 Acute Care Surgery-Gen A
[6 credit hours]
Students will be integral members of the Acute Care Surgery service caring for the general surgery and acute care surgery patients. Students will work intimately with the surgical team assigned to the Acute Care Surgery Service responding to daytime emergent inpatient consults. Students will gain experience in modern diagnosis and treatment of emergent general surgery patients. Students will participate in all aspects of patient management both in and outpatient, attend daily rounds and participate in the operating room. Will function as an intern and be assigned patients to work up. Students are required to perform at least 3 full H&P's and 3 discharge summaries. Students will participate in overnight call.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 740 Surgery: Required Remediation
[9 credit hours]

SURG 741 Elective General and Bariatric Surgery-Gen B
[6 credit hours]
Elective Description/Requirements: Students will be integral members of the elective general surgery and bariatric surgery service caring for the general surgery and bariatric surgery patients. Students will work intimately with the surgical team of attendings and residents assigned to the elective and bariatric general surgery B service. Students will participate in the work up of both elective general surgery patients and bariatric surgery patients from the preoperative assessment in the clinic to the operating room followed by the post operative follow up in the clinic. Students will function as interns on the service under the supervision of the attendings and residents. Students will gain experience in modern diagnosis and treatment of elective and bariatric patients. Students will participate in all aspects of patient management both in and outpatient, attend daily rounds and participate in the operating room. Students are required to perform at least 3 full H&P's and 3 discharge summaries. Students will participate in overnight call.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 742 General Surgery and Breast Care
[3 credit hours]
Students will be integral members of the elective general surgery and breast care surgery service caring for the general surgery and breast cancer surgical patients. Students will work intimately with the Dr. Jessica Burns and residents assigned to the service. Students will participate in the work up of both elective general surgery and breast care patients from the preoperative assessment in the clinic to the operating room followed by the post operative follow up in the clinic. Students will gain experience in modern diagnosis and treatment of the breast care patient. Students will participate in all aspects of patient management both in and outpatient, attend daily rounds and participate in the operating room.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 743 General Surgery GI and Bariatrics
[3 credit hours]
Students will be integral members of the elective general surgery and bariatric surgery service caring for the general surgery and bariatric surgery patients. Students will work intimately with the Dr. Sarah Pratt and residents assigned to the bariatric and GI service. Students will participate in the work up of both elective general surgery/GI patients and bariatric surgery patients from the preoperative assessment in the clinic to the operating room followed by the post operative follow up in the clinic. Students will gain experience in modern diagnosis and treatment of GI surgery and bariatric patients. Students will participate in all aspects of patient management both in and outpatient, attend daily rounds and participate in the operating room.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 744 Acute Care/Trauma Night Shift
[6 credit hours]
This is an acute care/trauma night shift rotation. Students will be integral members of the Acute Care and Trauma service caring for the critically ill general surgery and trauma surgery patients on night shifts. Students will work intimately with surgical attendings, residents, and PA's assigned to Acute Care/Trauma nights. The schedule will be Monday-Friday 6:30p-6:30a. The goal is to develop the knowledge, skills, and attitudes necessary to evaluate, diagnose, and manage trauma patients that come in overnight. Students will be involved in resuscitations, emergency management, ICU/urgent inpatient management, and assisting with procedures in the OR.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 746 Acute Care/Trauma Night Shift
[3 credit hours]
This is an acute care/trauma night shift rotation. Students will be integral members of the Acute Care and Trauma service caring for the critically ill general surgery and trauma surgery patients on night shifts. Students will work intimately with surgical attendings, residents, and PA's assigned to Acute Care/Trauma nights. The schedule will be Monday-Friday 6:30p-6:30a. The goal is to develop the knowledge, skills, and attitudes necessary to evaluate, diagnose, and manage trauma patients that come in overnight. Students will be involved in resuscitations, emergency management, ICU/urgent inpatient management, and assisting with procedures in the OR.
Prerequisites: SURG 703 with a minimum grade of P
Term Offered: Spring, Summer, Fall
ACGME/Clinical Med Elective

SURG 747 ENT - Head and Neck Surgery Acting Internship
[6 credit hours]
This course is designed for students pursuing Otolaryngology residency to further enhance their knowledge of common disease processes of head and neck surgery, and to explore management of disease process with the physiological approach to understanding the pre and post-operative patient with these disorders. The student will spend time in the operating room and the office to learn surgical techniques and inpatient and outpatient care. Students will be required to perform at least 3 full H&P's and 3 discharge summaries.
Prerequisites: SURG 703 with a minimum grade of P
ACGME/Clinical Med Elective

SURG 748 General Surgery UTMC
[3 credit hours]
Students will be integrated into the general surgery service as a member of the surgical team, participating in all aspects of patient management, both inpatient and outpatient, which includes daily rounding on inpatients, completing both history and physicals on clinic patients, working up the preoperative patient, assisting in the operating room and endoscopy. The student will be expected to complete at least 40 hours per week on the service.
Prerequisites: SURG 740 with a minimum grade of P or SURG 703 with a minimum grade of P
ACGME/Clinical Med Elective

SURG 749 General Surgery St Vincent's
[6 credit hours]
Students will be integrated into the general surgery service as a member of the surgical team, participating in all aspects of patient management, both inpatient and outpatient, which includes daily rounding on inpatients, completing both history and physicals on clinic patients, working up the preoperative patient, assisting in the operating room and endoscopy. The student will be expected to complete at least 40 hours per week on the service.
Prerequisites: SURG 740 with a minimum grade of P or SURG 703 with a minimum grade of P
ACGME/Clinical Med Elective

SURG 750 Surgery Away Elective
[0-6 credit hours]

SURG 751 Surgery Away Elective
[0-3 credit hours]

SURG 6010 Leadership in Health Care
[3 credit hours]
Seminar course conducted on a weekly basis with the goal of developing skills and knowledge related to leadership. The seminars are based around guest moderators, selected pre-class readings, in class group discussion, supplemental blackboard discussion, and/or online video discussions.
Term Offered: Spring, Summer

SURG 6020 Medical Research, Simulation, Innovation, and Education
[3 credit hours]
Students will gain expertise in the areas of clinical, medical education, and simulation research through team-based learning and mentorship. Students will design and execute the steps of an education and/or simulation-based research project during the course, or alternatively a medical research question, culminating in production of an abstract reporting preliminary results. Specific learning in regards to qualitative-style research will be provided. Research can address any problem of the student's choice, provided it adequately demonstrates understanding of research theory, proper statistics and analysis, and manuscript writing.
Prerequisites: PUBH 6000 with a minimum grade of C and PUBH 6010 with a minimum grade of C
Term Offered: Spring, Summer

Theatre (THR)

THR 5250 Administration and Management of the Arts
[3 credit hours]
Administration and Management of the Arts will provide undergraduate and graduate students with an advanced look at the managerial, structural, and operational functions of visual and performing arts organizations, translating traditional business practices into the language of the arts.
Term Offered: Spring, Summer, Fall

THR 5260 Promoting the Visual and Performing Arts
[3 credit hours]
Promoting the Visual and Performing Arts will provide undergraduate and graduate students with an advanced look at the theoretical and functional practice of publicizing and advancing visual and performing arts organizations, ranging from consumer behaviors and analysis to campaign communications and strategies.
Term Offered: Spring, Summer, Fall

Theory and Social Foundations (TSOC)

TSOC 5000 Introduction to Educational Theory and Social Foundations
[3 credit hours]
This course prepares master's students for professional activity and research in the interdisciplinary field of Social Foundations of Education. It draws on social sciences and humanities to interpret and critique the relationship between school and society.
Term Offered: Fall

TSOC 5100 Network Theory and Educational Reform
[3 credit hours]
This course examines intrapersonal and interpersonal principles of high performing teams and the impact of meaningful relationships both in real-world and virtual environments. Individual and group dynamics are explored through foundational (sociological, philosophical) and political lenses. The course explores elements of effective group membership and leadership in both theoretical and practical applications.
Term Offered: Spring, Summer, Fall

TSOC 5110 Modern Educational Controversies
[3 credit hours]
Examines controversial contemporary educational issues, the forces that perpetuate them and the socio-cultural contexts in which they exist. Teachers' work and ethical tenets shaping practice are also examined.
Term Offered: Spring, Summer

TSOC 5200 Sociology of Education
[3 credit hours]
Introduction to sociological theory and method through critical examination of the socio-cultural foundations of schooling in the United States, including purposes of schooling in a multicultural society and the resulting nature of teacher work.
Term Offered: Spring, Summer, Fall

TSOC 5210 Social Justice in American Society
[3 credit hours]
Examines through models of social justice how race, class, gender, ethnicity and disability intersect with power, culture, knowledge and ideology in American schools and other institutions to influence the lives of citizens in a multicultural society.
Term Offered: Spring

TSOC 5230 Critical Responses to Deculturalization
[3 credit hours]
In-depth history of racial and ethnic minorities in the U.S. and the ongoing tension between deculturalization and democratic pluralism in P-12 and higher education including current theories and practical applications.
Term Offered: Spring

TSOC 5300 Philosophy of Education
[3 credit hours]
The course explores the nature of philosophical inquiry as foundational to the theory and practice of education, including teaching, through the exploration of competing philosophical traditions. The course provides an opportunity for students to articulate their own philosophy of education.
Term Offered: Spring, Summer, Fall

TSOC 5400 History of Education
[3 credit hours]
This course examines the evolving role of schooling and teaching over time in the US as an instrument of education. It uses history to reflect on the relationship of schooling to other social institutions, groups of people, and the process of social change. It encourages students from across the spectrum of educational areas of study to historically contextualize their discipline and their own practice.
Term Offered: Spring, Fall

TSOC 5500 Anthropology of Education
[3 credit hours]
Examination of cross-cultural, comparative and other studies directed toward understanding processes of cultural transmission and transformation, and implications of anthropological research for contemporary issues in education.
Term Offered: Spring, Summer, Fall

TSOC 5600 Foundations of Peace Education
[3 credit hours]
The purpose of this course is to introduce the basic concepts, theories, and approaches to peace education. The course explores the theories of peace education, including pedagogical approaches to peace-learning. The course also introduces the substantive areas of peace education.
Term Offered: Summer, Fall

TSOC 6000 Women, Culture And Pedagogy
[3 credit hours]
This course surveys works of prominent feminist scholars in order to address the impact of dominant ideology upon the lives of women and girls in American schools.

TSOC 6120 International Education
[3 credit hours]
Complex interrelationships between global issues and education systems will be examined. Emphasis will be on how education can be used to build a more global society. Some sections of the course will include an international field trip.
Term Offered: Spring, Fall

TSOC 6140 School-State Relations
[3 credit hours]
This course provides an examination of the historical, legal, and sociological interactions between state and schooling in the US. It explores the historical development of the social, political, and economic purposes of schooling and the impact on diverse populations. It offers students an opportunity to examine issues such as how schools have defined a good citizen and what they have done to create these in religious and secular means.
Term Offered: Spring, Fall

TSOC 6190 Seminar In Educational Theory/Social Foundations
[3 credit hours]
The collaborative study of a specific topic in educational theory and social foundations by a group of advanced students under the direction of one or more professors.
Term Offered: Spring, Fall

TSOC 6240 Sociological Analyses Of Urban Education
[3 credit hours]
Development and dynamics of schooling in urban centers across the United States, including historical and critical analyses of current problems, issues and reform initiatives.
Prerequisites: TSOC 5200 with a minimum grade of D- or TSOC 5210 with a minimum grade of D- or TSOC 7200 with a minimum grade of D- or TSOC 7210 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

TSOC 6310 Major Educational Theorists
[3 credit hours]
An examination of selected educational philosophers who have addressed themselves to the problem of the ends and means of education from Classical Hellenic Times to the present.
Term Offered: Spring, Fall

TSOC 6320 Education And The Democratic Ethic
[3 credit hours]
Examination of the interdependence among education, democracy and ethics in the context of civic life. Applications made to the practice of schooling as cultural production in a democratic society.
Prerequisites: TSOC 5200 with a minimum grade of D- or TSOC 5300 with a minimum grade of D- or TSOC 5400 with a minimum grade of D- or TSOC 7200 with a minimum grade of D- or TSOC 7300 with a minimum grade of D- or TSOC 7400 with a minimum grade of D-
Term Offered: Spring, Fall

TSOC 6330 Corrective Justice and the Ethics of Conflict
[3 credit hours]
This course provides an overview of theories and principles of corrective justice and the ethics of conflict as well as the application of these theories and principles to matters of justice and injustice.
Term Offered: Spring, Fall

TSOC 6340 Human Rights Education
[3 credit hours]
The purpose of this seminar is to explore the nature of human rights and human rights education. The origin, definition, content, scope, foundation, and correlative duties of human rights, as well as, the theory of human rights education will be explored.
Term Offered: Spring, Fall

TSOC 6350 Environmental Ethics and Education
[3 credit hours]
The purpose of this seminar is to explore the nature of environmental ethics and its implications for educational theory, in particular moral and civic education.
Term Offered: Fall

TSOC 6360 Theories of Justice and Educational Policy
[3 credit hours]
The purpose of this class is to explore prominent theories of distributive justice in a liberal democratic republic and to analyze key educational policy issues from the perspective of those theories.
Term Offered: Spring, Fall

TSOC 6900 Master's Seminar in Educational Theory and Social Foundations
[3 credit hours]
Students are guided step by step to propose, research, and write a Master's thesis or project. Exact format and substance of the thesis or project is highly individualized, reflecting nature of students' interests, audiences, and purposes.
Term Offered: Spring, Fall

TSOC 6960 Master's Thesis In Educational Theory And Social Foundations
[1-3 credit hours]
A formal, independent study culminating in a written discourse that advances our understanding of educational theory or social foundations.
Term Offered: Spring, Summer, Fall

TSOC 6980 Master's Project In Educational Theory And Social Foundations
[1-3 credit hours]
A formal, independent project applying principles of educational theory or social foundations to analyze a particular problem and culminating in a written discourse.
Term Offered: Spring, Summer, Fall

TSOC 6990 Independent Study In Educational Theory And Social Foundations
[1-3 credit hours]
Directed study of a current topic in educational theory and social foundations. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Summer, Fall

TSOC 7100 Network Theory and Educational Reform
[3 credit hours]
This course examines intrapersonal and interpersonal principles of high performing teams and the impact of meaningful relationships both in real-world and virtual environments. Individual and group dynamics are explored through foundational (sociological, philosophical) and political lenses. The course explores elements of effective group membership and leadership in both theoretical and practical applications.
Term Offered: Spring, Summer, Fall

TSOC 7110 Modern Educational Controversies
[3 credit hours]
Examines controversial contemporary educational issues, the forces that perpetuate them and the socio-cultural contexts in which they exist. Teachers' work and ethical tenets shaping practice are also examined.
Term Offered: Spring, Summer

TSOC 7200 Sociology of Education
[3 credit hours]
Introduction to sociological theory and method through critical examination of the socio-cultural foundations of schooling in the United States, including purposes of schooling in a multicultural society and the resulting nature of teacher work.
Term Offered: Spring, Summer, Fall

TSOC 7210 Social Justice in American Society
[3 credit hours]
Examines through models of social justice how race, class, gender, ethnicity and disability intersect with power, culture, knowledge and ideology in American schools and other institutions to influence the lives of citizens in a multicultural society.
Term Offered: Spring

TSOC 7230 Critical Responses to Deculturalization
[3 credit hours]
In-depth history of racial and ethnic minorities in the U.S. and the ongoing tension between deculturalization and democratic pluralism in P-12 and higher education including current theories and practical applications.
Term Offered: Spring

TSOC 7300 Philosophy of Education
[3 credit hours]
The course explores the nature of philosophical inquiry as foundational to the theory and practice of education, including teaching, through the exploration of competing philosophical traditions. The course provides an opportunity for students to articulate their own philosophy of education.
Term Offered: Spring, Summer, Fall

TSOC 7400 History of Education
[3 credit hours]
This course examines the evolving role of schooling and teaching over time in the US as an instrument of education. It uses history to reflect on the relationship of schooling to other social institutions, groups of people, and the process of social change. It encourages students from across the spectrum of educational areas of study to historically contextualize their discipline and their own practice.
Term Offered: Spring, Fall

TSOC 7500 Anthropology of Education
[3 credit hours]
Examination of cross-cultural, comparative and other studies directed toward understanding processes of cultural transmission and transformation, and implications of anthropological research for contemporary issues in education.
Term Offered: Spring, Summer, Fall

TSOC 7600 Foundations of Peace Education
[3 credit hours]
The purpose of this course is to introduce the basic concepts, theories, and approaches to peace education. The course explores the theories of peace education, including pedagogical approaches to peace-learning. The course also introduces the substantive areas of peace education.
Term Offered: Summer, Fall

TSOC 8000 Women, Culture, And Pedagogy
[3 credit hours]
This course surveys works of prominent feminist scholars in order to address the impact of dominant ideology upon the lives of women and girls in American schools.

TSOC 8100 Seminar in Social & Philosophical Foundations of Education
[3 credit hours]
This course prepares doctoral students for professional activity and research in the interdisciplinary field of Social Foundations of Education. It draws on social sciences and humanities to interpret and critique the relationship between school and society.
Term Offered: Fall

TSOC 8120 International Education
[3 credit hours]
Complex interrelationships between global issues and education systems will be examined. Emphasis will be on how education can be used to build a more global society. Some sections of the course will include an international field trip.
Term Offered: Spring, Fall

TSOC 8140 School-State Relations
[3 credit hours]
This course provides an examination of the historical, legal, and sociological interactions between state and schooling in the US. It explores the historical development of the social, political, and economic purposes of schooling and the impact on diverse populations. It offers students an opportunity to examine issues such as how schools have defined a good citizen and what they have done to create these in religious and secular means.
Term Offered: Spring, Fall

TSOC 8150 CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT
[3 credit hours]
This course aims to develop a broader understanding of the role of culture in psychological processes and the implications of such psychological understanding for a culturally diverse society.
Term Offered: Spring

TSOC 8190 Seminar In Educational Theory/Social Foundations
[3 credit hours]
The collaborative study of a specific topic in educational theory and social foundations by a group of advanced students under the direction of one or more professors.
Term Offered: Spring, Fall

TSOC 8240 Sociological Analyses Of Urban Education
[3 credit hours]
Development and dynamics of schooling in urban centers across the United States, including historical and critical analyses of current problems, issues and reform initiatives.
Prerequisites: TSOC 5200 with a minimum grade of D- or TSOC 5210 with a minimum grade of D- or TSOC 7200 with a minimum grade of D- or TSOC 7210 with a minimum grade of D-
Term Offered: Spring, Summer, Fall

TSOC 8310 Major Educational Theorists
[3 credit hours]
An examination of selected educational philosophers who have addressed themselves to the problem of the ends and means of education from Classical Hellenic Times to the present.
Term Offered: Spring, Fall

TSOC 8320 Education And The Democratic Ethic
[3 credit hours]
Examination of the interdependence among education, democracy and ethics in the context of civic life. Applications made to the practice of schooling as cultural production in a democratic society.
Prerequisites: TSOC 5200 with a minimum grade of D- or TSOC 5300 with a minimum grade of D- or TSOC 5400 with a minimum grade of D- or TSOC 7200 with a minimum grade of D- or TSOC 7300 with a minimum grade of D- or TSOC 7400 with a minimum grade of D-
Term Offered: Spring, Fall

TSOC 8330 Corrective Justice and the Ethics of Conflict
[3 credit hours]
This course provides an overview of theories and principles of corrective justice and the ethics of conflict as well as the application of these theories and principles to matters of justice and injustice.
Term Offered: Spring, Fall

TSOC 8340 Human Rights Education
[3 credit hours]
The purpose of this seminar is to explore the nature of human rights and human rights education. The origin, definition, content, scope, foundation, and correlative duties of human rights, as well as, the theory of human rights education will be explored.
Term Offered: Spring, Fall

TSOC 8350 ENVIRONMENTAL ETHICS AND EDUCATION
[3 credit hours]
The purpose of this seminar is to explore the nature of environmental ethics and its implications for educational theory, in particular moral and civic education.
Term Offered: Fall

TSOC 8360 Theories of Jstce and Ed Plcy
[3 credit hours]
The purpose of this class is to explore prominent theories of distributive justice in a liberal democratic republic and to analyze key educational policy issues from the perspective of those theories.
Term Offered: Spring, Fall

TSOC 8380 Methods of Normative Theory Construction
[3 credit hours]
The purpose of this course is to explore methods of and approaches to normative theory construction. The central goal of the course is to equip doctoral students in the field of educational theory and social foundations, among other students whose fields engage in normative theory, the understanding and skill necessary to engage in normative theory construction. Normative theory refers to systematic moral, political, social, and educational conceptions that rationally account for adjust what ought to be (rather than empirical theory that accounts for what is). In the discipline of normative theorizing a number of methods of and approaches to theory construction have been developed as a means to the development and analysis of normative theory. There are two main approaches to theory construction in this field: deontological and teleological approaches.
Term Offered: Spring, Fall

TSOC 8390 Methods of Conceptual Analysis and Textual Interpretation
[3 credit hours]
The purpose of this research methods course is to explore prominent methods and approaches Central Analysis and Textual Interpretation. These methods and approaches constitute the research tools in the field of educational theory and social foundations, among other fields of inquiry. The central goal of the course is to equip doctoral students in field of educational theory and social foundations, among other students whose fields engage in theoretical research, the understanding and skill necessary to engage in theoretical research.

TSOC 8960 Dissertation Research In Foundations Of Education
[1-12 credit hours]
A formal, independent study culminating in a written discourse central to the advancement of knowledge in educational theory or social foundations.
Term Offered: Spring, Summer, Fall

TSOC 8990 Independent Study In Educational Theory And Social Foundations
[1-6 credit hours]
Directed study of a current topic in educational theory and social foundations. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Summer, Fall

Women and Gender Studies (WGST)

WGST 5860 Seminar in Feminist Theory
[3 credit hours]
This introduction to global feminist thought familiarizes students with feminist terminology and a variety of feminist theoretical frameworks.
Term Offered: Spring

WGST 5880 Queer and Sexuality Theories-WAC
[3 credit hours]
An overview of the complexities, contradictions, and conflicts in the rapidly shifting field sometimes known as Queer Studies. This course attempts to walk a line between the hyberabstraction of "clasic theoretical" concepts/texts and their more "concrete" contextualized locations in communities and identities. This course focuses on the field that emerged from the g/l/b/t movement as it moved into the academy in the l990's.
Term Offered: Spring

WGST 5900 Seminar in Women's Studies
[3 credit hours]
Seminar focused on timely topics in Women's Studies chosen by rotating faculty.
Term Offered: Spring

WGST 5980 Special Topics Gender
[3 credit hours]
A course on specialized topics in Women's and Gender Studies. Consult schedule of courses for topics to be studied and semester offered.
Term Offered: Spring, Summer, Fall

WGST 6240 Research and Methods in Women's and Gender Studies
[3 credit hours]
This course will present an overview of the ways in which women's/gender/feminist studies have informed and complicated traditional theories of research and methodologies. Students will examine and use various research methods and tools to prepare a final research project.
Term Offered: Fall

WGST 6250 Feminism and U.S. Film
[3 credit hours]
This course will focus on the representation of women in dominant U.S. cinema with a particular interest in the filmic responses created by independent women film makers. We will examine the celluloid construction of women and gender presented in classic Hollywood Cinema using the tools of feminist analysis and discourse. We will be particularly concerned with the ways in which gender, race, class and sexuality shape the cinematic representations of women.
Term Offered: Fall

WGST 6260 Women, Gender & Disability
[3 credit hours]
This course will be an interdisciplinary exploration of the intersections of gender and disability and the significance of these categories of analysis as they are understood and experienced by American women with and without disabilities.
Term Offered: Spring

WGST 6980 Directed Readings in Women's and Gender Studies
[1-4 credit hours]
Supervised independent reading and research on selected topics. Student meets individually with instructor to develop a detailed written proposal. The course provides students with the opportunity to read independently on a topic related to gender studies under the direction of a WGST faculty member.
Term Offered: Spring, Summer, Fall

WGST 6990 Independent Project in WGST
[1-4 credit hours]
Supervised independent project. Students work with a faculty member to design a semester long project that utilizes the knowledge and skills gained through the certificate program. The course provides students with the opportunity to develop an individual project related to gender studies under the close supervision of a WGST faculty member.
Term Offered: Spring, Fall

WGST 8000 Independent Study in Women's and Gender Studies
[1-3 credit hours]
Directed study of a specific topic under the supervision of a Women's and Gender Studies faculty member. The student meets with the instructor at arranged intervals without formal classes.
Term Offered: Spring, Summer, Fall

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