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Department of Art

Barbara Miner, Chair
David Guip, Director of Graduate Studies

Degrees Offered

• M.Ed. in Art Education (p. 10)

AED 5000 Research In Art Education
[4 credit hours (4, 0, 0)]
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 (0, 3, 0)]
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 5150 Setting The Stage For Early Childhood Learning: Inspirations From Reggio Emilia
[3 credit hours (0, 0, 15)]
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.

AED 5200 Computer Graphics In Art Education
[3 credit hours (0, 3, 0)]
This course examines the tools, technology and instructional application of computer graphics education settings. The course is appropriate for art educators as well as others interested in using graphics and the microcomputer.
Term Offered: Spring

AED 5220 Issues In Therapeutic Art
[3 credit hours (3, 0, 0)]
The study of art processes that provide physical, emotional and intellectual development. Topics covered include art history, art appreciation, aesthetics, making art and art materials.
Term Offered: Fall

AED 5240 Adaptive Methods In Art Education For Special Populations
[3 credit hours (3, 0, 0)]
This course is designed to provide understanding of how art experiences relate to special populations. Students will research and develop strategies and instructional adaptations for use with special populations in a therapeutic or rehabilitative setting.
Prerequisites: AED 5200
AED 5300 Media And Methods In Therapeutic Art  
[3 credit hours (3, 0, 0)]  
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  
Term Offered: Spring  
AED 5320 The Art Museum And The Art/Humanities Educator  
[3 credit hours (3, 0, 0)]  
This course will introduce the role of the museum for the art/humanities educator and will examine the installation and design of exhibitions and the implications for teaching. Life center issues, museum education, curriculum issues, interactive galleries and technology will be presented.  
Term Offered: Spring, Summer, Fall  
AED 5930 Advanced Seminar In Philosophy Of Art Education  
[1-4 credit hours (0, 0, 0-4)]  
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 (0, 0, 0-4)]  
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 (0, 0, 0-4)]  
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 (0, 0, 0-4)]  
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 (0, 0, 0-4)]  
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  

M.Ed. in Art Education  
For requirements of the master of arts in art education degree, students must meet requirements for the degree as stated in the Judith Herb College of Education (http://www.utoledo.edu/education/depts/ci/programs/artED.html) graduate section of the catalog.  

Department of Communication  
David Tucker, Chair  

Degrees Offered  
• Certificate in Communication Studies (p. 10)  
COMM 6200 Communication Research Methods  
[3 credit hours (0, 0, 3)]  
Research methods, design and conventions in social scientific communication research including measurement, operationalizations, experimental and quasi-experimental design, analysis interpretation and reporting of findings, including quantitative and qualitative approaches.  
Term Offered: Spring  
COMM 6210 Principles And Practices Of Visual Communication  
[3 credit hours (0, 0, 3)]  
This course explores the influence of factors like color and design on human visual communication, the role of Gestalt principles, and the impact of various forms of visual communication.  
Term Offered: Fall  
COMM 6220 Communication, Technology, And Society  
[3 credit hours (0, 0, 3)]  
This course covers issues in communication technology including media, policy and strategic planning. Particular emphasis is given to the information revolution, communication industry development, and the marketplace for communication products.  
Term Offered: Fall  
COMM 6230 Communication, Propaganda And Persuasion  
[3 credit hours (0, 0, 3)]  
This seminar examines techniques of persuasion in social science research and applications and how this knowledge is used for the engineering of perception, mobilization and consent in organizations and society.  
Term Offered: Spring  
COMM 6240 Communication, Ethics And The Workplace  
[3 credit hours (0, 0, 3)]  
This course evaluates the impact of ethics on job performance, public perception of companies or agencies, and the ramifications of personal decision-making on the worker's job satisfaction and long-range goals.  
COMM 6260 Business, Communication And Technology  
[3 credit hours (0, 0, 3)]  
The course examines how organizations use media and communication strategies. Effective tools of communication to be studied include face-to-face interaction, dessemination of information through mass media, and communication through technologies.  
Term Offered: Spring, Summer  
COMM 6980 Special Topics In Communication Studies  
[3 credit hours (0, 0, 3)]  
Examination of emerging issues and topics in the field of communication. May be repeated for credit in different specialized topics.  
Term Offered: Spring, Summer, Fall  

Certificate in Communication Studies  
The graduate certificate in communication studies is designed to provide advanced study in professional and organizational communication. The certificate of communication studies requires the successful completion of 18 credit hours in communication studies. The certificate can be earned separately or as a part of the master of liberal studies degree. See
the master of liberal studies (p. 47) program for details on the master of liberal studies with a certificate in communication studies.

**Application**

Applications are not currently being accepted.

The certificate consists of 18 credit hours of graduate courses in communication studies. Students may use the courses completed for the certificate in the electives portion of the master of liberal studies degree.

**Curriculum**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 6200</td>
<td>Communication Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>COMM 6980</td>
<td>Special Topics In Communication Studies</td>
<td>3</td>
</tr>
</tbody>
</table>

The remaining 12 hours must be selected from the following courses: 15

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 6210</td>
<td>Principles And Practices Of Visual Communication</td>
<td></td>
</tr>
<tr>
<td>COMM 6220</td>
<td>Communication, Technology, And Society</td>
<td></td>
</tr>
<tr>
<td>COMM 6230</td>
<td>Communication, Propaganda And Persuasion</td>
<td></td>
</tr>
<tr>
<td>COMM 6240</td>
<td>Communication, Ethics And The Workplace</td>
<td></td>
</tr>
<tr>
<td>COMM 6260</td>
<td>Business, Communication And Technology</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 21

**Department of Economics**

*Kevin Egan, Chair*

*David Black, Director of Graduate Studies*

**Degrees Offered**

- M.A. in Economics (p. 12)
- M.A. in Economics and Education (p. 13)
- M.A. in Economics with an Applied Econometrics Specialization (p. 13)

**ECON 5050 Population Economics**

[4 credit hours (4, 0, 0)]

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 or ECON 1200

**Term Offered:** Spring

**ECON 5120 Monetary Theory**

[4 credit hours (4, 0, 0)]

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 or ECON 3120 or ECON 3150

**Term Offered:** Spring

**ECON 5130 Monetary And Fiscal Policy**

[3 credit hours (3, 0, 0)]

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 or ECON 4120

**Term Offered:** Spring

**ECON 5150 Advanced Macroeconomic Theory**

[4 credit hours (4, 0, 0)]


**Prerequisites:** ECON 3150

**Term Offered:** Fall

**ECON 5200 Advanced Microeconomic Theory**

[4 credit hours (4, 0, 0)]

Advanced topics in microeconomic theory, consumer behavior, the firm and market structure, distribution theory, equilibrium conditions, welfare economics.

**Prerequisites:** ECON 3200

**Term Offered:** Fall

**ECON 5240 Applied Environmental Economics**

[4 credit hours (4, 0, 0)]

The economics of the environment and natural resources. Examination of economic instruments for solving environmental problems. Analyzed policies include direct regulation, user charges, taxes on polluting products and marketable permits.

**Prerequisites:** ECON 3200

**Term Offered:** Spring

**ECON 5250 Labor Economics**

[4 credit hours (4, 0, 0)]

Labor force characteristics, wage determination, hours and condition of work, unemployment, labor union structure and growth, collective bargaining and modern labor legislation.

**Prerequisites:** ECON 1200

**Term Offered:** Spring

**ECON 5280 Energy Economics**

[4 credit hours (4, 0, 0)]

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 or ECON 1200

**Term Offered:** Spring

**ECON 5300 Mathematical Economics**

[3 credit hours (3, 0, 0)]

Development and applications of the mathematical tools used by economists. Differential and integral calculus, linear algebra, transcendental functions and series.

**Prerequisites:** ECON 1150 or ECON 1200

**Term Offered:** Fall
ECON 5410 American Economic History
[3 credit hours (3, 0, 0)]
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 or ECON 1200 or ECON 1880

ECON 5510 International Economics I
[4 credit hours (4, 0, 0)]
Theory of international trade; commercial policy; costs and benefits,
economic integration; trade and economic growth and balance of
payments problems.
Prerequisites: ECON 1150
Term Offered: Spring

ECON 5550 Economic Development
[3 credit hours (3, 0, 0)]
Economic problems and policies in less-developed countries, including
such topics as schooling, population growth, urbanization, landholding,
income distribution, capital formation and development strategies.
Prerequisites: ECON 1150 or ECON 1200

ECON 5620 Regional Economics
[3 credit hours (3, 0, 0)]
Examination of regional income estimates and social accounts, regional
multipliers, diverse location theories, supplemented with techniques of
regional analysis.
Prerequisites: ECON 1200

ECON 5660 Public Finance Economics
[4 credit hours (4, 0, 0)]
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

ECON 5750 Health Economics
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

ECON 5810 Econometrics Models And Methods I
[4 credit hours (4, 0, 0)]
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: (ECON 1150 and ECON 1200 and MATH 2630) or
(ECON 1150 and ECON 1200 and ECON 2640)
Term Offered: Fall

ECON 5820 Econometrics Models And Methods II
[4 credit hours (4, 0, 0)]
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
Term Offered: Spring

ECON 5830 Econometrics Models And Methods III
[3 credit hours (3, 0, 0)]
Econometric methods that apply to survey, spatial and cross-sectional/
time-series data along with other specialized modeling techniques are
covered.
Prerequisites: ECON 5810
Term Offered: Spring, Fall

ECON 5980 Current Economic Problems
[3 credit hours (3, 0, 0)]
Course content changes from time to time as important economic
problems arise.
Prerequisites: ECON 1150 or ECON 1200

ECON 6260 Behavioral Economics
[4 credit hours (4, 0, 0)]
Economic analysis of decisions made by people. Topics include decision-
making under risk and uncertainty, strategic decision-making, and
experimental economics.
Prerequisites: ECON 4810 or ECON 5810
Term Offered: Spring

ECON 6810 Seminar in Applied Econometrics I
[2 credit hours (0, 0, 2)]

ECON 6820 Seminar in Applied Econometrics II
[2 credit hours (0, 0, 2)]

ECON 6900 Graduate Research
[1-7 credit hours (0, 0, 0-3)]

ECON 6960 Thesis
[1-8 credit hours (0, 0, 0-2)]

ECON 6990 Graduate Readings
[1-7 credit hours (0, 0, 0-3)]

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 2 graduate-level Economics courses (8 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’
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):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 5150</td>
<td>Advanced Macroeconomic Theory</td>
<td>4</td>
</tr>
<tr>
<td>ECON 5200</td>
<td>Advanced Microeconomic Theory</td>
<td>4</td>
</tr>
<tr>
<td>ECON 5300</td>
<td>Mathematical Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 5810</td>
<td>Econometrics Models And Methods I</td>
<td>4</td>
</tr>
</tbody>
</table>

The graduate advisor 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 advisor.

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 master's paper.

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 seminar paper, or its equivalent, for review by at least two faculty members. No credit hours will be earned for the seminar paper.

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 2 graduate-level Economics courses (8 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.

M.A. in Economics and Education

For the degree of Master of Arts and Education, students must meet requirements for the degree as stated in the Judith Herb College of Education (p. 299) graduate section of this catalog.

M.A. in Economics with an Applied Econometrics Specialization

The master’s program with an applied econometrics specialization is designed to afford interested, well-qualified candidates for the master’s in economics an opportunity to study econometrics on a more intensive and applied basis. The applied econometrics specialization would enable candidates to develop applied econometric skills through hands-on research.

The specialization in applied econometrics is an option in the M.A. program in economics. Students who elect the specialization option will normally need two full years of study to complete the program. In the first year, an M.A. candidate in the specialization will complete the regular M.A. core requirements, an additional econometric course (ECON 5820), and field/related course work. Further, the M.A. candidate is required to pass a written comprehensive examination in econometrics, as well as the usual written comprehensive examinations required of all students. In the second year of the program, the candidate will enroll in a sequence of two applied econometrics seminars (ECON 6810 and ECON 6820) and engage in thesis work.

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):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 5150</td>
<td>Advanced Macroeconomic Theory</td>
<td>4</td>
</tr>
<tr>
<td>ECON 5200</td>
<td>Advanced Microeconomic Theory</td>
<td>4</td>
</tr>
</tbody>
</table>
The graduate adviser 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 adviser.

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 master's paper.

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 seminar paper, or its equivalent, for review by at least two faculty members. No credit hours will be earned for the seminar paper.

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.

Department of English Language and Literature

Sara Lundquist, Chair
Parama Sarkar, Director of Graduate Studies, Advisor for Graduate Students in the Literature Concentration
Anthony Edgington, Advisor for Graduate Students in Writing Studies Concentration

Students completing the MA in English may choose between two concentrations: the Concentration in Literature and the Concentration in Writing Studies. A Certificate in the Teaching of Writing is also offered.

Degrees Offered

- Certificate in the Teaching of Writing (p. 17)
- M.A. and Ed. in Literature (p. 17)
- M.A. in English with a Concentration in Literature (p. 17)
- M.A. in English with a Concentration in Writing Studies (p. 17)

ENGL 5090 Current Writing Theory
[3 credit hours (3, 0, 0)]
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 History Of The English Language
[3 credit hours (3, 0, 0)]
Study of the origins and development of the English language.
Prerequisites: ENGL 3150 or LING 3150 or ENGL 5150 or LING 5150 or ENGL 7150 or LING 7150
Term Offered: Spring, Summer, Fall

ENGL 5150 Linguistic Principles
[3 credit hours (3, 0, 0)]
Intensive study of modern linguistic theories about the nature and structure of language, with emphasis on English.
Term Offered: Spring, Fall

ENGL 5200 British Fiction: 18th Century
[3 credit hours (3, 0, 0)]
A course in 18th Century fiction with emphasis on the novels of Defoe, Richardson, Fielding, Smollett, and Sterne and their relation to historical background and literary theory.

ENGL 5210 Issues in ESL Writing
[3 credit hours (3, 0, 0)]
Course content
Term Offered: Spring, Fall

ENGL 5280 American Fiction: 20th Century
[3 credit hours (3, 0, 0)]
A study of the chief developments in content and form of the American short story and novel since World War I, partly through intensive analysis of works by selected major writers.
Term Offered: Spring, Fall

ENGL 5300 Medieval and Early Tudor Drama
[3 credit hours (0, 0, 3)]
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 mummmings, and royal entries, as well as modern revivals.

ENGL 5310 British Drama: 1580-1642
[3 credit hours (3, 0, 0)]
A study of early British drama exclusive of Shakespeare, with particular attention to Elizabethan drama and its background.

ENGL 5410 Old And Middle English Literature
[3 credit hours (3, 0, 0)]
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 English Renaissance
[3 credit hours (3, 0, 0)]
Poetry and prose of the English Renaissance, including the sonnet tradition; “Spenser’s Faire Queene”; Shakespeare’s longer poems; the prose of Raleigh, Hoby, Ascham, and Elyot; “Defense of Poesy”; More’s “Utopia.”
Term Offered: Spring, Fall
ENGL 5430 Approaches to English As A Second Language
[3 credit hours (0, 0, 3)]
Examination of a broad range of approaches to the teaching of English as a Second Language, including how these approaches fit into different theoretical assumptions and how they are implemented in practice.
Term Offered: Spring

ENGL 5460 Restoration And 18th Century British Literature
[3 credit hours (3, 0, 0)]
Drama, poetry, and prose of the Restoration, Neo-classical and pre-Romantic periods, focusing on literary strategies and themes, political and cultural contexts.
ENGL 5500 British Literature: The Romantic Period
[3 credit hours (3, 0, 0)]
Study of major authors and genres of the Romantic period: approximately 1789 to 1837.
Term Offered: Spring, Fall

ENGL 5520 British Literature: The Victorian Period
[3 credit hours (3, 0, 0)]
Study of major authors, genres and ideas of the Victorian period: approximately 1837 to 1901.
Term Offered: Spring, Fall

ENGL 5540 20th Century British Literature
[3 credit hours (3, 0, 0)]
British poetry of the early 20th century, including the works of such poets as Hopkins, Housman, Hardy, Yeats, Owen, Lawrence, Auden and Thomas, and the research and criticism relevant to them.

ENGL 5560 Literature of the British Empire 1850 to The Present
[3 credit hours (0, 0, 0)]
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 5580 American Literature Since World War II
[3 credit hours (3, 0, 0)]
Major trends in postwar American literature, including traditional and uncanonical writers. Emphasis may be on poetry or prose by instructor’s option.
Term Offered: Fall

ENGL 5590 Native American Literature And Culture
[3 credit hours (3, 0, 0)]
Native American literature interrogates a selection of texts by and about Native Americans, including the oral traditions of storytelling and mythology
Term Offered: Spring

ENGL 5620 American Literary Romanticism
[3 credit hours (3, 0, 0)]
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

ENGL 5640 Early 20th Century American Literature
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Study of African American prose, poetry, drama and fiction from 1760 to 1915.
Term Offered: Fall

ENGL 5660 African American Writing In The 20th Century
[3 credit hours (3, 0, 0)]
A literary, historical and social consideration of the achievement of black American writers since 1915.
Term Offered: Spring, Summer

ENGL 5680 American Literature Since World War II
[3 credit hours (3, 0, 0)]
Major trends in postwar American literature, including traditional and uncanonical writers. Emphasis may be on poetry or prose by instructor’s option.
Term Offered: Fall

ENGL 5690 Native American Literature And Culture
[3 credit hours (3, 0, 0)]
Native American literature interrogates a selection of texts by and about Native Americans, including the oral traditions of storytelling and mythology
Term Offered: Spring

ENGL 5750 History Of Literary Criticism
[3 credit hours (3, 0, 0)]
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

ENGL 5780 Contemporary Literary Theories And Criticism
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
An introduction to the discipline(s) of English, the methods and resources of scholarship in the field.
Term Offered: Fall

ENGL 5810 Shakespeare
[3 credit hours (3, 0, 0)]
A study of Shakespeare’s plays with emphasis on his development as a dramatist and with readings in major Shakespearian criticism.
Term Offered: Fall

ENGL 5820 Milton
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Author changes with each offering. Consult Time Schedules for authors to be studied.
Term Offered: Spring, Fall

ENGL 5980 Special Topics
[3 credit hours (3, 0, 0)]
Consideration of a special topic in literature and language.
Term Offered: Spring, Fall

ENGL 6010 Seminar In English Instruction: Composition
[3 credit hours (0, 0, 3)]
For prospective college instructors of composition. Includes supervised teaching of composition. Graded S/U only.
Term Offered: Fall

ENGL 6150 Applied Linguistics I
[3 credit hours (3, 0, 0)]
Focus on the methods of “applied linguistics” in the broad sense, through case studies including research on first and second language acquisition, language teaching, the teaching of reading and writing, and other related areas.
Prerequisites: ENGL 5150 or LING 5150
Term Offered: Fall

ENGL 6170 Applied Linguistics Research And Theory II
[3 credit hours (3, 0, 0)]
Focuses on theories of second/foreign language acquisition, especially, but not exclusively, as they relate to English as a Second Language.
Prerequisites: ENGL 6150 or LING 6150
Term Offered: Spring

ENGL 6180 Methods In Composition Research, Course Design And Assessment
[3 credit hours (0, 0, 3)]
Students will learn to use rhetorical analysis, discourse analysis and ethnographic research methodologies to write a substantial research proposal, and to design a course and write criteria for assessment of student writing accomplished in such a course.
Prerequisites: ENGL 4090 or ENGL 5090
Term Offered: Spring, Summer, Fall

ENGL 6190 Environments For Esl Learning
[3 credit hours (3, 0, 0)]
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 or ENGL 5150 or ENGL 7150 or LING 3150 or LING 5150 or LING 7150
Term Offered: Fall

ENGL 6410 Seminar: Studies In Early English Literature
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
Seminar on a specialized topic in English Renaissance literature.

ENGL 6440 Seminar: Studies In Early 17th Century Literature
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in early 17th century English literature.
Term Offered: Fall

ENGL 6460 Seminar: Studies In Restoration And 18th Century British Literature
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in Restoration and 18th century British literature.

ENGL 6500 Seminar: Studies In British Romantic Literature
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in British Romantic literature.

ENGL 6520 Seminar: Studies In Victorian Literature
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in Victorian literature.
Term Offered: Spring, Fall

ENGL 6620 Seminar: Studies In American Literary Romanticism
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in American literary Romanticism.

ENGL 6630 Seminar: Studies In American Literary Realism
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in American literary realism.

ENGL 6640 Seminar: Studies In 20th Century American Literature
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in 20th century American literature.
Term Offered: Spring, Fall

ENGL 6890 Certificate Capstone
[3 credit hours (0, 0, 3)]
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 and ENGL 5780 and ENGL 6010 and ENGL 6180)
Term Offered: Spring, Summer, Fall

ENGL 6940 Internship in English as a Second Language
[2 credit hours (0, 0, 2)]
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 (0, 0, 0-3)]
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 (0, 0, 1-3)]
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 (0, 0, 3)]  
Seminar on a specialized topic in English studies.  
Term Offered: Spring, Summer

ENGL 6990 Independent Study  
[1-3 credit hours (0, 0, 0-3)]  
By permission of department; may be repeated for additional credit.  
Term Offered: Spring, Summer, Fall

ENGL 8990 Independent Study  
[1-3 credit hours (0, 0, 0-3)]  
By permission of department; may be repeated for additional credit.  
Term Offered: Spring, Fall

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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGL 5780</td>
<td>Contemporary Literary Theories And Criticism</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 5090</td>
<td>Current Writing Theory</td>
<td>3</td>
</tr>
<tr>
<td>Praxis</td>
<td></td>
<td></td>
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<tr>
<td>ENGL 6010</td>
<td>Seminar In English Instruction: Composition ¹</td>
<td>3</td>
</tr>
<tr>
<td>Methods</td>
<td></td>
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<tr>
<td>ENGL 6180</td>
<td>Methods In Composition Research, Course Design</td>
<td>3</td>
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<tr>
<td></td>
<td>And Assessment</td>
<td></td>
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<tr>
<td>Research</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGL 6890</td>
<td>Certificate Capstone</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

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.

M.A. and Ed. in Literature

For the degree of Master of Arts and Education, students must meet requirements for the degree as stated in the Judith Herb College of Education (p. 299) Graduate Catalog. Specialization courses require approval of faculty advisors of the collaborating departments.

M.A. in English with a Concentration in Literature

The M.A. degree (literature concentration) requires 33 hours of course work. Graduate students who are accepted into the program as teaching assistants are further required to take ENGL 6010, an additional three-hour course, for a total of 36 hours.

All students working toward the Master of Arts with a concentration in literature must satisfy the following requirements:

The course work shall include:

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>One of the following two courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGL 5750</td>
<td>History Of Literary Criticism</td>
<td></td>
</tr>
<tr>
<td>or ENGL 5780</td>
<td>Contemporary Literary Theories And Criticism</td>
<td></td>
</tr>
</tbody>
</table>

At least two 6000 seminar level courses.  
6

Students who have completed any of these course requirements or their equivalents at the graduate level before admission to the College of Graduate Studies may petition the director of graduate studies in English for substitutions.

1. Of the remaining 21 hours of course work for the degree, students may take a maximum of two courses from other departments in the humanities, fine arts or social sciences, as approved by the director of graduate studies. Students may count one independent study course toward the degree.

2. Candidates must successfully pass the MA Exam and submit a satisfactory MA Portfolio, details of which can be found on the department web site.

M.A. in English with a Concentration in Writing Studies

The M.A. degree (writing studies concentration) requires 33 hours of course work.

All students working toward the Master of Arts with a concentration in writing studies must satisfy the following requirements:
Students who have completed any of these course requirements or their equivalents at the graduate level before admission to the College of Graduate Studies may petition the director of graduate studies in English for substitutions.

Electives (18 hours).

Students will take fifteen credit hours in electives from Writing Studies, Linguistics, or Literature Courses, including special topics courses to be offered yearly.

Of these remaining 18 hours of course work for the degree, students may take a maximum of two courses from other departments in the humanities, fine arts or social sciences, as approved by the director of graduate studies. Students may count one independent study course toward the degree.

Total Hours 18

Department of Geography and Planning

Daniel J Hammel, Chair  
Neil Reid, M.A. Program Director and M.A. Graduate Adviser

Degrees Offered

- Certificate in GIS and Applied Geography (p. 20)
- M.A. and Ed. in Geography and Planning (p. 20)
- M.A. in Geography and Planning (p. 21)

GEPL 5040 Geography Education Strategies  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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 (15, 0, 0)]  
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 (3, 0, 0)]  
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 or GEPL 4110  
Term Offered: Spring

GEPL 5210 Land Use Planning  
[3 credit hours (3, 0, 0)]  
A broad view 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 5310 Geography of Gypsies (Romanies) and Travelers  
[3 credit hours (3, 0, 0)]  
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 disciplines.  
Term Offered: Spring, Summer, Fall

GEPL 5420 Quantitative methods in geographic research  
[3 credit hours (3, 0, 0)]  
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  
[4 credit hours (4, 0, 0)]  
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 EEES2100 or GEPL3350.  
Term Offered: Fall

GEPL 5500 Digital Image Analysis  
[3 credit hours (3, 0, 0)]  
Explores digital image analysis techniques such as classification and principal components analysis. Terrestrial and coastal applications of satellite image analysis are performed in intensive laboratory sessions.  
Prerequisites: EEES 5490 or GEPL 5490  
Term Offered: Spring

GEPL 5520 Analytical And Computer Cartography  
[4 credit hours (4, 0, 0)]  
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 5510  
Term Offered: Spring

GEPL 5530 Principles Of Urban Planning  
[3 credit hours (3, 0, 0)]  
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 (15, 0, 0)]
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 (4, 0, 0)]
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 (4, 0, 0)]
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
Term Offered: Spring

GEPL 5570 Urban Design
[3 credit hours (3, 0, 0)]
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 5580 Physical Geography
[3 credit hours (15, 0, 0)]
This course will introduce you to the fundamental aspects of physical geography: the understanding of the physical elements and processes which comprise the environment and the spatial patterns of these elements and processes.
Term Offered: Spring

GEPL 5700 Community Planning Workshop
[3 credit hours (0, 0, 3)]
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.
Prerequisites: GEPL 4600
Term Offered: Spring

GEPL 5710 Urban Environments
[3 credit hours (15, 0, 0)]
Examines urban areas, the approaches to studying them, and explanations offered for urban processes and forms.
Term Offered: Spring, Fall

GEPL 5750 Transportation Geography
[3 credit hours (15, 0, 0)]
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 5810 Political Geography
[3 credit hours (15, 0, 0)]
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 (0, 0, 0)]

GEPL 5920 Readings in Geography
[1-3 credit hours (0, 0, 0)]

GEPL 6100 Philosophy & General Methodology
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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

GEPL 6160 Seminar In Spatial Analysis
[4 credit hours (4, 0, 0)]
A computer-based laboratory course in multivariate spatial analysis methodologies. The course includes the study of spatial graphics and mapping, computerized regionalization, areal forecasting and predictive modeling techniques.
Prerequisites: GEPL 6150

GEPL 6190 Advanced Geographic Information Systems Seminar
[4 credit hours (4, 0, 0)]
Seminar in advanced GIS topics which include database design, spatial analysis and specialized application to spatial problems.
Prerequisites: GEPL 5180 or GEPL 6180

GEPL 6200 Earth System Science Through Inquiry-Based Learning
[3 credit hours (3, 0, 0)]
The course is geared towards in-service teachers. Teachers will explore four natural events affecting the earth as a system, using inquiry-based learning and lesson plan development.
Term Offered: Summer

GEPL 6300 Seminar In Resource Management
[3 credit hours (0, 0, 3)]
Intensive group study of major themes in the resource management literature. Primary emphasis is placed on individual student research projects oriented toward resource management problems.

GEPL 6530 Seminar-Urban/Regional Planning Applications
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]  
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 6570 Seminar In Neighborhood Revitalization  
[3 credit hours (0, 0, 3)]  
Intensive group study of major themes in the revitalization of urban neighborhoods, both residential and commercial. Major emphasis is placed upon individual student research projects oriented toward specific revitalization problems.

GEPL 6580 Urban Development And Housing  
[3 credit hours (3, 0, 0)]  
Course examines the changing land use and functions of metropolitan regions. City suburban linkages, urban restructuring, urban policy and metropolitan planning issues are examined.

GEPL 6700 Teaching Practicum In Geography  
[1-6 credit hours (0, 0, 0)]  
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 (0, 0, 3)]  
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 (0, 0, 2)]  
The course is used for the completion of the comprehensive exam requirement for M.A candidates.  
Prerequisites: (GEPL 6100 and GEPL 6150)  
Term Offered: Spring, Fall

GEPL 6920 Research Design  
[3 credit hours (0, 0, 3)]  
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.  
Prerequisites: (GEPL 6100 and GEPL 6150 and GEPL 6910)  
Term Offered: Summer, Fall

GEPL 6930 General Seminar  
[3 credit hours (3, 0, 0)]

GEPL 6940 Internship In Planning  
[1-6 credit hours (0, 0, 0)]  
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 (0, 0, 2.5)]  
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 (0, 0, 0-6)]  
Work on a thesis is the culmination of graduate education and occupies most of the second year.  
Term Offered: Spring, Summer, Fall

Certificate in GIS and Applied Geography

Requirements for Completion

Student 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 a minimum of 9 credits from the list of approved GIS technical courses;
• Students must complete a final three credit project workshop based on a terminal project related to a research problem specific to their discipline;
• 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>GEPL 5180</td>
<td>Geographic Information Systems Applications</td>
<td></td>
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<tr>
<td>GEPL 5490</td>
<td>Remote Sensing Of The Environment</td>
<td></td>
</tr>
<tr>
<td>GEPL 5500</td>
<td>Digital Image Analysis</td>
<td></td>
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<tr>
<td>GEPL 5520</td>
<td>Analytical And Computer Cartography</td>
<td></td>
</tr>
<tr>
<td>GEPL 6190</td>
<td>Advanced Geographic Information Systems Seminar</td>
<td></td>
</tr>
<tr>
<td>GEPL 6950</td>
<td>Applied Geographic Workshop</td>
<td></td>
</tr>
</tbody>
</table>

M.A. and Ed. in Geography and Planning

For the degree of Master of Arts and Education, students must meet requirements for the degree as stated in the Judith Herb College of Education (p. 299) graduate section of this catalog.
M.A. in Geography and Planning

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 36 credit hours of graduate work:

1. 15 of the 36 minimum hours must be taken in the department at the 6000 level. Fifteen additional elective hours may be taken at the 5000 or 6000 level within the major. The following courses are mandatory:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>GEPL 6100</td>
<td>Philosophy &amp; General Methodology</td>
<td>3</td>
</tr>
<tr>
<td>GEPL 6150</td>
<td>Seminar In Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>GEPL 6910</td>
<td>Comprehensive Exam Preparation</td>
<td>2</td>
</tr>
<tr>
<td>GEPL 6920</td>
<td>Research Design</td>
<td>3</td>
</tr>
</tbody>
</table>

This 15-hour requirement may not include the following courses: GEPL 6700, GEPL 6910, GEPL 6940 and GEPL 6960.

2. A minimum of one graduate-level (at least three hours) course or seminar, 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 and planning courses and related courses should comprise a unified program chosen in consultation with the graduate adviser.

4. After completing 6150 and 9 hours of graduate coursework, the student may register for GEPL 6920. As part of this course, students complete a comprehensive exam and present and defend a thesis proposal. A grade of B or better in 6100, 6150, 6920, and B average or better for graduate work entitles the student to become a formal candidate for the M.A. degree.

5. The student should research and write an approved thesis under the direction of a thesis committee composed of departmental faculty members. The student may select an applied or traditional thesis option.

6. Upon completion of the thesis, an oral examination on the student’s research, as it relates to general professional competence, will be required.

7. A minimum enrollment to qualify for the master’s degree is two hours of thesis credits, but there may be as many as six hours within the 36 semester hours of graduate work.

Non-Thesis Option

For Students who 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 6980 during the Student’s final spring semester in the program.

Minimum of 36 credit hours of graduate course work.

Required courses: GEPL 6100, 5110, 5530, 6150, 5180, 6980.

Elective courses: Select one from GEPL 5650, 5550, 5750, or 5700.

15 additional hours at the 5000 or 6000 level in Geography.

Minimum of one graduate level course taken in a related field out of Geography.

B grade or better in GEPL 6100, 6150, and 6980.

Department of History

Ami Pflugrad-Jakisch, Chair
Kristen Geaman, Advisor of Graduate Studies

Degrees Offered

- M.A. and Ed. in History (p. 24)
- M.A. in History (p. 24)
- PhD in History (p. 24)

HIST 5010 Greek History
[3 credit hours (3, 0, 0)]
Selected topics on the political and social institutions of Greece in the classical and Hellenistic periods.
Term Offered: Fall

HIST 5020 Roman History
[3 credit hours (3, 0, 0)]
Selected topics on the political and social institutions of Rome during the Republic and Empire.
Term Offered: Spring

HIST 5030 Europe In The 14th-15th Centuries
[3 credit hours (3, 0, 0)]
The waning of the Middle Ages and the development of the Renaissance in Western Europe with emphasis on Italy.

HIST 5060 Age Of Absolutism
[3 credit hours (3, 0, 0)]
The growth and decline of the absolute monarchies in Europe and the development of a world market economy, c. 1550-1715.

HIST 5080 Age Of Revolution
[4 credit hours (4, 0, 0)]
The age of the French Revolution and Napoleon, c. 1785-1848.

HIST 5100 Europe Since World War I
[3 credit hours (3, 0, 0)]
Internal and international development of the major European states from World War I to the end of the twentieth century.

HIST 5150 Critics Of Victorian Society
[3 credit hours (3, 0, 0)]
Principal critics of society like Ruskin, Carlyle, Cobbett, Marx, Engels, Morris and Mill are read with a view to understanding capitalism, industrialism and England.
HIST 5170 The British Empire: For And Against
[3 credit hours (3, 0, 0)]
The emergence of England as a maritime power, as an empire, and as a financial force, with emphasis upon resistances and decolonization.
Term Offered: Fall

HIST 5200 Colonial Foundations Of The U.s.
[3 credit hours (3, 0, 0)]
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 5220 The American Revolution
[3 credit hours (3, 0, 0)]
The background and progress of the War for Independence.
Term Offered: Spring, Fall

HIST 5230 United States Early Republic
[3 credit hours (3, 0, 0)]
American politics and culture from the Federalist period to the Mexican-American War, 1789-1848.
Term Offered: Spring

HIST 5240 The Age Of Jackson
[3 credit hours (3, 0, 0)]
Jacksonian democracy in politics and as a reform movement; the sectional controversy; the Mexican-American War.

HIST 5250 Civil War And Reconstruction
[3 credit hours (3, 0, 0)]
Slavery and the Constitution in the sectional controversy, the political and military events of the Civil War, and the impact of the war on American society, 1848-1876.
Term Offered: Fall

HIST 5260 Emergence Of Modern America, 1876-1919
[3 credit hours (3, 0, 0)]
American society in the late 19th and early 20th centuries, including industrialization, urbanization, immigration, agrarian and labor revolts, politics, economic expansion, overseas initiatives, Progressive reform and involvement in World War I.
Term Offered: Spring

HIST 5270 20th Century America, 1920-1945
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 5310 History Of Native American Religious Movements
[3 credit hours (3, 0, 0)]
History of Native American revitalization movements as a response to European colonization and Indian dispossession.

HIST 5330 Western American Indians
[3 credit hours (3, 0, 0)]
Native Americans of the Far West from prehistoric times through recent years. Emphasis on European contact and governmental policies.
Term Offered: Spring

HIST 5340 Far Western Frontier
[3 credit hours (3, 0, 0)]
Native Americans; Spanish conquistadors and missionaries; American scientific and military exploration; mountain men and fur trade; international rivalries and Mexican War; gold rush of ’49.

HIST 5360 American Intellectual History I
[3 credit hours (3, 0, 0)]
Development and influence of major ideas from the colonial period to 1865. Topics include Puritanism, the Enlightenment, Democracy and Transcendentalism.
Term Offered: Spring

HIST 5370 American Intellectual History II
[3 credit hours (3, 0, 0)]
Major developments in American thought from 1865, including Social Darwinism, pragmatism, ideological conflict, modern science, education.
Term Offered: Spring

HIST 5430 Slavery In America
[3 credit hours (3, 0, 0)]
Stresses the African continuum among slaves within the context of variations in goals and policies of slaveowners, slave trade, slave economics, demographics, slave labor and formation of slave culture.
Term Offered: Spring, Summer

HIST 5450 United States and Latin America

HIST 5460 Women In American History
[3 credit hours (3, 0, 0)]
This course presents American history from early settlement to the present by examining the contributions of women, in interaction with men, to the immensely complex fabric of American life.

HIST 5470 Mexico
[3 credit hours (3, 0, 0)]
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 5480 American Labor And Working Class History
[3 credit hours (3, 0, 0)]
Development of working class communities, cultures, organizations and ideology from colonial era to the present. Topics include industrialization, unionization, labor law, gender and race constructions.

HIST 5490 Witchcraft And Magic In Medieval And Early Modern Europe
[3 credit hours (3, 0, 0)]
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
HIST 5530 History Of The Middle East Since 1500  
[3 credit hours (3, 0, 0)]  
History of the Middle East from the collapse of the Medieval Muslim States and the rise of the Ottoman Empire in the 16th century through the period of European intervention to the development of independent Middle Eastern States in the 20th century.  
Term Offered: Spring, Fall  

HIST 5620 Central Europe  
[3 credit hours (3, 0, 0)]  
Central Europe from medieval times to the present. The Habsburg Empire, Poland, the Balkans, twentieth-century changes.  

HIST 5660 Imperial Russia, 1700-1917  
[3 credit hours (3, 0, 0)]  
Rise and fall of the Russian Empire. Politics and society from the time of Peter the Great to the 1917 Revolution.  

HIST 5680 20th Century Russia  
[3 credit hours (3, 0, 0)]  
Russia from the 1917 Revolution to the present. Topics include Marxism, Communism, Stalinism, Cold War.  

HIST 5720 Modern Chinese History  
[3 credit hours (3, 0, 0)]  
China in transition under the impact of the West; forces leading to the revolution of 1911, the Nationalists’ struggle, the emergence of the People’s Republic of China and aspects of post-revolutionary China.  
Term Offered: Spring  

HIST 5740 Modern Japanese History  
[3 credit hours (3, 0, 0)]  
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  

HIST 5750 Europe And Asia: Exploration And Exchange, 1415-1800  
[3 credit hours (3, 0, 0)]  
Motivation and process of European expansion to Africa and Asia from 1415-1800.  

HIST 5790 The Holocaust  
[3 credit hours (3, 0, 0)]  
This advanced course deals with selected aspects of the history and memory of Nazi genocide against the Jews of Europe, with special emphasis on visual and survivor sources.  
Term Offered: Spring  

HIST 5830 Theory Of Public History  
[3 credit hours (3, 0, 0)]  
The definition, philosophy and evolution of public history as well as the current literature and debates within the field. Public history is the application of historical knowledge and methodology beyond academe.  

HIST 5840 Public History Practicum  
[3 credit hours (3, 0, 0)]  
Course provides students with hands-on experience in the practice of public history by completing a project using specialized techniques, client-oriented research and teamwork. May be repeated for credit.  

HIST 5940 Public History Internship  
[2-4 credit hours (0-3, 0, 0)]  
Supervised practical experience in the field of public history.  
Term Offered: Fall  

HIST 5980 Special Topics  
[1-4 credit hours (0-4, 0, 0)]  
Topics selected by various instructors.  
Term Offered: Spring, Fall  

HIST 6600 Historiography  
[3 credit hours (3, 0, 0)]  
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 (0, 0, 3)]  
Term Offered: Spring, Fall  

HIST 6950 Workshops  
[3 credit hours (0, 0, 3)]  
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 (0, 0, 0-6)]  
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 (0, 0, 0-4)]  
Term Offered: Spring, Summer, Fall
HIST 7980 Special Topics  
[1-4 credit hours (0-4, 0, 0)]  
Term Offered: Fall  

HIST 8600 Historiography  
[3 credit hours (3, 0, 0)]  
The nature of historical writing. Concepts of the historical method. The history of the writing of history from the beginning to the present: 01: America 02: Asia 03: Europe 04: Latin America 05: Africa 06: Special Topics  
Term Offered: Spring, Fall  

HIST 8930 Seminar  
[3 credit hours (0, 0, 3)]  
Term Offered: Spring, Summer, Fall  

HIST 8990 Independent Study  
[1-4 credit hours (0, 0, 0-4)]  
Term Offered: Spring, Summer, Fall  

M.A. and Ed. in History  

For the degree of Master of Arts and Education, students must meet the requirements for the degree as stated in the Judith Herb College of Education (p. 299) graduate section of this catalog. The Master of Arts and Education degree in history requires at least 21 hours of graduate credit in history or social studies (including HIST 6600, and a history seminar HIST 6930) within the total of 36 hours presented for the degree. To complete the program, students may choose either a written examination or a final project supervised by the student’s advisor in the department of history.  

M.A. in History  

All students seeking admission to graduate study are required to provide transcripts, GRE scores, three academic letters of recommendation, 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 on 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 31st. 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 tracking by completing either 30 graduate credits, including a thesis; 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.  

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>HIST 6600</td>
<td>Historiography</td>
<td>3</td>
</tr>
<tr>
<td>HIST 6930</td>
<td>Seminar (Two seminars with this course number)</td>
<td>3</td>
</tr>
<tr>
<td>HIST 6950</td>
<td>Workshops (Highly recommended)</td>
<td>3</td>
</tr>
</tbody>
</table>

PhD in History  

All students seeking admission to graduate study are required to provide transcripts, GRE scores, three academic letters of recommendation, 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 on 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 31st. 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, including 24 hours for the dissertation. Doctoral students must complete four seminars, a course in historiography, (HIST 8600), and a Professional Workshop (HIST 8950).

**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.

**Department of Music**
*Jason Stumbo, Chair*  
*David Jex, Graduate Adviser*

**Degrees Offered**
- Master of Music in Music Education (p. 27)
- Master of Music in Performance (p. 27)

**MUS 5010 University Band**  
[1 credit hour (0, 0, 1)]  
Students will perform a wide variety of band literature.  
**Term Offered:** Spring, Fall

**MUS 5020 Jazz Ensemble**  
[1 credit hour (0, 0, 1)]  
Students rehearse and perform a diverse repertoire for large jazz ensemble. Open to qualified students by audition in the first week of each semester and/or permission of instructor.  
**Term Offered:** Spring, Fall

**MUS 5030 Brass Choir**  
[1 credit hour (0, 0, 1)]  
Open to a limited number of qualified students.  
**Term Offered:** Spring

**MUS 5050 Chamber Music Ensembles**  
[1 credit hour (0, 0, 1)]  
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 5090 University Orchestra**  
[1 credit hour (0, 0, 1)]  
Open to any qualified student.  
**Term Offered:** Spring, Fall

**MUS 5130 University Chorus**  
[1 credit hour (0, 0, 2)]  
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 (0, 0, 1)]  
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 (0, 0, 3)]  
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 (0, 0, 2)]  
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 5170 Men's Chorus**  
[1 credit hour (0, 0, 2)]  
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 5180 Opera Workshop**  
[1 credit hour (0, 0, 2)]  
Open to any qualified student.  
**Term Offered:** Spring, Fall

**MUS 5190 Opera Workshop**  
[1 credit hour (0, 0, 2)]  
Open to any qualified student.  
**Term Offered:** Spring, Fall

**MUS 5410 Music History And Literature: World Music**  
[3 credit hours (3, 0, 0)]  
Explores the function and styles of music in various cultures.  
**Term Offered:** Spring
MUS 5440 Music History And Literature: Special Topics
[3 credit hours (3, 0, 0)]
The area of study will be announced at the time the course is offered.
Term Offered: Spring

MUS 5490 Music History And Literature: The Twentieth Century
[3 credit hours (3, 0, 0)]
An intensive study of the literature, composers, theorists, trends and musical styles during the 20th century.

MUS 5510 Choral Conducting
[2 credit hours (0, 0, 2)]
Conducting techniques and rehearsal routine, especially concerned with choral groups. Opportunities to direct student choral groups.
Prerequisites: MUS 3500
Term Offered: Spring, Summer, Fall

MUS 5520 Instrumental Conducting
[2 credit hours (0, 0, 2)]
Conducting techniques and rehearsal routine especially concerned with instrumental ensembles. Opportunities to direct student instrumental groups.
Prerequisites: MUS 3500
Term Offered: Spring

MUS 5590 Piano Pedagogy
[3 credit hours (0, 0, 3)]
Exploration of techniques and materials for comprehensive, private and group instruction.
Term Offered: Fall

MUS 5610 Analytical Techniques
[3 credit hours (3, 0, 0)]
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
Term Offered: Fall

MUS 5630 Counterpoint: Comparison Of Styles
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MUS 5800 Applied Music
[1-2 credit hours (0, 0, 0-1)]
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 (3, 0, 0)]
The study of sources and bibliographical materials in music.
Term Offered: Fall

MUS 6000 Master's Recital
[0 credit hours (0, 0, 0)]
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 (3, 0, 0)]
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 (2, 0, 0)]
An in-depth study of jazz pedagogical materials and methods as well as rehearsal and conducting techniques.
Term Offered: Fall

MUS 6590 Seminar In Music Arranging
[3 credit hours (0, 0, 3)]
Examination and analysis of scores of varied composers and styles; creative assignments in orchestration exploring traditional and contemporary textures and timbres.
Prerequisites: MUS 3500

MUS 6600 Jazz Composition and Arranging Seminar
[2 credit hours (0, 0, 2)]
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 6650 Seminar In Music Arranging
[3 credit hours (0, 0, 3)]
Examination and analysis of scores of varied composers and styles; creative assignments in orchestration exploring traditional and contemporary textures and timbres.
Prerequisites: MUS 3500

MUS 6690 Seminar In Music Composition
[2 credit hours (0, 0, 2)]
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 (2, 0, 0)]
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 (0, 0, 0-1)]
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 (0, 0, 0-3)]
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 (0, 0, 0-3)]
Designed to meet the needs of individual students who wish to pursue projects in the area of music.
Term Offered: Spring, Summer, Fall

Master of Music in Music Education

For requirements of the master of music education degree, students must meet requirements for the degree as stated in the Judith Herb College of Education (p. 299) graduate section of the catalog.

Master of Music in Performance

For the master of music in performance degree, students must take a minimum of 30 hours of formal course work. Of the 30 hours, a minimum of 10 hours is required in applied study, leading to a graduate recital. In addition, students will be advised to select a balance of courses (minimum of 10 hours) among music theory, music history and literature, and pedagogy. The remaining 10 hours include the required Graduate Studies in Music course - MUS 5900 (three hours), ensembles (two hours), a document (two hours) and electives (three hours).

Applicants are required to audition for the applied faculty. A diagnostic music theory and history exam will be administered before the first semester of enrollment. The Department of Music observes the UT Graduate College requirements for admission as a graduate student. All applicants must have achieved a minimum 2.7 GPA in their undergraduate degree program in music from an accredited institution. Applicants who do not have a minimum undergraduate GPA of 2.70 are required to take the GRE and report the results to the College of Graduate Studies and the Department. The department assessment of the applicant's submitted application includes examination of the applicant's transcript and letters of recommendation.

Applicants for the Masters degree in Music Performance, with an undergraduate GPA below 2.7, must achieve a combined verbal and quantitative score of at least 280 [if taken in August 2011 or later]. If they score below these standards, a student may receive provisional entrance upon the determination by the department's Graduate Committee with stipulations on achievements expected in their first semester. Students with lower scores may still be considered for admission if their academic record and audition shows a strong musical aptitude and promise. GRE scores must be sent directly from ETS to The University of Toledo. The ETS code for the university is 1845. Test scores for the GRE cannot be older than 5 years from the first day of the term that the student begins their program.

Students applying for the Masters in Performance degree must audition. When scheduling an audition, please consult the Department of Music home pages for information about dates and repertoire. If assistance is needed, contact the Music Office at 419.530.2448 or the Graduate Advisor. While it is preferred that performance majors audition in person, high quality audio/video recordings may be considered.

### Classical Track

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MUS 5900</td>
<td>Graduate Studies In Music</td>
<td>3</td>
</tr>
<tr>
<td>MUS 6000</td>
<td>Master's Recital (Students must be registered for applied music during the semester in which the recital is given.)</td>
<td>0</td>
</tr>
</tbody>
</table>

Music Electives (minimum of 10 hours)

Courses usually selected include:

- MUS 5610 Analytical Techniques
- MUS 5630 Counterpoint: Comparison Of Styles
- MUS 5410 Music History And Literature: World Music
- MUS 5490 Music History And Literature: The Twentieth Century
- MUS 5590 Piano Pedagogy
- Special topics and seminars in music theory, history and pedagogy

**Applied Music (minimum of 10 hours)**

- MUS 6800 Applied Music (two to five credits per semester)

**Ensembles**

- Ensembles chosen in consultation with the graduate adviser

**Graduate Electives**

- Music or non-music electives chosen in consultation with graduate adviser

**Recital/Document**

- MUS 6990 Independent Study

**Comprehensive Examinations**

| Total Hours | 30 |

1. Graduate courses in music theory, music history and literature and pedagogy. The choice of courses will be determined in consultation with the graduate adviser, acting on behalf of the departmental graduate committee.

2. Two to five credit hours per semester. Students are required to give a graduate recital. Students must be registered for applied music during the semester in which the recital is given.

3. A paper of 15 to 20 pages, which covers a theoretical analysis and/or historical review of the music performed on the graduate recital and/or related topics.

4. Students will be required to pass comprehensive written and oral examinations, normally given during the last semester of work.

### Jazz Studies Track

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<td>MUS 5900</td>
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<td>Master's Recital (Students must be registered for applied music during the semester in which the recital is given.)</td>
<td>0</td>
</tr>
</tbody>
</table>

**Jazz Curriculum**

10 credit hours minimum, chosen with the approval of the advisor

- MUS 6450 Jazz history, Style and Analysis
MUS 6560  Jazz Pedagogy and Conducting
MUS 6600  Jazz Composition and Arranging Seminar (may be repeated once)
MUS 6700  Jazz Improvisation Seminar (may be repeated once)
MUS 6980  Seminar: Special Topics

Applied Music (minimum of 10 hours)  10
MUS 6800  Applied Music (two to five credits per semester)  1

Ensembles (four hours minimum)
Select ensembles in consultation with the graduate advisor:  4
MUS 5020  Jazz Ensemble
MUS 5050  Chamber Music Ensembles (MUS 5050:137 Jazz Combo)
MUS 5150  Jazz Vocalstra

Graduate Electives
Music or non-music courses chosen in consultation with the graduate advisor  1

Recital/Document
MUS 6990  Independent Study  2

Comprehensive Examinations  3
Total Hours  30

1 Students are required to give a graduate recital. Students must be registered for applied music during the semester in which the recital is given.
2 A paper of 15 to 20 pages, which covers a theoretical analysis and/or historical review of the music performed on the graduate recital and/or related topics.
3 Students will be required to pass comprehensive written and oral examinations, normally given during the last semester of work.

Department of Philosophy
John Sarnecki, Chair
Benjamin Grazzini, Graduate Adviser

Degrees Offered
• M.A. in Philosophy (p. 29)

PHIL 5210 Ancient Philosophy Seminar
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
An intensive study of European philosophy after Kant, including Hegel, Marx, Kierkegaard and Nietzsche.
Term Offered: Fall

PHIL 5250 Phenomenology
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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

PHIL 5270 American Philosophy
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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

PHIL 5300 Philosophy Of Natural Science
[3 credit hours (0, 0, 3)]
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: Fall

PHIL 5400 Ethics Seminar
[3 credit hours (0, 0, 3)]
Selected topics or philosophers in ethical theory. Course may be repeated as topics vary.
Term Offered: Spring

PHIL 5550 Philosophy Of Mind
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 0-3)]
Directed study in philosophy under supervision of a philosophy faculty member.
Term Offered: Spring, Summer, Fall

PHIL 6000 Advanced Logic
[3 credit hours (0, 0, 3)]
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 (0, 0, 0-6)]
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 6930 Seminar
[3 credit hours (0, 0, 3)]
Advanced philosophy seminar open only to graduate students.

PHIL 6960 Thesis
[1-16 credit hours (0, 0, 0-2)]

M.A. in Philosophy
The Department of Philosophy offers a two-year program of study towards the completion of Master of Arts degree in Philosophy. Admissions are not restricted to students with undergraduate degrees in philosophy as well as qualified students from other academic disciplines. This program is designed to prepare students for higher level graduate work and success within a top flight Ph.D. program in philosophy as well as prepare students to teach philosophy in graduate school or at a community college level.

Our degree program includes both a thesis option (which includes an extended written treatment of a topic in the candidate’s area of specialization) and a non-thesis option (which involves additional courses and a qualifying exam in an area of specialization). Both tracks require a minimum of 33 credit hours, though students have the opportunity to pursue additional credits. Students may opt for either track, though students who do not pass the thesis qualifying examination must satisfy the non-thesis requirements to complete their MA.

For the degree of Master of Arts, students must meet the following departmental requirements:

Thesis Option
- Completion of at least 27 semester hours of graduate credit in courses offered by the department of philosophy, excluding readings and research courses;
- Pass a qualifying or prospectus examination in the area of the student’s thesis;
- A written thesis for 6 semester hours of credit;
- An oral examination covering the material of the student’s thesis and a general competency in the subject areas relevant to the thesis.

Non-Thesis Option
- Completion of 33 semester hours of graduate credit in courses offered by the department of philosophy, excluding readings and research courses;
- Completion of an examination in one sub-field or area of competency in contemporary philosophy chosen by the student in consultation with the faculty.

For Both Options
- Completion of PHIL 3000 or PHIL 6000 (or its equivalent or satisfied as an undergraduate);
- Completion of PHIL 3210 and PHIL 3230 (or their equivalents in the student’s undergraduate program);
- Completion of at least 42 semester hours of graduate and undergraduate credit in philosophy.

Students must also satisfy the requirements of the College of Graduate Studies as specified in the graduate student handbook.

Department of Political Science and Public Administration

Sam Nelson, Chair
Renee Heberle, Director, M.A. Program

Degrees Offered
- Certificate in Health Care Policy and Administration (p. 31)
- Certificate in Management of Non-Profit Organizations (p. 31)
- Certificate in Municipal Administration (p. 31)
- Joint J.D./M.P.A. Degree (p. 31)
- M.A. in Political Science (p. 31)
- Master of Public Administration (p. 32)

PSC 5220 Interest Groups In American Politics
[3 credit hours (0, 0, 3)]
This course investigates the role of interest groups in American politics. Topics include lobbying, candidate recruitment, PAC’s and agenda setting.
Term Offered: Spring, Fall

PSC 5230 Presidency
[3 credit hours (0, 0, 3)]
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 (3, 0, 0)]
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 (0, 0, 3)]
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 (3, 0, 0)]
An examination of the policy process in modern cities, focusing on the interactions between the principal political and administrative organizations in formulating and implementing policy.
Term Offered: Spring, Fall

PSC 5340 Environmental Policy And Administration
[3 credit hours (3, 0, 0)]
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 5390 Applied Politics Internship
[3 credit hours (0, 0, 3)]
A study of electoral politics, public decision-making or policy implementation through internships with candidates, political parties, public officials or governmental or nonprofit agencies.
Term Offered: Spring, Summer, Fall

PSC 5530 Civil Rights
[3 credit hours (3, 0, 0)]
A study of policy-making and implementation related to issues of race, gender and sexual orientation.
Term Offered: Summer, Fall

PSC 5550 Contemporary Issues In Law and Politics
[3 credit hours (3, 0, 0)]
Examines current controversies in U.S. law and politics, drawing on recent research in political theory, constitutional history, and legal doctrine. Includes issues such as freedom of speech, presidential powers, and religious freedom.
Term Offered: Spring

PSC 5580 Civil Rights
[3 credit hours (3, 0, 0)]
A study of the legal system governing interstate relations. Cases will be reviewed. State jurisdiction and responsibilities will be examined, emphasizing the rules of war.

PSC 5590 Law, Policy,And The Politics of Sexuality
[3 credit hours (0, 0, 3)]
This course explores law, policymaking, and public attitudes that affect gay, lesbian, bisexual and transgendered individuals in the U.S. Topics include hate crimes legislation, discrimination law, and same-sex marriage.
Term Offered: Spring, Fall

PSC 5640 The European Union
[3 credit hours (3, 0, 0)]
An analysis of the evolution, institutional structure and operation of the European Unions.
Term Offered: Spring

PSC 5650 International Political Economy
[3 credit hours (0, 0, 3)]
An analysis of the interaction of the international political and economic systems with focus on the political aspects of the international economy. Topics include economic development, interdependence, trade and multilateral institutions.

PSC 5680 Politics of Latin America
[3 credit hours (0, 0, 3)]
This course provides a survey of the Latin American region, its political transformation, and place in international politics. It covers an array of issues that have shaped and continue to shape the region: its history, its people, institutions and politics, and social and economic issues. Themes are approached both from a regional and country-level perspective.

PSC 5710 Theories Of International Politics
[3 credit hours (3, 0, 0)]
An analysis of the leading approaches to the study of international politics that contribute to the construction of a general theory.

PSC 5720 International Organizations
[3 credit hours (3, 0, 0)]
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 5740 International Relations - Middle East
[3 credit hours (3, 0, 0)]
A survey of geopolitical, economic and sociocultural factors affecting foreign policy processes; an examination of the role of the Big Powers and the United Nations. Conferences with the instructor are required.

PSC 5750 Terrorism in International Relations
[3 credit hours (0, 0, 3)]
This course will give students a comparative historical, empirical, and theoretical overview of the causes, strategies, and goals of terrorists and counter-terrorism. The primary focus of the course is on the comparative and international nature of terrorism. Global and regional case studies will be used to better understand issues related to terrorism.

PSC 5950 Mpa Research Report
[2 credit hours (0, 0, 2)]
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 (3, 0, 0)]
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 (0, 0, 0-1)]
Individual study in selected topic.
Term Offered: Spring, Summer, Fall
Certificate in Health Care Policy and Administration
(Not accepting new applicants at this time)
This program is intended for students who are interested in pursuing mid-level careers in the health-care field or for those already working in the field who want to expand their knowledge without pursuing a formal graduate degree program in health administration. The program is composed of five courses in the departments of political science and public administration, health education, finance, and related areas.

Certificate in Management of Non-Profit Organizations
(Not accepting new applicants at this time)
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.

(Not accepting applications at this time)

The program consists of four required courses from the department of political science and public administration, and marketing, and one elective selected from an approved list available from the Program Director.

Certificate in Municipal Administration
(Not accepting new applicants at this time)

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.

Joint J.D./M.P.A. Degree
(Not accepting new applicants at this time)

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 College of Arts and Letters 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.

(Not accepting new applicants at this time)

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 College of Languages, Literature and Social Sciences, a student must complete at least 12 graduate-level courses (36 credit hours), including at least five courses open only to graduate students, of which three must be at the 6000 level, with an overall minimum GPA of 3.0. A student must complete any prerequisite courses and all required courses, and the M.P.A. experiential learning requirement. The department of political science and public administration will grant credit toward the M.P.A. degree for certain courses taken in the College of Law, as detailed below.

M.A. in Political Science
The Master of Arts program is designed to help students become thoroughly grounded in the knowledge base and research methods of political science. The department offers study in four areas of the discipline:
• American government,
• comparative government,
• international relations, and
• political theory.

Requirements for admission are:
• a bachelor's degree from an accredited educational institution,
• acceptable scores on the GRE General Test, and
• three letters of recommendation from those in a position to judge the academic qualifications of the applicant.

Official results should be sent to the College of Graduate Studies. While the College of Graduate Studies allows a minimum undergraduate GPA of 2.7, those near this threshold should have demonstrated significant improvement in the last two years of their undergraduate work.

Those admitted to the M.A. program normally begin their study during the fall semester. Applications for admission and financial aid should be submitted by March 15, although applications for admission alone are welcome at any time.

Early Admission to M.A. in Political Science and Master of Public Administration Programs

Description
The Early Admission option allows advanced undergraduates with a major or minor in political science or public administration to enroll for graduate level credit in up to 9 hours of 4/5000 level classes. Students accepted in the Early Admission option receive both graduate and undergraduate credit for these classes; undergraduate instructional fees will apply to these three courses.

Eligibility
To be eligible for the Early Admission program, students must:
• have a major or minor in political science or public administration,
• be within one year of graduation,
• have a cumulative GPA of 3.3 or higher, and
• submit an application no earlier than three semesters prior to expected completion of the B.A. program.

Application Process
To apply for the Early Admission program, students should complete an Application for Early Admission (available from the Department of Political Science and Public Administration), submit three letters of recommendation (from an undergraduate advisor and two undergraduate course instructors), a one page biographical sketch, and a regular graduate application form to:

Chair of the Department of Political Science and Public Administration
MS 40
The University of Toledo
Toledo, OH 43606

Students accepted into this option will initially be granted provisional graduate admission to allow them to enroll in 5000-level courses in the Department of Political Science and Public Administration. 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 in Political Science and Public Administration may be included
• Must complete all graduate level requirements in the course and be evaluated by the same criteria as graduate students
• Must complete graduate plan of study indicating courses that will receive graduate and undergraduate credit

There are two options:
1. Thesis option
   a. 30 semester credit hours;
   b. Three seminars or lecture courses open only to graduate students: several 5000-level courses (3 hours) and any 6000-level course (3 hours each);
   c. A required master's thesis: PSC 6960 (6 hours); and
   d. Two courses (6 hours) may be taken outside of the department.

2. Non-thesis option
   a. Complete 33 semester credit hours.
   b. Create and submit a portfolio to the MA Committee for assessment. At a minimum this will include two seminar papers completed through their coursework. It will also include other work as decided by the student and her or his advisor.
   c. Complete and pass a comprehensive examination focused on the appropriate subfield of political science. The portfolio will be used by the committee to develop comprehensive examination questions.

The student may do an independent readings for credit toward their 33 credit hours as they prepare for the comprehensive examination. All planning for this alternative path must begin at the latest during the student’s third semester or equivalent thereof.

Up to 12 hours of credit may be taken outside of the department. It may also include up to six hours of internship credit. These must be approved by the program adviser or by the adviser of the individual student.

Academic Standards
M.A. students must maintain a minimum cumulative GPA of 3.0 overall and in their political science courses. Only those classes with a grade of C or higher may be counted toward the degree. A student receiving two grades below a B (i.e., of 2.67 or less) may be removed from the program.

Master of Public Administration
(Not accepting new applicants at this time)

The master of public administration (M.P.A.) 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.

Applicants to the M.P.A. program must satisfy the following requirements:
1. An undergraduate degree with a minimum GPA of 3.0 calculated on a 4.0 basis;
2. Scores from the GRE. A combined score of 1,000 (if taken before August 2011) or 300 (if taken in August 2011 or later) on the verbal and quantitative portions of the GRE is preferred, and the examination must have been taken in the past two years. With permission, the applicant may substitute scores for the Law School Admission Test (LSAT) or the Graduate Management Aptitude Test (GMAT);
3. Three or four 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 five years must submit at least two academic letters; and
4. A thoughtfully drafted statement of purpose.

Early Admission to M.A. in Political Science and Master of Public Administration Programs

Description
The Early Admission option allows advanced undergraduates with a major or minor in political science or public administration to enroll for graduate level credit in up to 9 hours of 4/5000 level classes. Students accepted in the Early Admission option receive both graduate and undergraduate credit for these classes; undergraduate instructional fees will apply to these three courses.

Eligibility
To be eligible for the Early Admission program, students must:

- have a major or minor in political science or public administration,
- be within one year of graduation,
- have a cumulative GPA of 3.3 or higher, and
- submit an application no earlier than three semesters prior to expected completion of the B.A. program.

Application Process
To apply for the Early Admission program, students should complete an Application for Early Admission (available from the Department of Political Science and Public Administration), submit three letters of recommendation (from an undergraduate advisor and two undergraduate course instructors), a one page biographical sketch, and a regular graduate application form to:

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- Only 5000-level courses in Political Science and Public Administration may be included
- Must complete all graduate level requirements in the course and be evaluated by the same criteria as graduate students
- Must complete graduate plan of study indicating courses that will receive graduate and undergraduate credit

(not accepting applications at this time)

Department of Psychology

Kim Gratz, Chair
Kamala London, Associate Chair
Jason Rose, Experimental Program Coordinator
Sarah Francis, Director of Clinical Training

Degrees Offered
- M.A. in Psychology (p. 38)
- PhD in Psychology (p. 38)

PSY 6000 History Of Psychology
[3 credit hours (3, 0, 0)]
Intensive historical treatment of the development of modern psychology from the 19th century. Theoretical psychological and related philosophical positions are emphasized.

PSY 6030 Research Practicum
[1-3 credit hours (0, 0, 0-3)]
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 (0, 0, 3)]
Supervised experience in the teaching of psychology. May be repeated for credit.

Term Offered: Fall

PSY 6050 Culture And Psychology
[3 credit hours (3, 0, 0)]
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 6100 Quantitative Methods In Psychology I
[3 credit hours (3, 0, 0)]
Probability theory, descriptive and inferential statistics, hypothesis testing, correlation.

Term Offered: Fall

PSY 6100 Quantitative Methods In Psychology II
[3 credit hours (3, 0, 0)]
Analysis of variance, regression analyses, non-parametric analyses.

Term Offered: Spring

PSY 6130 Design And Evaluation Of Psychological Research
[3 credit hours (3, 0, 0)]
Readings and discussion of problems of research design and analysis.

Term Offered: Fall
PSY 6150 Psychometrics and Scale Development
[3 credit hours (3, 0, 0)]
Procedures for developing and examining the reliability and validity of test scales, including theories of measurement, item analysis, factor analysis, and diagnostic efficiency statistics.
Prerequisites: PSY 6100 and PSY 6110
Term Offered: Spring

PSY 6200 Systems Of Personality
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Critical analysis of diagnostic classification models, etiological conceptualizations and therapeutic interventions form mental disorders.
Term Offered: Fall

PSY 6220 Cognitive Assessment
[4 credit hours (4, 0, 0)]
Assessment of cognitive functioning, utilizing tests of cognitive abilities and achievement.
Term Offered: Spring, Fall

PSY 6250 Seminar In Clinical Psychology
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 6310 Psychotherapy With Children And Adolescents
[3 credit hours (3, 0, 0)]
Presentation and explanation of techniques of psychotherapy with children and adolescents.
Prerequisites: PSY 6390
Term Offered: Fall

PSY 6330 Psychodynamic Psychotherapy
[3 credit hours (3, 0, 0)]
Didactic course covering psychoanalytic/psychodynamic theories, case conceptualization, therapy techniques, and relevant empirical research.
Term Offered: Spring, Fall

PSY 6340 Cognitive-Behavioral Psychotherapy
[3 credit hours (3, 0, 0)]
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 6350 Family And Couple Therapy
[3 credit hours (3, 0, 0)]
Presentation and exploration of family and couple therapy as a discipline, theoretical perspectives and empirical research on couple/family interaction and therapeutic techniques used with families and couples.
Prerequisites: PSY 6390
Term Offered: Fall

PSY 6390 Clinical Laboratory
[3 credit hours (0, 0, 3)]
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 (3, 0, 0)]
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 6500 Developmental Psychology
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Readings and evaluative discussions of the primary research literature in developmental psychology.
Prerequisites: PSY 6500
Term Offered: Spring, Fall

PSY 6600 Behavioral Neuroscience
[3 credit hours (3, 0, 0)]
Structure and function of neurons and the neural mediation of behavior, both normal and abnormal.
Term Offered: Summer

PSY 6610 Seminar In Psychobiology And Learning
[3 credit hours (3, 0, 0)]
Readings and evaluative discussions of the primary research literature in psychobiology, behavioral neuroscience, neuroanatomy, learning, motivation and perception.
Term Offered: Fall
PSY 6700 Social Psychology
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
In-depth treatment of selected topics in Social Psychology.
Term Offered: Spring, Fall

PSY 6810 Clinical Practicum I
[0 credit hours (0, 0, 0)]
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.
Prerequisites: PSY 6390
Term Offered: Spring, Fall

PSY 6820 Clinical Practicum II
[3 credit hours (0, 0, 3)]
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 6390
Term Offered: Spring, Fall

PSY 6830 Clinical Practicum III
[3 credit hours (0, 0, 3)]
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 6390 and PSY 6810 and PSY 6820
Term Offered: Spring, Fall

PSY 6840 Clinical Practicum IV
[1-3 credit hours (0, 0, 1-3)]
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 6390 and PSY 6810 and PSY 6820 and PSY 6830
Term Offered: Spring, Fall

PSY 6850 Family And Couple Practicum
[3 credit hours (0, 0, 3)]
Supervision of psychotherapy with families and couples seen through The University of Toledo Psychology Clinic.
Term Offered: Spring, Fall

PSY 6860 Advanced Assessment Practicum
[3 credit hours (3, 0, 0)]
Clinical supervision of psychological assessments using multiple methods of assessment with clients seen through The University of Toledo Psychology Clinic.
Prerequisites: PSY 6210 and PSY 6220 and PSY 6230
Term Offered: Spring, Fall

PSY 6930 Seminar In Psychology
[3 credit hours (3, 0, 0)]
Readings and evaluative discussions of the primary research literature in psychology.
Term Offered: Spring, Fall

PSY 6940 Supervised Clinical Practicum
[1-3 credit hours (0, 0, 0-3)]
Supervised applied assessment, therapeutic and consultative experience in community settings.
Term Offered: Summer, Fall

PSY 6950 Community Placement in Clinical Psychology
[0 credit hours (0, 0, 0)]
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 (0, 0, 0-3)]
Developing, conducting and analyzing the thesis research project, writing the thesis.
Term Offered: Spring, Summer, Fall

PSY 6980 Special Topics
[1-3 credit hours (0-3, 0, 0)]
Professional issues in academic and scientific psychology.
Term Offered: Spring, Summer, Fall

PSY 6990 Independent Study
[1-15 credit hours (0, 0, 0-15)]
Directed reading and/or experimentation on a topic selected by the study in conjunction with a faculty mentor.
Term Offered: Spring, Summer, Fall

PSY 7000 History Of Psychology
[3 credit hours (3, 0, 0)]
Intensive historical treatment of the development of modern psychology from the 19th century. Theoretical psychological and related philosophical positions are emphasized.

PSY 7030 Research Practicum
[1-3 credit hours (0, 0, 0-3)]
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 (0, 0, 3)]
Supervised experience in the teaching of psychology. May be repeated for credit.
Term Offered: Fall

PSY 7050 Culture And Psychology
[3 credit hours (3, 0, 0)]
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 7100 Quantitative Methods In Psychology I  
[3 credit hours (3, 0, 0)]  
Probability theory, descriptive and inferential statistics, hypothesis testing, correlation.  
Term Offered: Fall  
PSY 7110 Quantitative Methods In Psychology II  
[3 credit hours (3, 0, 0)]  
Analysis of variance, regression analyses, non-parametric analyses.  
Term Offered: Spring  
PSY 7130 Design And Evaluation Of Psychological Research  
[3 credit hours (3, 0, 0)]  
Readings and discussion of problems of research design and analysis.  
Term Offered: Fall  
PSY 7150 Psychometrics and Scale Development  
[3 credit hours (3, 0, 0)]  
Procedures for developing and examining the reliability and validity of test scales, including theories of measurement, item analysis, factor analysis, and diagnostic efficiency statistics.  
Prerequisites: PSY 7100 and PSY 7110  
PSY 7200 Systems Of Personality  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
Critical analysis of diagnostic classification models, etiological conceptualizations and therapeutic interventions form mental disorders.  
Term Offered: Fall  
PSY 7220 Cognitive Assessment  
[4 credit hours (4, 0, 0)]  
Assessment of cognitive functioning, utilizing tests of cognitive abilities and achievement.  
Term Offered: Spring, Fall  
PSY 7230 Personality Assessment  
[4 credit hours (4, 0, 0)]  
Assessment of personality functioning utilizing objective tests.  
Prerequisites: PSY 6220 or PSY 7220  
Term Offered: Spring  
PSY 7250 Seminar In Clinical Psychology  
[3 credit hours (3, 0, 0)]  
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: Summer, Fall  
PSY 7260 Professional And Ethical Issues  
[3 credit hours (3, 0, 0)]  
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 7310 Psychotherapy With Children And Adolescents  
[3 credit hours (3, 0, 0)]  
Presentation and explanation of techniques of psychotherapy with children and adolescents.  
Prerequisites: PSY 6390  
Term Offered: Spring  
PSY 7330 Psychodynamic Psychotherapy  
[3 credit hours (3, 0, 0)]  
Didactic course covering psychoanalytic/psychodynamic theories, case conceptualization, therapy techniques, and relevant empirical research.  
Prerequisites: PSY 7390  
Term Offered: Spring, Fall  
PSY 7340 Cognitive-Behavioral Psychotherapy  
[3 credit hours (3, 0, 0)]  
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 7350 Family And Couple Therapy  
[3 credit hours (3, 0, 0)]  
Presentation and exploration of family and couple therapy as a discipline, theoretical perspectives and empirical research on couple/family interaction and therapeutic techniques used with families and couples.  
Prerequisites: PSY 6390  
Term Offered: Fall  
PSY 7390 Clinical Laboratory  
[3 credit hours (0, 0, 3)]  
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 (3, 0, 0)]  
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 (3, 0, 0)]  
An advanced seminar focusing on selected topics from the general area of Cognitive Psychology.  
Term Offered: Spring  
PSY 7500 Developmental Psychology  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
Readings and evaluative discussions of the primary research literature in developmental psychology.  
Prerequisites: PSY 6500  
Term Offered: Spring, Fall
PSY 7600 Behavioral Neuroscience
[3 credit hours (3, 0, 0)]
Structure and function of neurons and the neural mediation of behavior, both normal and abnormal.
Term Offered: Summer

PSY 7610 Seminar In Psychobiology And Learning
[3 credit hours (3, 0, 0)]
Readings and evaluative discussions of the primary research literature in psychobiology, behavioral neuroscience, neuroanatomy, learning, motivation and perception.
Term Offered: Fall

PSY 7700 Social Psychology
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
In depth treatment of selected topics in Social Psychology.
Term Offered: Spring, Fall

PSY 7810 Clinical Practicum I
[0 credit hours (0, 0, 0)]
Supervision of psychotherapy with children and adolescents seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6390
Term Offered: Spring, Fall

PSY 7820 Clinical Practicum II
[3 credit hours (0, 0, 3)]
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 6390

PSY 7830 Clinical Practicum III
[3 credit hours (0, 0, 3)]
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 6390 and PSY 6810 and PSY 7810 and PSY 6820 and PSY 7820
Term Offered: Spring, Fall

PSY 7840 Clinical Practicum IV
[1-3 credit hours (0, 0, 1-3)]
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 6390 and PSY 6810 and PSY 7810 and PSY 6820 and PSY 7820 and PSY 6830 and PSY 7830
Term Offered: Spring, Fall

PSY 7850 Family And Couple Practicum
[3 credit hours (0, 0, 3)]
Supervision of psychotherapy with families and couples seen through the University of Toledo Psychology Clinic.
Term Offered: Spring, Fall

PSY 7860 Advanced Assessment Practicum
[3 credit hours (3, 0, 0)]
Clinical supervision of psychological assessments using multiple methods of assessment with clients seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 7210 and PSY 7220 and PSY 7230
Term Offered: Spring, Fall

PSY 7930 Seminar In Psychology
[3 credit hours (3, 0, 0)]
Readings and evaluative discussions of the primary research literature in psychology.
Term Offered: Spring, Fall

PSY 7940 Supervised Clinical Practicum
[1-3 credit hours (0, 0, 0-3)]
Supervised applied assessment, therapeutic and consultative experience in community settings.
Term Offered: Summer, Fall

PSY 7950 Community Placement in Clinical Psychology
[0 credit hours (0, 0, 0)]
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 (0-3, 0, 0)]
Professional issues in academic and scientific psychology.
Term Offered: Spring, Summer, Fall

PSY 7990 Independent Study
[1-15 credit hours (0, 0, 0-15)]
Directed reading and/or experimentation on a topic selected by the student in conjunction with a faculty mentor.
Term Offered: Spring, Summer, Fall

PSY 8940 APA Accredited Clinical Internship
[0-1 credit hours (0, 0, 0-1)]
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 (0, 0, 0-4)]
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,
- psychobiology and learning, or
- social psychology.

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<th>Code</th>
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<td>Core Requirements</td>
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<td>PSY 6100</td>
<td>Quantitative Methods in Psychology I</td>
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<td>Quantitative Methods in Psychology II</td>
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<td>PSY 6130</td>
<td>Design and Evaluation of Psychological Research</td>
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<td>Cognitive Psychology</td>
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<td>Research Requirements</td>
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<td>PSY 6960</td>
<td>M.A. Thesis</td>
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<td>Other</td>
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<td>Master’s thesis passed by thesis committee</td>
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Concentration Requirements

Select one of the following concentrations: 17

1. Clinical Core
   - PSY 6210 | Psychopathology  
   - PSY 6220 | Cognitive Assessment  
   - PSY 6230 | Personality Assessment
   - One psychotherapy didactic course (PSY 6310-6350)

2. Practicum
   - PSY 6390 | Clinical Laboratory  
   - PSY 6810 | Clinical Practicum I

Experimental Psychology

1. Seminars
   - Select two of the following: 2
     - PSY 6410 | Seminar in Cognitive Psychology  
     - PSY 6510 | Seminar in Developmental Psychology  
     - PSY 6610 | Seminar in Psychobiology and Learning  
     - PSY 6710 | Seminar in Social Psychology

PhD in Psychology

A minimum of 92 semester hours of course work is required in the Ph.D. program in psychology, 44 hours of core requirements, and a minimum of 48 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, psychobiology and learning, and social psychology.

Applicants must satisfy admission requirements of the College of Graduate Studies, the College of Languages, Literature, and Social Sciences, and the department. Each applicant must submit an application, transcripts of previous academic work, three letters of recommendation, and GRE scores. 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 adviser and advisory committee.

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<td>PSY 6200/7200</td>
<td>Systems of Personality</td>
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<td>PSY 6400/7400</td>
<td>Cognitive Psychology</td>
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**Research Requirements**

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<tr>
<td>PSY 8960</td>
<td>Phd Dissertation</td>
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**Concentration Requirements**

Select one of the following: 48

**Clinical Area**

1. Systems of Psychology
   - PSY 6260/7260 Professional And Ethical Issues

Select one of the following:
   - PSY 6050/7050 Culture And Psychology

2. Clinical Core
   - PSY 6210/7210 Psychopathology
   - PSY 6220/7220 Cognitive Assessment
   - PSY 6230/7230 Personality Assessment

Select at least one of the following:
   - PSY 6310/7310 Psychotherapy With Children And Adolescents
   - PSY 6330/7330 Psychodynamic Psychotherapy
   - PSY 6340/7340 Cognitive-Behavioral Psychotherapy
   - PSY 6350/7350 Family And Couple Therapy

3. Clinical Practica
   - PSY 6390/7390 Clinical Laboratory
   - PSY 6820 Clinical Practicum II
   - PSY 6830/7830 Clinical Practicum III
   - PSY 6840/7840 Clinical Practicum IV

4. Electives
   - Select 6 credits of electives in consultation with and with approval of the advisor

**Total Hours** 92

Students specializing in the clinical area must demonstrate broad and general exposure to the current body of knowledge and methods in each of these areas. If this is not done through these courses, it must be done through a seminar course or other activity at the graduate level with sufficient breadth. Students must take at least 3 courses from the previous list. Broad and general exposure to the other 2 core areas can be demonstrated by taking either graduate seminar courses through the Department or graduate courses elsewhere. Alternatives must be coordinated with the Faculty Mentor and approved by the DCT.

Students specializing in the clinical area must fulfill a History and Systems of Psychology requirement that is not regularly offered as a formal course in the Department. The program fulfills this history requirement—which is required by APA and most state licensing boards—by including the history and systems component across many of the required courses in our program—particularly PSY 6/7200 Systems of Personality. Therefore, a student entering with a Master’s degree and wishing to transfer a personality course may not be successful unless it emphasizes the history and systems of psychology. Similarly, students who might consider taking an alternative course option instead of PSY 6/7200 Systems of Personality would need to find an alternative that encompasses the history and systems of psychology.

To demonstrate mastery of the History and Systems of Psychology and Affective Aspects of Behavior DSK requirements, each student is required to compile a portfolio which will contain assignments (e.g., written paper, exam question, graded presentation) relevant to the History and Systems and Affective Aspects requirements that have been graded by the relevant course instructor from each of the following courses: History and Systems of Psychology courses: PSY 6/7200 Systems of Personality, PSY 6/7220 Cognitive Assessment, PSY 6/7230 Personality Assessment, PSY 6/7340 Cognitive-Behavioral Psychotherapy, PSY 6/7400 Cognitive Psychology, and PSY 6/7700 Social Psychology; Affective Aspects of Behavior courses: PSY 6/7200 Systems of Personality, PSY 6/7400 Cognitive Psychology, and PSY 6/7500 Developmental Psychology.
ANTH 5760 Medical Anthropology
[3 credit hours (3, 0, 0)]
An examination of the biocultural nature of health and illness.
Term Offered: Spring, Fall

ANTH 5860 The Irish-American Experience
[3 credit hours (0, 0, 3)]
A survey of the sociohistorical and cultural factors related to the immigration and adaptation of the Irish in America.

ANTH 5920 Directed Readings In Anthropology
[1-3 credit hours (0, 0, 0-4)]
Designed for those wishing to continue course work in greater depth or seeking contact with unlisted subject areas. Written proposal and consent required.

ANTH 5980 Problems In Anthropology
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-4)]
Supervised independent research in anthropology.
Term Offered: Spring

SOC 5040 Classical Theory
[3 credit hours (3, 0, 0)]
Term Offered: Fall

SOC 5100 Community Organizing And Development
[3 credit hours (3, 0, 0)]
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 5110 Political Sociology
[3 credit hours (0, 0, 3)]
Examination of political institutions, organizations and behavior with special attention to participation, power, ideology, decision making and conflict.

SOC 5160 Health And Gender
[3 credit hours (0, 0, 3)]
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: Summer, Fall

SOC 5170 Law And Society
[3 credit hours (3, 0, 0)]
Dynamics of law and legal institutions; the relationship of sociocultural changes in substantive and procedural aspects of law to the concept of justice, and to the social control of deviance.
SOC 5180 Medical Sociology
[3 credit hours (3, 0, 0)]
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 5190 Social Gerontology
[3 credit hours (3, 0, 0)]
A study of the changing proportions of older people in the population, their changing roles and statuses, and the problems and processes of adjustment.
SOC 5270 Social Research Methods
[3 credit hours (0, 0, 3)]
Introduction to procedures used in the various phases of sociological research.
Term Offered: Spring, Fall
SOC 5290 Social Research Statistics
[3 credit hours (0, 0, 3)]
Study of major statistical procedures and techniques in sociology.
Term Offered: Spring, Fall
SOC 5340 Population And Society
[3 credit hours (3, 0, 0)]
Examination of the interaction among variables of population (fertility, mortality and migration) and other aspects of societal organization.
Term Offered: Fall
SOC 5440 Methods Of Population Analysis
[3 credit hours (3, 0, 0)]
Methods of population analysis, including examination and evaluation of data sources.
SOC 5450 Exploring the City
[3 credit hours (0, 0, 3)]
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: Fall
SOC 5560 Fieldwork in Sociology
[6 credit hours (2, 0, 4)]
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 5580 Science, Technology, And Social Change
[3 credit hours (3, 0, 0)]
The impact of rapidly changing science and technology on North American society; social change in a technological age; the emergence of post industrial society.
SOC 5610 Sociology Of Organizations
[3 credit hours (0, 0, 3)]
Study of the structure and processes of organizations; includes theory of bureaucratic and non-bureaucratic organizations, as well as structure and function of organizations.
Term Offered: Spring
SOC 5650 ADVANCED TOPICS IN LATIN AMERICAN AND CARIBBEAN
[3 credit hours (3, 0, 0)]
An examination of social life in Latin America and the Caribbean, focusing on changing political economy, gender and ethnicity, globalization, culture and migration and in and out of the region.
Prerequisites: SOC 1010
SOC 5710 Criminology
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
Study of the analysis of the nature, meaning and process of deviant behavior in terms of social norms, control and societal reaction.
Term Offered: Summer
SOC 5740 Issues In Crime
[3 credit hours (0, 0, 3)]
Topics may include legalizing drugs, police violence, plea bargaining, death sentence and mandatory sentencing. Emphasizes liberal/conservative ideology.
SOC 5750 Legal Issues
[3 credit hours (3, 0, 0)]
Topics may include abortion, three strike sentencing, homosexual rights, hate speech and decriminalizing narcotics. Emphasizes liberal/conservative ideology.
SOC 5760 Juvenile Delinquency
[3 credit hours (0, 0, 3)]
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 5800 Development Of Subordinate Nations
[3 credit hours (3, 0, 0)]
The new emerging ideological, political, social and economic patterns which repeat themselves in and determine the Third World transition from a traditional to a new society.
Term Offered: Fall
SOC 5810 Gender In Cross-Cultural Perspective
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
This course will focus on social movements and their political context to understand the causes of social movement success and failure. Special attention will be given to the 1960s wave of protest, as well as to contemporary movement forms. Students will engage in intensive case study research applying the course concepts in addition to reading and writing on relevant topics.
Term Offered: Spring, Fall
SOC 5980 Special Topics In Sociology
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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
[1 credit hour (1, 0, 0)]
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: Fall

SOC 6040 Advanced Sociological Theory
[3 credit hours (3, 0, 0)]
Building on classical traditions, the course includes readings and lectures on functionalist, neo-Marxist, symbolic interactionist and other significant twentieth century sociological theories.
Prerequisites: SOC 4040 or SOC 5040
Term Offered: Fall

SOC 6050 Advanced Social Theory And Political Economy
[3 credit hours (0, 0, 3)]
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 or SOC 5040
Term Offered: Spring

SOC 6270 Advanced Social Research Methods
[3 credit hours (3, 0, 0)]
Examination of advanced methods of data collection in sociological research.
Prerequisites: SOC 5270
Term Offered: Spring, Fall

SOC 6290 Advanced Social Research Statistics
[3 credit hours (0, 0, 3)]
Examination of advanced methods of data analysis in sociological research.
Prerequisites: SOC 5290
Term Offered: Spring

SOC 6640 Seminar in Diversity and Inequality
[3 credit hours (0, 0, 3)]
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.
Term Offered: Spring

SOC 6800 Seminar In Theories In Social Psychology
[3 credit hours (3, 0, 0)]
Intensive sociological study of theory building in social psychology including, among others, paradigms of social cognition and belief, social influence, and social relations.

SOC 6900 Independent Research In Sociology
[1-3 credit hours (0, 0, 0-3)]
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 (0, 0, 3)]
Seminar on selected topics in the field of Sociology.
Term Offered: Spring, Fall

SOC 6940 Graduate Internship
[3 credit hours (0, 0, 9)]
In applied setting in areas of student interest: community organizing - health-probation - gerontology.
Prerequisites: (SOC 6040 or SOC 6050) and SOC 6270 and SOC 6290
Term Offered: Spring, Summer, Fall

SOC 6950 Thesis
[1-6 credit hours (0, 0, 1-6)]
Topic (proposal) is selected by the student and approved by a thesis committee.
Prerequisites: (SOC 6270 and SOC 6290 and SOC 6040 or SOC 6050)
Term Offered: Spring, Summer, Fall

SOC 6970 Master of Sociology Project
[1-6 credit hours (0, 0, 1-6)]
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
[1-6 credit hours (0, 0, 0-3)]
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

M.A. and Ed. in Sociology

Regular admission to the Master of Arts and Master of Arts and Education degree programs in Sociology requires meeting the admission requirements of the College of Graduate Studies, including presentation of scores on the aptitude sections of the GRE for any applicant with an undergraduate GPA below 2.7

M.A. in Sociology

Regular admission to the Master of Arts and Master of Arts and Education degree programs in Sociology requires meeting the admission requirements of the College of Graduate Studies, including presentation of scores on the aptitude sections of the GRE for any applicant with an undergraduate GPA below 2.7.

The Master of Arts in Sociology requires a minimum of 36 credit hours of study. These hours are made up of required courses in theory, methods, and statistics (see B below); elective course work (see C below); and completion of a thesis, an internship or additional course work (see D below).

The program requirements are:

M.A. and Ed. in Sociology

THE UNIVERSITY OF
TOLEDO
1872
A. Required Background Courses
For students who have not completed these or equivalent undergraduate courses:

- SOC 5040 Classical Theory
- SOC 5270 Social Research Methods
- SOC 5290 Social Research Statistics

B. Core Courses

- SOC 6040 Advanced Sociological Theory 3
  or SOC 6050 Advanced Social Theory And Political Economy 3
- SOC 6270 Advanced Social Research Methods 3
- SOC 6290 Advanced Social Research Statistics 3

C. Program Electives
Select courses from 5000- and 6000-level courses offered in sociology (See below) 12-21

D. Thesis/Internship/Course Work
Select one of the following (See below): 6
- Complete a thesis
- Complete an internship
- Select two additional courses

Program Electives
These courses may be completed by choosing from 5000- and 6000-level courses offered in sociology. Two courses must be Sociology seminar courses (e.g. SOC 6930). Students may use their elective hours to focus on a substantive area of the discipline, such as social inequality, disabilities, education, and community-based development towards electives.

Generally, students may take no more than six hours of independent study or research (SOC 5990, SOC 6900, SOC 6990) to complete their degree requirements. Also, students may apply no more than six hours taken outside the department toward completion of the degree requirements. Exceptions may be approved by the graduate adviser to a maximum of six hours.

Typically, students may apply no more than six hours taken outside the department toward completion of the degree requirements. Exceptions may be approved by the graduate committee.

Thesis/Internship/Course Work
Students may choose to complete a thesis, an internship, or an academic project. Each option will be graded on a S/U basis. The master’s thesis is an original piece of research developed in collaboration with a full-time member of the departmental faculty who serves as thesis committee chair. Two additional full-time faculty members (at least one of whom is a member of the departmental faculty) must also serve as advisers to the student and are members of the thesis committee.

Students selecting the internship must develop this option in concert with a full-time faculty member, the Sociology Director of Graduate Studies, and a person from the field in which the internship is located. Examples of internship settings include community organizations, health facilities, criminal justice facilities, and government offices. Internships must place students in a position to make sociological observations about the setting. Students should incorporate these observations in the work that they submit to the faculty advisor (e.g., journals, progress reports, papers).

The academic project is a rigorous investigation of a sociological topic or concept done in collaboration with a full-time member of the departmental faculty who serves as the advisor.

4+1 BA to MA in Sociology
Undergraduate students at the University of Toledo interested in pursuing a Master’s of Arts Degree in Sociology may apply for the 4+1 BA to MA in Sociology program option. If accepted, students are allowed to complete up to three graduate level classes (nine hours) during their final academic year of undergraduate studies. They will then continue in the 4+1 BA to MA in Sociology program upon completion of their undergraduate degree requirements.

In order to be accepted into this program, students must have: (1) a minimum 3.2 cumulative undergraduate grade point average (including credits transferred to UT); (2) undergraduate advisor’s approval; and (3) permission of the chair of each department in which graduate credit is desired.

Applied Social Research Certificate
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.

Department of World Languages and Cultures

Ruth A. Hottell, Chair
Ruth A. Hottell, French Graduate Adviser
An Chung Cheng, Spanish Graduate Adviser
Friederike Emonds, German Graduate Adviser

Degrees Offered
- M.A. and Ed with a Major in French, German or Spanish (p. 46)
- M.A. with a Major in French, German or Spanish (p. 46)
FREN 5010 Advanced French Stylistics I
[3 credit hours (3, 0, 0)]
A study of structural and stylistic principles of French with emphasis on various writing activities.
Term Offered: Spring, Fall

FREN 5020 Advanced French Stylistics II
[4 credit hours (0, 0, 4)]
A study of structural and stylistic principles of French with emphasis on various writing activities.
Term Offered: Spring

FREN 5050 Advanced Conversation
[3 credit hours (3, 0, 0)]
Intensive practice in speaking French.
Term Offered: Spring

FREN 5070 French Translation
[3 credit hours (3, 0, 0)]
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 Colloquium I
[3 credit hours (0, 0, 3)]
A course in the theory and practice of teaching French and of second language acquisition in general.
Term Offered: Fall

FREN 5190 Study Abroad
[1-12 credit hours (0, 0, 0-12)]
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 French-speaking country.

FREN 5200 Contemporary French And Francophone Civilization
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Course designed to develop sufficient reading proficiency to conduct and process research in French. (Not for majors)
Term Offered: Spring, Fall

FREN 5220 French For Reading Knowledge II
[3 credit hours (0, 0, 3)]
Course designed to develop sufficient reading proficiency to conduct and process research in French. (Not for majors)

FREN 5310 Medieval Studies
[3 credit hours (0, 0, 3)]
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 (3, 0, 0)]
Literature reflecting major currents of the Renaissance.
Term Offered: Spring, Fall

FREN 5510 17th Century French Literature
[3 credit hours (3, 0, 0)]
A study of the development of French Classicism.
Term Offered: Spring, Fall

FREN 5510 18th Century French Literature
[3 credit hours (3, 0, 0)]
Readings from the novels, plays and prose of the major writers of the Enlightenment.
Term Offered: Fall

FREN 5510 19th Century French Literature I
[3 credit hours (3, 0, 0)]
Literary and intellectual trends from Romanticism to Symbolism.

FREN 5510 Contemporary French & Francophone Literature I
[3 credit hours (3, 0, 0)]
Literature of all genres from the period before World War I to the present.
Term Offered: Spring, Fall

FREN 5580 Le Cinema Francais
[3 credit hours (0, 0, 3)]
A study of the development of French film and its place in world cinema.
Term Offered: Spring, Fall

FREN 5580 Special Topics In French Studies
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-1)]
Independent research in special topics. May be repeated once for additional credit.

GERM 5010 German Syntax And Stylistics I
[3 credit hours (3, 0, 0)]
A review of German stylistic structures through the analysis of texts and written and oral exercises.
Term Offered: Fall

GERM 5010 German Syntax And Stylistics II
[4 credit hours (4, 0, 0)]
Further review of German stylistic structures through the analysis of texts and written and oral exercises.
Prerequisites: GERM 5010
Term Offered: Spring
GERM 5160 Teaching Colloquium
[3 credit hours (0, 0, 3)]
A practical course in the theories, methods and specific techniques of teaching German. May be repeated once for additional credit.
Term Offered: Fall

GERM 5190 Study Abroad
[1-12 credit hours (0, 0, 0-3)]
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 (0, 0, 3)]
Study of major trends and current developments in German Landeskunde. May be repeated when topic varies.
Term Offered: Summer

GERM 5210 German For Reading Knowledge I
[3 credit hours (0, 0, 3)]
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 5260 German Classicism
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
Study of selected works by authors from Böckner to Fontane.
Term Offered: Spring

GERM 5720 German Romanticism
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 3)]
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 (0, 0, 0-3)]
Study of a selected topic in German language, literature, or culture. May be repeated for credit when topic varies.
Term Offered: Spring, Fall

GERM 5990 Independent Study In German
[1-3 credit hours (0, 0, 0-1)]
Independent research in special topics. May be repeated once for additional credit.
Term Offered: Spring, Fall

GERM 6900 Research In German
[1-3 credit hours (0, 0, 0-1)]
Independent research of a selected topic in German language, literature, or culture. May be repeated once for additional credit.
Term Offered: Spring, Summer

GERM 6930 Seminar: Selected Topics
[1-3 credit hours (0, 0, 0-3)]
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 (3, 0, 0)]
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 (4, 0, 0)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (4, 0, 0)]
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 (0, 0, 3)]
A practical course in the theories, methods and specific techniques of teaching Spanish.
Term Offered: Fall

SPAN 5160 Latin American Novel I
[3 credit hours (3, 0, 0)]
A study of the Latin American novel from the nineteenth century to the authors of the literary Boom of 1963.
Term Offered: Spring, Fall
SPAN 5170 Latin American Novel II  
[3 credit hours (3, 0, 0)]  
A study of the major developments in Latin American novel from the Boom to the present.  
Term Offered: Spring, Fall

SPAN 5210 Spanish For Reading Knowledge I  
[3 credit hours (3, 0, 0)]  
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 5220 Spanish For Reading Knowledge II  
[3 credit hours (3, 0, 0)]  
Study of those elements of structure and vocabulary most appropriate for preparing graduate students to read effectively in Spanish. (Not for majors)

SPAN 5250 Latin American Short Story  
[3 credit hours (3, 0, 0)]  
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 5310 Medieval & Renaissance Spanish Literature  
[3 credit hours (3, 0, 0)]  
Study of major works from the Poema de Mio Cid to the early writers of the Siglo de Oro.  
Term Offered: Spring

SPAN 5820 Modern Spanish Drama  
[3 credit hours (0, 0, 3)]  
Critical readings of Spanish drama from Romanticism to the latest contemporary trends.

SPAN 5830 Hispanic Cinema  
[3 credit hours (3, 0, 0)]  
Critical viewings of Spanish-language films from Spain and the Americas. Emphasis on cultural criticism.  
Term Offered: Spring

SPAN 5980 Special Topics  
[3 credit hours (3, 0, 0)]  
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 (0, 0, 0-1)]  
May be repeated for additional credit when topic varies.  
Term Offered: Spring, Summer, Fall

SPAN 6930 Seminar: Selected Topics  
[1-3 credit hours (0, 0, 0-3)]  
Selected topics from Spanish culture, linguistics, or literature.  
Term Offered: Spring, Fall

M.A. and Ed with a Major in French, German or Spanish

For the degree of Master of Arts and Education, students must meet requirements for the degree as stated in the Judith Herb College of Education (p. 299) graduate section of this catalog.

M.A. with a Major in French, German or Spanish

Students must complete a minimum of 30 semester credit hours for the master of arts and a minimum of 30 semester credit hours for the master of arts and education.

For the degree of master of arts or master of arts and education with a major in French, German or Spanish, students must meet the following departmental requirements:

- present an undergraduate major in the language of interest from an accredited college or university;
- satisfactorily complete at least 18 hours of graduate credit in the major language (including courses FREN 5010 and FREN 5020 or GERM 5010 and GERM 5020 in French and German, SPAN 5010 and SPAN 5110 in Spanish);
- satisfactorily complete an additional 12 hours in the major language or in approved, cognate courses;
- pass a comprehensive examination; and
- demonstrate a reading proficiency in a foreign language other than the major. This may be done either by earning a passing grade in a foreign language course at or above the 3000 level, by passing an examination administered by the Department of Foreign Languages, or by successfully completing a graduate reading course offered by the department.

A thesis may be presented for an additional six hours of credit in lieu of the comprehensive examination.

Department of Women’s and Gender Studies

Asma Abdel-Halim, Graduate Advisor

Degrees Offered

- Certificate Program in Women’s and Gender Studies (p. 47)

WGST 5880 Queer and Sexuality Theories-WAC  
[3 credit hours (0, 0, 3)]  
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 hyperabstraction of “classical theoretical” concepts/texts and their more “concrete” contextualized locations in communities and identities. This course focuses on the field that emerged from the GLBT movement as it moved into the academy in the 1990’s.  
Term Offered: Spring

M.A. and Ed with a Major in French, German or Spanish  46
WGST 5980 Special Topics Gender
[3 credit hours (3, 0, 0)]
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
[4 credit hours (0, 0, 4)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 1-4)]
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 (0, 0, 1-4)]
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

Certificate Program in Women’s and Gender Studies

The Graduate Certificate in Women's and Gender Studies is an interdisciplinary program of study which examines the significance and consequences of gender as a cultural category that shapes the experiences and knowledge of individuals and communities. Women's and Gender Studies is grounded in feminist and gender theories that re-conceptualize and re-contextualize ideas and experiences as well as knowledge and knowledge production. This field of study allows for an in-depth exploration of the sociocultural, economic, and political implications of gender, race, class, ability, sexuality, and power relations - past, present, and cross-culturally.

The goal of the Certificate program is to offer a formal program of study for graduate students who seek to include Women's and Gender Studies as a specific area of concentration in their graduate or professional studies.

The Certificate Program in Women's and Gender Studies is flexible and designed to accommodate both full-time and part-time graduate students. The courses required for the certificate include evening, hybrid and online courses.

Those applying to work on the certificate alone must be admitted to the Graduate School and submit an application form and letter of interest to the Department of Women's and Gender Studies. Those applying to complete the certificate as well as a Master's degree in another program should consult with that graduate adviser as well.

The Certificate consists of 15 hours of graduate study from the courses listed below and others as approved by the Graduate Advisor. Research & Methods is required of all students pursuing the Certificate.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>WGST 6240</td>
<td>Research and Methods in Women's and Gender Studies</td>
<td>15</td>
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<tr>
<td>WGST 6250</td>
<td>Feminism and U.S. Film</td>
<td></td>
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<tr>
<td>WGST 6260</td>
<td>Women, Gender &amp; Disability</td>
<td></td>
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<tr>
<td>WGST 5880</td>
<td>Queer and Sexuality Theories-WAC</td>
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<tr>
<td>WGST 5980</td>
<td>Special Topics Gender</td>
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<tr>
<td>WGST 6980</td>
<td>Directed Readings in Women's and Gender Studies</td>
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<tr>
<td>WGST 6990</td>
<td>Independent Project in WGST</td>
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<tr>
<td>Other related courses with the approval of the WGST Department Chair</td>
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</tbody>
</table>

Total Hours 15

Master of Liberal Studies

Jerry Van Hoy, Director

Degrees Offered
- Master of Liberal Studies Program (p. 48)

MLS 6010 MLS Seminar in Humanities
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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
Master of Liberal Studies Program

The Master of Liberal Studies (MLS) Program 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 MLS 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 MLS electives.

Recognizing the unique challenges facing non-traditional students, the MLS program attempts to provide course offerings in a variety of formats. The MLS degree may be completed via distance learning or on campus. For further information, please see the master of liberal studies web page at http://www.utoledo.edu/al/mls or contact the director at jerry.vanhoy@utoledo.edu.

A Certificate in Women's and Gender Studies is available through the Master of Liberal Studies program. See the Women's and Gender Studies (p. 46) section of this catalog for details.

All students seeking admission to the master of liberal studies program must file an application with the College of Graduate Studies. Application materials consist of an application, a statement of purpose, writing sample, post-secondary transcripts (not necessary for applicants with a UT degree), and three letters of reference. Students with an undergraduate GPA of less than 2.70 must also submit GRE scores to be considered for admission. Applicants may request or may be requested to have an interview with the director.

Early Admission to the Master of Liberal 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 Liberal Studies (MLS) program of the College of Arts and Letters. Students may then apply those courses and credit hours to both their BA and MLS degree requirements for graduation from The University of Toledo.

Undergraduate students accepted into the LS/MLS option will be admitted to the MLS program and allowed to complete three graduate level classes. They will then continue in the MLS program upon completion of the BA degree requirements. The nine hours of graduate course work will be applied to completion of both LS and MLS degree requirements. It will be the joint responsibility of staff in UC and MLS to supervise students admitted to the LS/MLS 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/MLS joint program.
2. Only MLS 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.

Master of Liberal Studies Program

The Master of Liberal Studies (MLS) Program 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 MLS 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 MLS electives.

Recognizing the unique challenges facing non-traditional students, the MLS program attempts to provide course offerings in a variety of formats. The MLS degree may be completed via distance learning or on campus. For further information, please see the master of liberal studies web page at http://www.utoledo.edu/al/mls or contact the director at jerry.vanhoy@utoledo.edu.

A Certificate in Women's and Gender Studies is available through the Master of Liberal Studies program. See the Women's and Gender Studies (p. 46) section of this catalog for details.

All students seeking admission to the master of liberal studies program must file an application with the College of Graduate Studies. Application materials consist of an application, a statement of purpose, writing sample, post-secondary transcripts (not necessary for applicants with a UT degree), and three letters of reference. Students with an undergraduate GPA of less than 2.70 must also submit GRE scores to be considered for admission. Applicants may request or may be requested to have an interview with the director.

Early Admission to the Master of Liberal 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 Liberal Studies (MLS) program of the College of Arts and Letters. Students may then apply those courses and credit hours to both their BA and MLS degree requirements for graduation from The University of Toledo.

Undergraduate students accepted into the LS/MLS option will be admitted to the MLS program and allowed to complete three graduate level classes. They will then continue in the MLS program upon completion of the BA degree requirements. The nine hours of graduate course work will be applied to completion of both LS and MLS degree requirements. It will be the joint responsibility of staff in UC and MLS to supervise students admitted to the LS/MLS 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/MLS joint program.
2. Only MLS 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.

Master of Liberal Studies Program

The Master of Liberal Studies (MLS) Program 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 MLS 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 MLS electives.

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2. Only MLS 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/MLS classes, or upper-level classes in the students’ proposed area of concentration at the graduate level.

The student and the MLS Graduate Adviser must develop an approved MLS 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/MLS early admission option.

For the master of liberal studies degree, students must complete the following requirements, totaling 33 hours of study:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLS 6010</td>
<td>MLS Seminar in Humanities</td>
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</tr>
<tr>
<td>MLS 6020</td>
<td>MLS Seminar In Social Sciences</td>
<td>3</td>
</tr>
<tr>
<td>MLS 6030</td>
<td>MLS Seminar In Natural Sciences</td>
<td>3</td>
</tr>
<tr>
<td>MLS 6040</td>
<td>MLS Seminar In The Visual And Performing Arts</td>
<td>3</td>
</tr>
<tr>
<td>MLS 6100</td>
<td>Interdisciplinary Research Methods</td>
<td>3</td>
</tr>
</tbody>
</table>

**Research Methods**

Research Methods course chosen in consultation with the director and an adviser

**Electives**

Courses chosen in consultation with the director and an advisor

**Capstone Requirement**

Capstone

**Thesis option:** 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:** 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.

**Spatially Integrated Social Science (SISS)**

**Degrees Offered**

- Ph.D. in Spatially Integrated Social Science (p. 50)

**SISS 7010 Spatial Statistics**

[3 credit hours (0, 0, 3)]

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:** Fall

**SISS 7020 GEOGRAPHICAL INFORMATION SCIENCE IN SISS**

[3 credit hours (0, 0, 3)]

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**

[4 credit hours (4, 0, 0)]

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 (0, 0, 3)]

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

**Term Offered:** Spring

**SISS 8030 ADVANCED SPATIAL DATA ANALYSIS**

[3 credit hours (0, 0, 3)]

Examination of spatial processes: spatial autoregressive models, gaussian Markov random field models, auto-logistic models, spatial discrete choice models. The topics include spatial panel data models, their applications and estimation methods.

**Prerequisites:** SISS 7010

**Term Offered:** Spring

**SISS 8040 Research Design**

[2 credit hours (2, 0, 0)]

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 and SISS 8020

**Term Offered:** Spring

**SISS 8150 ADVANCED QUALITATIVE ANALYSIS IN SISS**

[3 credit hours (0, 0, 3)]

Advanced qualitative analysis techniques and applications to a broad range of spatially oriented social science problems.

**Prerequisites:** SISS 7010 and SISS 7020 and SISS 8010

**SISS 8170 SPACE AND SOCIETY CRITICAL THEORY IN SISS**

[3 credit hours (0, 0, 3)]

Critical examination of both the role of spatial inquiry and its limitations to the understanding of society and space.

**Prerequisites:** SISS 7010 and SISS 7020 and SISS 8010

**Term Offered:** Spring
SISS 8180 DISCRETE CHOICE SPATIAL PROCESS MODELING
[3 credit hours (0, 0, 3)]
The study of the human factor in spatial processes with the aim to advance understanding of spatial aspects of social dynamics by modeling discrete choice spatial processes.
Prerequisites: SISS 7010 and SISS 7020 and SISS 8010

SISS 8200 SPATIAL PERSPECTIVES ON THE ENVIRONMENT
[3 credit hours (0, 0, 3)]
Examination of the relationship between SISS approaches and human interaction with the natural environment.
Prerequisites: SISS 7010 and SISS 7020 and SISS 8010
Term Offered: Spring, Fall

SISS 8920 Directed Readings in SISS
[3 credit hours (0, 0, 3)]
Independent study of research literature in Spatially Integrated Social Science and related fields.
Prerequisites: SISS 7010 and SISS 7020 and SISS 8010
Term Offered: Spring, Summer, Fall

SISS 8940 Seminar in Special Topics
[3 credit hours (0, 0, 3)]
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 and SISS 7020 and SISS 8010
Term Offered: Spring, Summer, Fall

SISS 8960 Doctoral Dissertation Research
[1-12 credit hours (0, 0, 1-12)]
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

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 College of Languages, Literature and Social Sciences 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 60 semester hours beyond the Master’s Degree with 36 course credits and 24 dissertation credits.

<table>
<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
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<tr>
<td>Mandatory Core Courses</td>
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<tr>
<td>SISS 7010</td>
<td>Spatial Statistics</td>
<td>3</td>
</tr>
<tr>
<td>SISS 7020</td>
<td>GEOGRAPHICAL INFORMATION SCIENCE IN SISS</td>
<td>3</td>
</tr>
<tr>
<td>SISS 8010</td>
<td>FOUNDATIONS OF SPATIALLY INTEGRATED SOCIAL SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>SISS 8020</td>
<td>SISS THEORY</td>
<td>3</td>
</tr>
<tr>
<td>SISS 8030</td>
<td>ADVANCED SPATIAL DATA ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>SISS 8040</td>
<td>Research Design</td>
<td>2</td>
</tr>
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</table>

Advanced Seminar Courses

Select two of the following: 6

<table>
<thead>
<tr>
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<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>SISS 8150</td>
<td>ADVANCED QUALITATIVE ANALYSIS IN SISS</td>
<td></td>
</tr>
<tr>
<td>SISS 8170</td>
<td>SPACE AND SOCIETY CRITICAL THEORY IN SISS</td>
<td></td>
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<tr>
<td>SISS 8180</td>
<td>DISCRETE CHOICE SPATIAL PROCESS MODELING</td>
<td></td>
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<tr>
<td>SISS 8200</td>
<td>SPATIAL PERSPECTIVES ON THE ENVIRONMENT</td>
<td></td>
</tr>
</tbody>
</table>

Elective Courses

Select two courses within an allied social science department 1 6

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SISS 8940</td>
<td>Doctoral Dissertation Research</td>
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</table>

Dissertation

<table>
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</thead>
<tbody>
<tr>
<td>SISS 8960</td>
<td>Doctoral Dissertation Research</td>
<td>24</td>
</tr>
</tbody>
</table>

Total Hours 60

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: Research Design).
during this time that the student should begin to focus on establishing a dissertation topic. A Qualifying Exam will be administered at the beginning 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. Upon completion of the qualifying exam, students will prepare a dissertation proposal and defend it by end of semester. Upon successful completion of the defense, each student will work on their dissertation for the remainder of Year 3 and up to Year 4.

Graduate Degrees/Certificates Offered

Links to respective web pages for more information

Humanities

- English (https://engl.utoledo.edu/english%20) (M)
- French (http://www.utoledo.edu/al/world-languages-and-cultures) (M)
- German (http://www.utoledo.edu/al/world-languages-and-cultures) (M)
- History (http://www.utoledo.edu/al/history) (M, PhD)
- Philosophy (http://www.utoledo.edu/al/philosophy) (M)
- Spanish (http://www.utoledo.edu/al/world-languages-and-cultures) (M)

School for Visual and Performing Arts

- Art (http://www.utoledo.edu/al/svpa/art) (M)
- Music (http://www.utoledo.edu/al/svpa/music) (M)

Interdisciplinary Studies

- Master of Liberal Studies (http://www.utoledo.edu/al/mls) (M)

Social Sciences

- Economics (http://www.utoledo.edu/al/econ) (M)
- Geography and Planning (http://www.utoledo.edu/al/geography) (M)
- Political Science and Public Administration (http://www.utoledo.edu/al/pspa) (M)
- Psychology (http://www.utoledo.edu/al/psychology) (M, PhD)
- Sociology (http://www.utoledo.edu/al/sa) (M)
- Spatially Integrated Social Sciences (http://www.utoledo.edu/al/siss) (PhD)

Graduate Certificate Programs

- Women’s and Gender Studies (http://www.utoledo.edu/al/wgst/grad_program.html)
- Health Care Policy & Administration (http://www.utoledo.edu/al/pspa/grad/certhca/certhca.html)
- Municipal Administration (http://www.utoledo.edu/al/pspa/grad/certma/certma.html)
- Management of NonProfit Organization (http://www.utoledo.edu/al/pspa/grad/certnonp/certnonp.html)
Established in 1930, the College of Business and Innovation of The University of Toledo is fully accredited by the American Assembly of Collegiate Schools of Business (AACSB). Among the diverse economic activities in metropolitan Toledo are retailing, financial services, and both large and small manufacturing firms. The Port of Toledo and many other enterprises makes Toledo an ideal place for the study of business.

Students can obtain practical experience through University and department-sponsored internships. Such programs enable students to apply skills and business theories to actual situations. In this and other ways, the business community becomes a laboratory for students and helps make the transition from the classroom to the world of work easier and more natural.

Mission
The 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.

We accomplish 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

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Phone: 419.530.2780

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Director, M.S. in Accounting Program
Stranahan Hall Room 3045
Phone: 419.530.4264

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Graduate Programs Office
Stranahan Hall Suite 10163130
Office: 419.530.5689

College Policies (Graduate Handbook)

COGS Graduate Student Handbook (http://www.utoledo.edu/graduate/files/Graduate%20Student%20Handbook%202015-2016.pdf)
- College Policies and Procedures (p. 392)
- Academic Regulations (p. 394)
- Other Policies and Information (p. 399)

Academic Policies
General Requirements
Refer to the general College of Graduate Studies (p. 392) 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.B.A. program is available in the Graduate Programs Office located in Stranahan Hall Suite 1016. Advising for the E.M.B.A., M.S.A. and Ph.D. programs is conducted by the respective program director. Students are encouraged to meet with an 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 confirm your degree program. The plan of study serves to define the students course of study, focus for degree, and constitutes an agreement
that successful completion will result in the awarding of the degree. Each student working toward a degree is required to file a plan of study with the College of Graduate Studies prior to the completion of 12 credit hours. It is the student’s responsibility to notify the College of Graduate Studies 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 may contain all of a student’s graduation requirements and assists with tracking student’s progress toward meeting those requirements. 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

Each year the College of Business and Innovation (COBI) offers Graduate Assistantships to a very small percentage of students with a history of academic excellence. Awards are based upon scholastic achievement, work experience, research experience and extracurricular activities. These awards are not based on financial need. Priority decisions for the academic year awards (Fall/Spring) are awarded to applicants who apply by the March 1st deadline date. Priority decisions for partial year awards (Spring) are awarded to applicants who apply by the October 1st deadline date.

Graduate Assistantships may include a tuition waiver for up to 9 credit hours for each Fall and Spring semesters. Most Graduate Assistantship awards do not cover Summer semesters. Students may submit a Graduate Assistantship application with their program application through the College of Graduate Studies or submit a Graduate Assistantship application to the Graduate Programs Office. Department of Accounting for M.S.A. students also accepts separate Graduate Assistantship applications. Graduate Assistantships are awarded to qualified Ph.D. students upon admission to the Ph.D. program.

Over the years, a myriad of generous donors have directed their philanthropic efforts toward the College of Business and Innovation. Many of the donations have been designated exclusively for scholarships for business students. As a result, the 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 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 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 the M.B.A. or M.S.A. 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.

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 College of Business and Innovation Code of Student Academic Conduct and the procedures for resolution of such issues in the College of Business and Innovation Student Academic Grievance Procedure. Procedural guidelines are located on the college’s web site.


College of Business and Innovation Student Academic Grievance Procedure:

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 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 readmission process. This fee is applied to the student account at the time the readmission process is completed.

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’s Students 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.

The College of Business and Innovation convocation ceremony is a more personal ceremony reserved for College of Business and Innovation students only. Convocation is held in Spring semester only. This is a ticketed event with limited guest seating. Students are expected to dress in academic regalia and will be individually recognized on stage.

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 have completed an undergraduate degree and 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 the quality of prior academic achievement, the Graduate Management Admissions Test (GMAT) scores, professional experience indicating increased levels of responsibility, and other relevant information that the candidate may share with the admissions committee.

The typical admitted student in the M.B.A. program has at least a 2.7 undergraduate GPA and 450 on the GMAT. However, for admission to the M.B.A. GMAT scores and undergraduate GPA will not be the sole basis for admissions decisions.

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) to the College of Graduate Studies. GMAT scores must be no more than five years old. For students applying to the J.D./M.B.A. dual degree program, the LSAT must have been taken within the last three years.
   a. GMAT Waivers
      i. Who is eligible for consideration for a GMAT waiver?
         1. COBI alumni applicants who graduated within the last three years with a competitive GPA (deemed competitive by COBI Graduate Programs Office and COBI Associate Dean).
         2. Non-COBI, yet AACSB accredited alumni applicants with significant, relevant, and progressive work experience (deemed acceptable by COBI Graduate Programs Office and COBI Associate Dean).
      ii. Inquirers must have completed the online application for enrollment in the term in which they are requesting the GMAT waiver.
      iii. The GMAT waiver will be valid for the term of admission per the online application.
         1. If the student does not enroll in the original term of admission, they may request that the COBI Graduate Programs Office re-evaluate their GMAT waiver request for the new term of admission.
      iv. This waiver does not apply to graduate assistantships.
         Applicants who want to be considered for a graduate assistantship, must take the GMAT and score 500 or higher.
      v. This waiver does not apply to the MSA, EMBA, or global MBA programs.
3. At least one letter of reference from individuals who know the applicant in a professional capacity.
4. The statement of purpose as required on the application for admission.

Admissions Policies
In the case of students whose native language is not English, a score of at least 550 (paper based), 213 (computer based), or 80 (internet based) on the Test of English as a Foreign Language (TOEFL) or a 6.5 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:**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall semester</td>
<td>August 1</td>
</tr>
<tr>
<td>Spring semester</td>
<td>November 15</td>
</tr>
<tr>
<td>Summer semester</td>
<td>April 15</td>
</tr>
</tbody>
</table>

**International students:**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall semester</td>
<td>May 1</td>
</tr>
<tr>
<td>Spring semester</td>
<td>October 1</td>
</tr>
<tr>
<td>Summer semester</td>
<td>March 1</td>
</tr>
</tbody>
</table>

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. The LSAT will be accepted by the College of Business and Innovation in lieu of GMAT scores.

Admission to one program does not guarantee admission to the other program. Refer to the College of Law (p. 189) 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. The MCAT will be accepted by the College of Business and Innovation in lieu of GMAT scores.

Admission to one program does not guarantee admission to the other program. Refer to the College of Medicine and Life Sciences (p. 191) 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 Medicine and Life Sciences and the College of Business and Innovation separately to be admitted to the MPH/M.B.A dual degree program. If the applicant is required to take the GRE by the MPH Admission Committee, the College of Business and Innovation will accept GRE scores in lieu of the GMAT. If the applicant does not need to take the GRE for admission to the MPH program, the applicant must then take the GMAT examination for admission to the M.B.A. Program.

Admission to one program does not guarantee admission to the other program. Refer to the College of Medicine and Life Sciences (p. 191) 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. The PCAT will be accepted by the College of Business and Innovation in lieu of GMAT scores.

Admission to one program does not guarantee admission to the other program. Refer to the College of Pharmacy and Pharmaceutical Science (p. 280) 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 will take the GMAT at the end of their junior year and 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, score a minimum of 450 on the GMAT, and have at least a 3.0 cumulative GPA. Undergraduate requirements for the general business minor 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 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. Official GMAT scores sent directly from the Graduate Management Admissions Council (GMAC) to the College of Graduate Studies. The GMAT scores must be no more than five years old.
3. A current resume to allow the Admissions Committee the opportunity to assess the individual's work experience.
4. Employer nomination form and two letters of recommendation from individuals who know the applicant in a professional capacity, one of which must be from the applicant’s employer. The employer nomination form must be completed by someone other than those completing the letters of recommendation. Self-employed applicants may substitute the employer nomination with a third professional reference.
5. In the case of students whose native language is not English, a score of at least 550 (paper based), 213 (computer based), or 80 (internet based) on the Test of English as a Foreign Language (TOEFL) is mandatory. The TOEFL can be waived for applicants with sufficient supervisory experience. The TOEFL can be waived for applicants who are permanent residents and have worked in the US for more than one year provided the E.M.B.A. Admissions Committee determines the applicants' language proficiency. If an applicant to the E.M.B.A. program is on an F1 or J1 visa, they must provide passing TOEFL or IELTS scores unless there is evidence of an earned US degree.

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 Master of Science in Accountancy (M.S.A.) Program

All decisions regarding admissions to the M.S.A. program are made through the office of the director of graduate programs in accounting. Admission to the M.S.A. program is available for those students who demonstrate high promise of success in a graduate program. All applicants are considered on the basis of their merit with weight given to the quality of prior academic achievement, GMAT test scores, professional experience, and other relevant information. 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) to the College of Graduate Studies. The minimum GMAT score is 500, must be no more than five years old.
3. The GMAT may be waived for applicants who have earned:
   a. An undergraduate degree from UT (minimum 3.0 GPA) within the last ten years, or MBA or
   b. A masters in economics (minimum 3.00 GPA) within the last ten years, or
   c. An active practicing CPA/CMA, or passed the CPA/CMA exam within the last five 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).

In the case of students whose native language is not English, a score of at least 550 (paper based), 213 (computer based), or 80 (internet based) on the Test of English as a Foreign Language (TOEFL) or a 6.5 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.S.A. program admits students to the program on a rolling admissions basis.

Admission to Doctor of Philosophy in Manufacturing and Technology Management (Ph.D.) Program

No new students are being accepted into this program at the present time.

Applicants with a master's degree in a technical field or business are preferred. Applicants with a bachelor's degree in a technical field or business may also be considered. Letters of reference from college faculty or employers acquainted with the student's character and ability, and official transcripts of all prior college work must be supplied.
Applicants are expected to demonstrate preparation for, and a high promise of, success in the doctoral program.

The following will be considered in evaluating an application to the Ph.D. program on an individual basis:

- The student’s undergraduate and graduate record with general academic performance, as well as the trend and comparison of grades over a period of time;
- The student’s verbal, quantitative and total scores on the GMAT (in certain cases, depending on the academic background of the student, GRE scores may be substituted for GMAT scores);
- Evidence of the ability to do research (publications, presentations, etc.);
- Statement of purpose explaining why the student wants to pursue a Ph.D. in manufacturing and technology management;
- Three letters of reference;
- Appropriate experience;
- And, in the case of students whose native language is not English, acceptable performance on the TOEFL or IELTS is mandatory.

It is to be stressed that, although GMAT and GPA are important, they alone will not be the basis of admissions decisions. While students may come from many academic disciplines, those students with bachelor’s degrees in fields other than business may require more than 93 semester hours in order to satisfy prerequisite and business foundations course requirements. Students admitted to the Ph.D. program will not receive graduate credit for any undergraduate courses they take.

A student should take the Ph.D. comprehensive examination as soon as he/she and his/her adviser believes the student has mastered all the required subject areas and completed all course work. The format and other details of the examination are given in the handbook for Ph.D. students and are available on-line. Following successful completion of the comprehensive examination, the student is admitted to candidacy for the Ph.D. and undertakes dissertation research. The student is responsible for initiating the application to candidacy on a form available from the College of Graduate Studies.

When a student enters the program, the Ph.D. program director will help the student in preparing a plan of study. Each student will be assigned a faculty adviser by the Ph.D. program director at the time of admission. During this first year of study, the student will choose an adviser who will assist the student in choosing a dissertation topic, forming a dissertation committee and in other matters concerning the program. More information is available at: http://www.utoledo.edu/business/PHD/index.html.

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.)
The M.B.A. degree is granted to students who satisfactorily complete a minimum of 33 semester hours at the 6000-level in the 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 (18 hours), core (24 hours) and elective (9-12 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.

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 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.

Doctor of Philosophy in Manufacturing and Technology Management (Ph.D.)
The program requires at least 93 semester hours of study beyond the baccalaureate. For a full-time student with only a bachelor’s degree, the course requirements before entering the dissertation stage can be completed in three years. Full-time students with an M.B.A. or a relevant M.S. degree should be able to complete the course work in two years before entering the dissertation stage. During the first year, the students without prior appropriate undergraduate or graduate work in business or engineering will acquire the foundation knowledge in business, engineering and manufacturing technology. Course waivers are possible at the foundation stage by passing competency examinations in appropriate areas.

Departments
- Department of Accounting (p. 57)
- Department of Finance (p. 61)
- Department of Information Operations & Technology (p. 62)
- Department of Management (p. 65)
- Department of Marketing and International Business (p. 81)
- Dual Degrees (p. 84)

Department of Accounting
Hassan Hassab Elnaby, Chair
Admission to Master of Science in Accountancy (M.S.A.) Program

All decisions regarding admissions to the M.S.A. program are made through the office of the director of graduate programs in accounting. Admission to the M.S.A. program is available for those students who demonstrate high promise of success in a graduate program. All applicants are considered on the basis of their merit with weight given to the quality of prior academic achievement, GMAT test scores, professional experience, and other relevant information. 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) to the College of Graduate Studies. The minimum GMAT score is 500, must be no more than five years old.*
3. The GMAT may be waived for applicants who have earned:
   a. An undergraduate degree from UT (minimum 3.00 GPA) within the last ten years, or MBA or master in economics (minimum 3.00 GPA) within the last ten years, or
   b. A masters in economics (minimum 3.00 GPA) within the last ten years, or
   c. An active practicing CPA/CMA, or passed the CPA/CMA exam within the last five 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).

In the case of students whose native language is not English, a score of at least 550 (paper based), 213 (computer based), or 80 (internet based) on the Test of English as a Foreign Language (TOEFL) or a 6.5 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:**

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**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 GMAT may be waived for applicants who have earned a:
   1. BBA from UT (minimum 3.00 GPA) within the last ten years, or
   2. MBA or master in economics (minimum 3.00 GPA), or
   3. Active CPA/CMA. Or passed the CPA/CMA exam within the last ten years

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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 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.

**Degrees Offered**

- MSA Accounting (p. 59)

**ACCT 5000 Financial And Managerial Accounting**

[3 credit hours (3, 0, 0)]

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 5120 External Financial Reporting II**

[3 credit hours (3, 0, 0)]

This class concentrates on financial accounting for corporations and emphasizes the liability and owner’s equity sections of the balance sheet and related income statement issues.

**Prerequisites:** ACCT 3110

**Term Offered:** Spring, Summer, Fall

**ACCT 5320 Internal Reporting**

[3 credit hours (3, 0, 0)]

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.

**Prerequisites:** ACCT 3110

**Term Offered:** Spring, Summer, Fall

**ACCT 5420 Auditing**

[3 credit hours (3, 0, 0)]

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 5120 or ACCT 3120 and ACCT 3310

**Term Offered:** Spring, Summer, Fall

**ACCT 5940 Internship**

[1-3 credit hours (0, 0, 0-3)]

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 External Financial Reporting III

[3 credit hours (3, 0, 0)]
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 or ACCT 5120  
**Term Offered:** Spring, Fall

### ACCT 6150 International Accounting And Taxation

[3 credit hours (3, 0, 0)]
Analysis of accounting issues crucial to multinational companies. Issues to be addressed include: comparing accounting across countries, effects of harmonization of financial reporting requirements and the translation of foreign currency financial statements.
**Prerequisites:** ACCT 6210 (may be taken concurrently)  
**Term Offered:** Spring, Fall

### ACCT 6190 Contemporary Accounting Problems

[3 credit hours (3, 0, 0)]
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 6210 and ACCT 6130)  
**Term Offered:** Spring, Summer, Fall

### ACCT 6210 Research In Accounting And Taxation

[3 credit hours (3, 0, 0)]
Provides the methodology necessary for accountants to perform effective, efficient and ethical accounting and tax research and the means of communicating those results.
**Prerequisites:** ACCT 3120 or ACCT 5120 and ACCT 3210  
**Term Offered:** Spring, Fall

### ACCT 6250 Corporate Taxation

[3 credit hours (3, 0, 0)]
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 and ACCT 5120 or ACCT 3120  
**Term Offered:** Spring, Summer, Fall

### ACCT 6310 Advanced Managerial Accounting

[3 credit hours (3, 0, 0)]
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 or ACCT 5320  
**Term Offered:** Summer, Fall

### ACCT 6330 Advanced Topics In Accounting Information Systems

[3 credit hours (3, 0, 0)]
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  
**Term Offered:** Spring, Fall

### ACCT 6410 Governmental And Not-For-profit Accounting

[3 credit hours (3, 0, 0)]
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 or ACCT 5120  
**Term Offered:** Spring, Fall

### ACCT 6430 Business Valuation And Analysis

[3 credit hours (3, 0, 0)]
Analyzes business analysis and valuation techniques with major emphasis placed on how a firm’s financial reporting decisions affect fundamental analysis.
**Prerequisites:** ACCT 3120 or ACCT 5120  
**Term Offered:** Spring, Fall

### ACCT 6440 Advanced Auditing

[3 credit hours (2, 0, 1)]
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 or ACCT 5420  
**Term Offered:** Spring, Fall

### ACCT 6450 Fraud and Forensic Accounting

[3 credit hours (2, 1, 0)]
This course is designed to introduce the student to the basic concepts of Fraud Examination and Forensic Accounting.
**Prerequisites:** ACCT 4420 or ACCT 5420  
**Term Offered:** Spring, Summer

### ACCT 6960 Independent Study In Accounting

[1-3 credit hours (0, 0, 0-3)]
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

### MSA Accounting

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.

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>Accounting Core Courses</strong></td>
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</tr>
<tr>
<td>ACCT 6130</td>
<td>External Financial Reporting III</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 6190</td>
<td>Contemporary Accounting Problems</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 6210</td>
<td>Research In Accounting And Taxation</td>
<td>3</td>
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<tr>
<td>OSCM 6250</td>
<td>Essentials of Business Analytics</td>
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<td><strong>GENERAL MSA</strong></td>
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<tr>
<td>ACCT 6150</td>
<td>International Accounting And Taxation</td>
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<td>ACCT 6250</td>
<td>Corporate Taxation</td>
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</table>
ACCT 6310 Advanced Managerial Accounting
ACCT 6330 Advanced Topics In Accounting Information Systems
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 6960 Independent Study In Accounting

Business Electives - 6 hours (2 courses):
Two graduate business courses.
BUAD 6200 Financial Systems
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

SPECIALIZED MSA TRACKS 3

AUDITING & IT TRACK 3
Accounting Electives (12 hours) - Choose 4 courses from the following:
ACCT 6410 Governmental And Not-For-profit Accounting
ACCT 6440 Advanced Auditing
ACCT 6450 Fraud and Forensic Accounting
ACCT 6330 Advanced Topics In Accounting Information Systems
ACCT 6960 Independent Study In Accounting

Business Electives (6 hours) - Choose 2 courses from the following:
INFS 6150 Business Intelligence Management
INFS 6610 Information Storage And Retrieval Structures
INFS 6710 Management of Information Systems Security

FINANCIAL REPORTING AND FINANCE TRACK 3
Accounting Electives (12 hours) - Choose 4 courses from the following:
ACCT 6150 International Accounting And Taxation
ACCT 6250 Corporate Taxation
ACCT 6310 Advanced Managerial Accounting
ACCT 6410 Governmental And Not-For-profit Accounting
ACCT 6430 Business Valuation And Analysis
ACCT 6960 Independent Study In Accounting

Business Electives (6 hours) - Choose 2 courses from the following:
BUAD 6200 Financial Systems
FINA 6130 Advanced Corporate Finance
FINA 6140 Investments And Security Analysis
FINA 6340 Derivative Securities

STRATEGIC MANAGERIAL ACCOUNTING AND OPERATIONS MANAGEMENT TRACK 3
Accounting Electives (12 hours) - Choose 4 courses from the following:
ACCT 6150 International Accounting And Taxation

ACCT 6310 Advanced Managerial Accounting
ACCT 6330 Advanced Topics In Accounting Information Systems
ACCT 6410 Governmental And Not-For-profit Accounting
ACCT 6430 Business Valuation And Analysis
ACCT 6960 Independent Study In Accounting

Business Electives (6 hours) - Choose 2 courses from the following:
BUAD 6200 Financial Systems
BUAD 6600 Supply Chain Management
INFS 6150 Business Intelligence Management
OSCM 6680 Quality Management and Six Sigma
OSCM 6690 Supply Chain Resources Management

Total Hours 12

1 ACCT 4130 at the undergraduate level
2 MSA 4 Core courses (12 hours) above required for all MSA students.
3 MSA Elective courses for the "General MSA" and the "Specialized MSA Tracks": 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 Adviser. 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 MSA Program Adviser.

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. Undergraduate equivalents are below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 5000</td>
<td>Financial And Managerial Accounting 1</td>
<td>3</td>
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<tr>
<td>ACCT 3110</td>
<td>Intermediate Financial 1</td>
<td>4</td>
</tr>
<tr>
<td>ACCT 3120/5120</td>
<td>Intermediate Financial 2</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 3210</td>
<td>Individual Taxation</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 3310</td>
<td>Accounting Information Systems And Controls</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 3320/3320</td>
<td>Cost Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 4420/5420</td>
<td>Auditing</td>
<td>3</td>
</tr>
<tr>
<td>FINA 5210</td>
<td>Economics For Business Decisions 2</td>
<td>3</td>
</tr>
<tr>
<td>FINA 5310</td>
<td>Managerial Finance 3</td>
<td>3</td>
</tr>
</tbody>
</table>
FINA 5210 Economics For Business Decisions
[3 credit hours (3, 0, 0)]
This course is designed for students with little or no prior formal economic education. The course consists of two distinct halves—microeconomics and macroeconomics. The former deals with economic behavior at disaggregated levels; the individual, firm, and industry levels. The macroeconomics portion deals with economic behavior and policy making at the highest level of aggregation topics include unemployment, inflation, and economic growth and related government and quasi-governmental institutions.

Term Offered: Spring, Summer, Fall

FINA 5310 Managerial Finance
[3 credit hours (3, 0, 0)]
This course is designed to develop the skills necessary to understand how financial managers make value-maximizing decisions in their organization. Contents include fundamentals of financial analysis, short and long-term investments, time value of money, stock and bond valuation, risk and return, and corporate structure.

Prerequisites: ACCT 5000 or BUAD 2040 and BUAD 2050 or ACTG 1040 and ACTG 1050

Term Offered: Spring, Summer, Fall

FINA 6130 Advanced Corporate Finance
[3 credit hours (3, 0, 0)]
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

Term Offered: Spring, Summer, Fall

FINA 6140 Investments And Security Analysis
[3 credit hours (3, 0, 0)]
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: BUAD 6200

Term Offered: Summer, Fall

FINA 6150 Financial Institutions And Markets
[3 credit hours (3, 0, 0)]
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: BUAD 6200

Term Offered: Spring, Fall

FINA 6340 Derivative Securities
[3 credit hours (3, 0, 0)]
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: BUAD 6200

Term Offered: Spring

FINA 6370 MBA International Financial Management
[3 credit hours (3, 0, 0)]
Techniques and theory of financial management in an international environment. The role of international markets in risk reduction and profit maximization are emphasized.

Prerequisites: BUAD 6200

Term Offered: Summer, Fall

FINA 6480 Student Managed Portfolio
[3 credit hours (0, 0, 3)]
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 responsibilities.

Prerequisites: BUAD 6200

Term Offered: Spring, Fall

FINA 6750 Research In Finance
[1-3 credit hours (0, 0, 0-3)]
This course fulfills the need for students who would like to do research on specific area of finance supervised by a faculty member.

Prerequisites: BUAD 6200

Term Offered: Spring, Summer, Fall

MBA Finance
Common Body of Knowledge

These courses represent the minimum background required of students prior to taking 6000-level courses in the M.B.A. program. Students admitted to the M.B.A. program can meet the requirements by taking the 5000-level courses or by proficiency examination. If a student can demonstrate that he/she has 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.
Department of Information Operations & Technology

M.B.A. Core
(24 hours)

These courses are required of all students. They are reflective of business techniques, methodology and processes, and are designed to be cross-functional and integrative.

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</tr>
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<td>3</td>
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<td>OSCM 5510</td>
<td>Business Statistics With Computer Applications</td>
<td>3</td>
</tr>
<tr>
<td>OSCM 5520</td>
<td>Analysis of Manufacturing and Service Systems</td>
<td>3</td>
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<tr>
<td>Total Hours</td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

Elective Courses
(Minimum 9 hours)

Each student may select up to two majors. An alternative is to select the general administration major described below, which is designed for students who prefer to take a variety of electives in different areas. The substitution of any courses for a major requires the written approval of the appropriate Department Chair. No more than one independent study/research paper (three hours) may be taken in lieu of a course to fulfill a specialization requirement, and no more than one course will be allowed to count towards two majors in the M.B.A. program.

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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Select three of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FINA 6130</td>
<td>Advanced Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>FINA 6140</td>
<td>Investments And Security Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours 9

Department of Information Operations & Technology

P. Sundararaghavan, Interim Chair

Degrees Offered

- MBA Information Systems (p. 63)
- MBA Operations and Supply Chain Management (p. 64)

INFS 6150 Business Intelligence Management
[3 credit hours (3, 0, 0)]

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.

INFS 6460 Management Information Systems
[3 credit hours (3, 0, 0)]

This course is designed for end-users of computers to understand and appreciate the role of information technology and end-user’s role in the management of this technology in organizations.

INFS 6560 Systems Analysis And Design
[3 credit hours (3, 0, 0)]

Concepts, tools, and techniques for information systems analysis, design and development will be discussed. Contemporary methodologies for systems development including CASE tools, prototyping and RAD project work will be included.

Prerequisites: BUAD 6800

Term Offered: Spring, Summer, Fall

INFS 6610 Information Storage And Retrieval Structures
[3 credit hours (3, 0, 0)]

This course will analyze the concepts and methods used in the management of organizational data resources. Covers data modeling, database design, administration and architecture. Hands-on applications of database development are provided.

Term Offered: Spring

INFS 6710 Management of Information Systems Security
[3 credit hours (3, 0, 0)]

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.

INFS 6750 Research In Information Systems, Operations Management Or Decision Sciences
[1-3 credit hours (0, 0, 0-1)]

Individual study of topics of common interest to both student and faculty member.

Term Offered: Spring, Summer, Fall
INFS 6780 ERP Systems Process Management  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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 (3, 0, 0)]  
Applications of business data communication, basic electronic communications concepts, public networks, computer networks, the Internet, network management, regulatory environment.

Term Offered: Spring

INFS 6830 Contemporary Topics Seminar  
[3 credit hours (3, 0, 0)]  
This seminar will focus on current topics in the fields of Information Systems and Operations Management.

Term Offered: Spring, Fall

INFS 6850 Business Intelligence Management  
[3 credit hours (3, 0, 0)]  
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.

INFS 6860 Management Information Systems  
[3 credit hours (3, 0, 0)]  
This course is designed for end-users of computers to understand and appreciate the role of information technology and end-user's role in the management of this technology in organizations.

INFS 6880 Information Systems Issues In Manufacturing  
[4 credit hours (4, 0, 0)]  
This course examines theoretical frameworks and recent empirical research of information and manufacturing technology. Emphasis will be on developing an integrative perspective of both technologies.

INFS 6890 Management of Information Systems Security  
[3 credit hours (3, 0, 0)]  
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

INFS 8760 IS Research Seminar I  
[3 credit hours (0, 0, 3)]  
This course covers the full spectrum of IS research on technology adoption models and the adoption and diffusion of innovations in information technology. We examine the Technology Acceptance Model, TAM II, the Unified Theory of the Acceptance and Use of Technology and UTAUT 2. We also examine the literature on technology acceptance beyond the dominant paradigm of technology acceptance.

INFS 8770 IS Research Seminar II  
[3 credit hours (0, 0, 3)]  
This course covers the rich vein of IS research that falls outside the Technology Acceptance Model or quantitative positivist research genre. These include examining questions of IT strategy and the value of IT to business firms. The value of IT to the organization has been approached using various theoretical lenses.

INFS 8930 Contemporary Topics Seminar-Outsourcing  
[3 credit hours (3, 0, 0)]  
The course will address issues in planning for, implementing and managing or just working in, outsourcing projects. PhD. students enrolled in 8930 will be assigned additional readings and required to complete a research paper.

Term Offered: Spring, Fall

INFS 8990 Integrative Seminar in IT  
[3 credit hours (3, 0, 0)]  
The seminar will investigate managerial issues in the field of information systems and technology management.

Term Offered: Spring, Summer, Fall

OPMT 6510 Project Management  
[3 credit hours (3, 0, 0)]  
This course deals with managing of projects in research and development, manufacturing, construction and service organizations. Students will discuss cases and use extensively a project management software.

Prerequisites: OPMT 5520 or BUAD 3020

Term Offered: Fall

**MBA Information Systems**  
**Common Body of Knowledge**  
(18 hours maximum)

These courses represent the minimum background required of students prior to taking 6000-level courses in the M.B.A. program. Students admitted to the M.B.A. program can meet the requirements by taking the 5000-level courses or by proficiency examination. If a student can demonstrate that he/she has 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 toward credit for 5000-level requirements.

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<td>Economics For Business Decisions</td>
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</table>
M.B.A. Core
(24 hours)

These courses are required of all students. They are reflective of business techniques, methodology and processes, and are designed to be cross-functional and integrative.

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<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>BUAD 6100</td>
<td>Accounting For Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6200</td>
<td>Financial Systems</td>
<td>3</td>
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<tr>
<td>BUAD 6300</td>
<td>Strategic Marketing And Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6400</td>
<td>Results-Based Management</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6500</td>
<td>International Business</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6600</td>
<td>Supply Chain Management</td>
<td>3</td>
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<td>BUAD 6800</td>
<td>Information Technology And E-Business</td>
<td>3</td>
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<tr>
<td>BUAD 6900</td>
<td>Strategic Management Capstone</td>
<td>3</td>
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</tbody>
</table>

Total Hours 24

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 core class with an M.B.A. elective of their choice.

Elective Courses
(Minimum 9 hours)

Each student may select up to two majors. An alternative is to select the general administration major described below, which is designed for students who prefer to take a variety of electives in different areas. The substitution of any courses for a major requires the written approval of the appropriate Department Chair. No more than one independent study/research paper (three hours) may be taken in lieu of a course to fulfill a specialization requirement, and no more than one course will be allowed to count towards two majors in the M.B.A. 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 choose three of the following courses.

<table>
<thead>
<tr>
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</thead>
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<tr>
<td>Select three of the following:</td>
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<tr>
<td>INF6 150</td>
<td>Business Intelligence Management</td>
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<tr>
<td>INF6 550</td>
<td>Systems Analysis And Design (prerequisite BUAD 6800)</td>
<td></td>
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<tr>
<td>INF6 610</td>
<td>Information Storage And Retrieval Structures</td>
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<td>INF6 610</td>
<td>Management of Information Systems Security</td>
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</tbody>
</table>

Total Hours 9

MBA Operations and Supply Chain Management
Common Body of Knowledge
(18 hours maximum)

These courses represent the minimum background required of students prior to taking 6000-level courses in the M.B.A. program. Students admitted to the M.B.A. program can meet the requirements by taking the 5000-level courses or by proficiency examination. If a student can demonstrate that he/she has 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.

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</tr>
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<td>MKTG 5410</td>
<td>Marketing Systems</td>
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<td>OSMC 5510</td>
<td>Business Statistics With Computer Applications</td>
<td>3</td>
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<tr>
<td>OSMC 5520</td>
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Total Hours 18

M.B.A. Core
(24 hours)

These courses are required of all students. They are reflective of business techniques, methodology and processes, and are designed to be cross-functional and integrative.

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<td>BUAD 6400</td>
<td>Results-Based Management</td>
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Total Hours 24

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 core class with an M.B.A. elective of their choice.

**Elective Courses**

(Minimum 9 hours)

Each student may select up to two majors. An alternative is to select the general administration major described below, which is designed for students who prefer to take a variety of electives in different areas. The substitution of any courses for a major requires the written approval of the appropriate Department Chair. No more than one independent study/research paper (three hours) may be taken in lieu of a course to fulfill a specialization requirement, and no more than one course will be allowed to count towards two majors in the M.B.A. program.

**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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>OSCM 6680</td>
<td>Quality Management and Six Sigma</td>
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<td>OSCM 6690</td>
<td>Supply Chain Resources Management</td>
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<td>And one of the following:</td>
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<tr>
<td>OSCM 6250/INFS 6780</td>
<td>Essentials of Business Analytics</td>
<td></td>
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<tr>
<td>OSCM 6270</td>
<td>Simulation and Waiting Lines</td>
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<tr>
<td>INFS 6780</td>
<td>ERP Systems Process Management</td>
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<tr>
<td>OSCM 6980</td>
<td>Special Topics in Operations and Supply Chain Management</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours: 9

**Department of Management**

Sonny Ariss, Chair

**Degrees Offered**

- EMBA Executive Management (p. 75)
- MBA Administration (p. 76)
- MBA Healthcare Systems Management (p. 77)
- MBA Human Resource Management (p. 77)
- MBA Leadership (p. 78)
- MBA Management (p. 79)
- Ph.D. in Manufacturing and Technology Management (Ph.D.) (p. 79)

**BUAD 6100 Accounting For Decision Making**

[3 credit hours (3, 0, 0)]

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 and ACTG 1050 or BUAD 2040 and BUAD 2050 or ACCT 5000

**Term Offered:** Spring, Summer, Fall

**BUAD 6200 Financial Systems**

[3 credit hours (3, 0, 0)]

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 or BUAD 2040 and BUAD 2050 or ACTG 1040 and ACTG 1050

**Term Offered:** Spring, Summer, Fall

**BUAD 6300 Strategic Marketing And Analysis**

[3 credit hours (3, 0, 0)]

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.

**Prerequisites:** MKTG 5410 or BUAD 3010

**Term Offered:** Spring, Summer, Fall

**BUAD 6400 Results-Based Management**

[3 credit hours (3, 0, 0)]

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 (3, 0, 0)]

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 (3, 0, 0)]
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 3020 or OPMT 5520 or OSCM 5520
Term Offered: Spring, Summer, Fall

BUAD 6800 Information Technology And E-Business
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 6200 and BUAD 6300)
Term Offered: Spring, Summer, Fall

BUAD 6920 Specialization Internship Opportunity
[1-4 credit hours (0, 0, 1-4)]
Receive practical business experience working in an organization, while meeting with other students and learning about their experiences.
Term Offered: Spring, Fall

BUAD 6980 Special Topics In Business Administration
[1-4 credit hours (0, 0, 1-4)]
Independent study to be arranged with the Director, M.B.A. program.
Term Offered: Spring, Summer, Fall

EMBA 5500 Analytic Foundation For Executives
[3 credit hours (3, 0, 0)]
This course provides managers with the analytical foundations in economics, computer skills and statistical methods. Internet exercises prior to class meetings provide the basis for continuous discussions of current economic events.
Term Offered: Fall

EMBA 6100 Global Competitive Challenge
[3 credit hours (3, 0, 0)]
An overview of the competitive challenge faced by firms in today’s global setting. Executives select nations or regions and industries to analyze in terms of the competitive challenge. Factors which helped the nations/regions to achieve competitive advantage will be studied to gain a better understanding of the competitive challenge.
Prerequisites: EMBA 5500
Term Offered: Fall

EMBA 6120 Cultural, Legal, & Operational Issues in Doing Business Abroad
[3 credit hours (3, 0, 0)]
This course develops the executive’s appreciation, knowledge, and understanding of the different cultures and legal systems as they impact business operations in doing business in major foreign countries or regions, including emerging markets. The underpinning of cross-cultural literacy for global competitive advantage is emphasized.
Prerequisites: EMBA 5500
Term Offered: Spring, Fall

EMBA 6140 Accounting And Financial Foundations For Executives
[3 credit hours (3, 0, 0)]
This course gives an overview of the firm from a financial management perspective including financial decision making. Topics covered include the time value of money, stock and bond valuation, and capital budgeting decision rules.
Prerequisites: EMBA 5500
Term Offered: Spring

EMBA 6200 Personal Strategic Planning And Entrepreneurship
[3 credit hours (3, 0, 0)]
Executives assess their personal values, clarifying their personal goals and develop a career strategy. Identifying market opportunities and developing new businesses for today’s technological and global environment are explored.
Prerequisites: EMBA 5500
Term Offered: Fall

EMBA 6210 Processes for Ethical Business Decisions
[3 credit hours (3, 0, 0)]
Introduces executives to specific analytical processes for identifying the ethical dilemmas frequently experienced in business, resolving them and then justifying the course of action selected from multiple ethical perspectives. These processes are essential for recognizing and understanding the ethical implications of complex and controversial problems in culturally diverse and competitive organizations. The course involves ongoing practice in ethical dilemma resolution in both group and individual formats involving various ethical scenarios.
Prerequisites: EMBA 5500
Term Offered: Spring, Summer, Fall

EMBA 6220 Accounting Systems For Operational And Strategic Management
[3 credit hours (3, 0, 0)]
Emphasizes the preparation and use of financial statements, accounting for international transactions and tax consequences of U.S. and international operations. Managerial accounting and control systems are examined. Focuses on the tax consequences of selected transactions of both U.S. and international operations.
Prerequisites: EMBA 5500
Term Offered: Fall
EMBA 6230 Market-Driven Analysis And Strategy  
[3 credit hours (3, 0, 0)]  
This course focuses on what it means to be market-oriented and provides individuals with a basic understanding of the market-based management practices needed to create superior customer value. Being ‘market-driven’ 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 and make it a competitive advantage.  
Prerequisites: EMBA 5500  
Term Offered: Spring  

EMBA 6240 Entrepreneurial Financial Management  
[3 credit hours (3, 0, 0)]  
Studies the management of international financial activities, including financial planning and forecasting, capital budgeting and leasing, capital structure, working capital management, sources of funds, business valuation and risk management.  
Prerequisites: EMBA 5500  
Term Offered: Spring  

EMBA 6250 Leadership And Performance Management  
[3 credit hours (3, 0, 0)]  
Executives learn to be visionary leaders by understanding how change, culture and strategy link to the vision. This course also focuses on employee motivation, development and empowerment, culminating in insights on how to manage performance in order to achieve the company’s mission.  
Prerequisites: EMBA 5500  
Term Offered: Summer  

EMBA 6290 Strategic Management In A Global Environment  
[3 credit hours (3, 0, 0)]  
The goal of the capstone course is for each executive to finish an integrated business plan creating value for his or her sponsoring firm. Strategic planning tools are studied.  
Prerequisites: EMBA 5500  
Term Offered: Fall  

EMBA 6300 Global Technology Management  
[3 credit hours (3, 0, 0)]  
This course focuses on the strategic and technical challenges facing executives who want to take advantage of today’s existing and emerging technological developments to enhance business opportunities. Best practices are reviewed and the focus is on how executives can manage technology across functions to best achieve competitive advantage.  
Prerequisites: EMBA 5500  
Term Offered: Summer  

EMBA 6310 Managing Global Supply Chains  
[3 credit hours (3, 0, 0)]  
Examines how e-business models, information technology and globalization have changed supply chain design and management. Effective information management for decision making is explored.  
Prerequisites: EMBA 5500  
Term Offered: Spring, Summer  

EMBA 6320 Product Development  
[3 credit hours (3, 0, 0)]  
This course is designed to provide an understanding of how new products/services and e-business initiatives are developed and managed and explores the tools and skills needed to manage these processes.  
Prerequisites: EMBA 5500  
Term Offered: Spring  

EMBA 6470 Global/E-Business Field Trip  
[2 credit hours (0, 0, 2)]  
This experiential international field trip facilitates student learning of best business practices from senior executives in a variety of multinational firms and organizations across industries, and enables them to gain new insights from being immersed in foreign cultural environments.  
Prerequisites: EMBA 5500  
Term Offered: Fall  

EMBA 6980 Special Topics in Business  
[1-3 credit hours (1-3, 0, 0)]  
Analysis of current issues in business, specialized industries, or specific markets. Syllabus determined jointly by EMBA office and faculty as special topics are identified.  

EMBA 6990 Independent Study  
[3 credit hours (3, 0, 0)]  
Independent research report on a business topics of interest to the student and faculty member. Students must work with a professor on this project. Permission of Instructor required.  

HURM 6700 Human Resource Management  
[3 credit hours (3, 0, 0)]  
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  

HURM 6710 Employment And Labor Law  
[3 credit hours (0, 0, 3)]  
This course introduces the objectives, activities and practices involved in employment and labor law. It is designed for those pursuing careers in human resources or managers wishing to understand their responsibilities in this area.  
Term Offered: Fall  

HURM 6720 Advanced Negotiation and Conflict Management  
[3 credit hours (0, 0, 3)]  
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  

HURM 6730 Performance Management  
[3 credit hours (0, 0, 3)]  
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
HURM 6750 Current Topics In Human Resource Management
[3 credit hours (0, 0, 3)]
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
Term Offered: Spring, Summer, Fall

HURM 6760 Talent Management
[3 credit hours (3, 0, 0)]
Talent management uses interconnected human resources to provide organizational benefits though developing a strategic approach to managing core talent encompassing recruiting, onboarding, training, performance management, and succession planning.
Prerequisites: HURM 6700
Term Offered: Spring, Fall

HURM 6800 Tools And Techniques In Human Resource Management
[3 credit hours (3, 0, 0)]
Course covers issues and techniques related to human resource management science. A variety of applications with emphasis on technology management as it relates to the management of product, manufacturing and supply chain technologies will be discussed.
Term Offered: Spring, Fall

HURM 8700 Human Resource Management
[3 credit hours (3, 0, 0)]
Introduces the objectives, activities, and practices involved in human resource management. Designed for both those pursuing careers in human resources or managers who wish to supplement their skills in this area. (Prerequisite: None)

HURM 8710 Employment and Labor Law
[3 credit hours (3, 0, 0)]
Introduces the objectives, activities, and practices involved in employment and labor law. Designed for those pursuing careers in human resources or managers wishing to understand their responsibilities in this area.

HURM 8720 Employer-Employee Relations
[3 credit hours (3, 0, 0)]
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.

HURM 8730 Performance Management
[3 credit hours (3, 0, 0)]
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.
Prerequisites: HURM 6700 and HURM 8700

HURM 8740 Human Resource Strategy and Metrics
[3 credit hours (3, 0, 0)]
Focuses on the integration of human resource strategies with the strategies of the firm. Students will learn how to assess and measure human resource processes, programs, and outcomes.
Prerequisites: HURM 6700 and HURM 8700
Term Offered: Spring

HURM 8750 Current Topics in Human Resource Management
[3 credit hours (3, 0, 0)]
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 and HURM 8700
Term Offered: Fall

MFGM 8480 Management of Technology
[3 credit hours (3, 0, 0)]
This seminar covers conceptual framework and relevant research studies on technology management. The literature from Technology Management as it relates to the management of product, manufacturing and supply chain technologies will be discussed.
Term Offered: Spring, Fall

MFGM 8490 Supply Chain and E-Business Issues in Manufacturing
[3 credit hours (3, 0, 0)]
This seminar focuses broadly on key issues relating effective management of product, information and financial flows in supply chains. It also relates to E-business practices, and their impact on supply chain design and management.
Term Offered: Spring

MFGM 8510 Supply Chain and Technology Management Analytics
[3 credit hours (3, 0, 0)]
This course focuses on advanced analytical methods and applications in supply chain and technology management. The first part of the course focuses on mathematical modeling and algorithms in supply chain management, while the second part focuses on how to use data to develop business insights and predictive capabilities.

MFGM 8530 Management Science
[3 credit hours (3, 0, 0)]
This course is an applied study of deterministic and stochastic methods of management science. A variety of applications with emphasis on manufacturing and technology management are introduced.
Term Offered: Spring

MFGM 8640 Advanced Management Science
[3 credit hours (0, 0, 3)]
The course introduces students to advanced theory, algorithms, and applications of management science techniques, including dynamic programming, nonlinear programming, game theory, etc. The methods have applications to supply chain management, manufacturing, transportation, marketing, and economics.
MFGM 8650 Stochastic Modeling  
[3 credit hours (0, 0, 3)]  
This course covers basic principles and methods in applied probability and stochastic modeling. The topics covered in this course include advanced probability theory, stochastic processes, Markov chains, Markov Decision Processes, queuing theory, computer simulation, etc. Applications of these techniques in supply chain management, manufacturing, transportation, and finance are introduced.

MFGM 8660 Qualitative Research Methodology  
[3 credit hours (0, 0, 3)]  
This course explores the use of qualitative methods within the fields of Information Systems and Operations Management. The seminar discusses the different qualitative methods that include Case Study, Ethnography, and Grounded Theory. In addition, we examine the differences between interpretive and positivist approaches using qualitative methods. This course covers research design and the various techniques in analyzing qualitative data. The course includes a discussion about mitigating bias in the areas of data collection and analysis.

MFGM 8670 Special Topics in Research Methods  
[3 credit hours (0, 0, 3)]  
This course focuses on contemporary research methods within the fields of manufacturing and technology management, including Operations and Supply Chain Management, Information Systems, etc. The specific topic on contemporary research methods will change each time.

MFGM 8810 Seminar/Colloquium  
[1 credit hour (0, 0, 1)]  
One credit hour requirement of these courses will be met by requiring the students to attend a reasonable number (10) of research seminars and colloquia in and outside the college, doctoral dissertation proposal and defenses at the college, etc., during one academic year.  
Term Offered: Spring, Fall

MFGM 8840 Manufacturing Strategy  
[4 credit hours (4, 0, 0)]  
The seminar examines the theory and research related to the formulation and implementation of manufacturing strategy including the strategic planning process and techniques for industry and competitive analysis.  
Prerequisites: MGMT 5110 or ORGD 7110

MFGM 8850 Readings And Research In Manufacturing Management  
[1-12 credit hours (0, 0, 0-1)]  
This individually designed course will provide advanced readings in areas needed by a doctoral student.  
Term Offered: Spring, Summer, Fall

MFGM 8860 Advanced Statistics  
[3 credit hours (3, 0, 0)]  
This course discusses multivariate data analysis. Topics include: principal components analysis, factor analysis, multidimensional scaling, cluster analysis, multiple regression analysis and multivariate analysis of variance. Statistical software packages are used.  
Prerequisites: OPMT 5510  
Term Offered: Summer, Fall

MFGM 8870 Seminar in Statistics/ Research Method  
[3 credit hours (3, 0, 0)]  
This is an advanced second course in Statistical methods or management science or research methods. This course is designed for individual needs of the student to provide more depth in the research method as required.  
Term Offered: Summer

MFGM 8880 Research Methods-Theory Bldg  
[3 credit hours (3, 0, 0)]  
The course seeks to frame and discuss key issues that arise as social scientists conduct theoretically-relevant empirical research. In the course, the theory building in manufacturing management as well as research process and the literature, tools and techniques associated with each phase of the process will be introduced.  
Term Offered: Fall

MFGM 8890 Advanced Manufacturing Systems  
[3 credit hours (3, 0, 0)]  
This seminar provides an understanding of the design and management of manufacturing systems. This begins with an understanding of how manufacturing has evolved over time, continues with descriptions of current trends and ideas in manufacturing system design and concludes with discussion of future changes,  
Term Offered: Spring, Summer, Fall

MFGM 8900 Field Research  
[1-8 credit hours (0, 0, 0-4)]  
This course provides students with the opportunity to experience a realistic manufacturing problem and to develop approaches to solving that problem under the supervision of a faculty member.  
Term Offered: Spring, Fall

MFGM 8960 Dissertation  
[1-8 credit hours (0, 0, 0-8)]  
Dissertation  
Term Offered: Spring, Summer, Fall

MFGM 8980 Special Topics Seminar  
[3 credit hours (3, 0, 0)]  
This seminar focuses on current topics relating to manufacturing and technology management. The specific seminar topic will change each semester.  
Term Offered: Spring, Summer, Fall

MGMT 5110 Introduction To Management  
[3 credit hours (3, 0, 0)]  
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 6110 Leading Through Ethical Decision-Making  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]
The course explores how one's own leadership competencies can be developed and applied most effectively in a variety of situations. 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: Fall

MGMT 6160 Leading With Power and Influence
[3 credit hours (3, 0, 0)]
Students will develop an understanding of the strategic use of power and influence to exercise leadership in organizations. Skill development in the diagnosis and practical use of power and influence to mobilize action, to negotiate, and to resolve conflicts will be emphasized.
Term Offered: Spring, Fall

MGMT 6190 Leading change and Organizational Improvement
[3 credit hours (3, 0, 0)]
Students will learn and apply the key theories and practices of change management and organizational development processes.
Term Offered: Spring

MGMT 6930 Independent Research
[1-3 credit hours (0, 0, 0-3)]
Independent research opportunities are provided to advanced students for pursuing topics in depth under the faculty supervision.
Term Offered: Spring, Summer, Fall

PUBH 5020 Occupational Health
[3 credit hours (3, 0, 0)]
Hazardous materials, mathematics, anatomy, and physiology; hazard recognition for harmful agents; methods, standards, recommendations, and instruments used to evaluate hazards; techniques for hazard control; occupational health programs and regulations; communication and ethics.
Term Offered: Fall

PUBH 5060 Occupational Safety
[3 credit hours (3, 0, 0)]
Safety and health organization, administration, management, services; controlling unsafe conditions/acts relation to construction and buildings, machines, materials handling, pressure vessels, electrical equipment; emergency procedures; communication effectiveness and ethical guidelines/standards.
Term Offered: Fall

PUBH 5160 Environmental Health
[3 credit hours (3, 0, 0)]
Scientific, regulatory and management principles applicable to human disease associated with food, water, air and soil contamination. Focuses on biology and chemistry of contamination and transformation, exposure monitoring and contaminant control.
Term Offered: Spring, Fall

PUBH 5260 Haz Mat and Emerg Response
[3 credit hours (3, 0, 0)]
(terrorism) Disaster preparedness and emergency response; and, personal protective equipment and site assessment/monitoring. This course requires the student to wear personal protective equipment, perform hands on monitoring and sampling, and assess and respond to in class response scenarios.
Term Offered: Spring, Summer, Fall

PUBH 5310 Chemical Agents
[3 credit hours (3, 0, 0)]
Scientific principles and practices applicable to the qualitative and quantitative evaluation of chemical agents associated with human diseases resulting from various environmental exposures. Content includes methods to assess exposures in the workplace.
Term Offered: Spring

PUBH 5410 Hazard Control
[3 credit hours (0, 0, 0)]
Ventilation; control of indoor and outdoor (ambient) air pollution; operation of dilution and location exhaust ventilation systems; design of ventilation systems; respiratory and other personal protective equipment and programs available or commonly used in the workplace; communication and ethics.
Term Offered: Spring

PUBH 5520 Biological Agents
[3 credit hours (3, 0, 0)]
Scientific principles and practices applicable to the pathogenicity, evaluation and control of microbiological agents, parasitic agents, and some biological vectors associated with human diseases resulting from various environmental exposures. Content includes normal/abnormal human physiology relative to exposure, exposure assessment, and exposure control.
Term Offered: Summer, Fall

PUBH 5620 Physical Agents
[3 credit hours (0, 0, 0)]
Monitor exposure to physical agents; assessment of exposure to physical agents; appropriate exposure control methods of physical agents; professional reports; laws, regulations, recommendations, standards, services related to physical agents; communication and ethics.
Term Offered: Spring

PUBH 5700 Risk Assessment
[3 credit hours (3, 0, 0)]
Human health risk assessment including hazard identification, dos-response assessment, human exposure assessment, and risk characterization are discussed. Emphasis on practice of risk assessment, management, and communication relative to public, environmental, and occupational health and safety.
Term Offered: Summer, Fall

PUBH 5720 Exposure Assessment Strategies
[3 credit hours (3, 0, 0)]
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 or PUBH 600
Term Offered: Spring
PUBH 6000 Biostatistics
[3 credit hours (3, 0, 0)]
An introduction to descriptive statistics including measurement of central tendency, dispersion, relative position, correlation, and regression. Inferential statistical theory, selected nonparametric methods, application of computers, and also occupational exposure assessment will be discussed.
**Term Offered:** Spring, Fall

PUBH 6010 Public Health Epidemiology
[3 credit hours (3, 0, 3)]
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 (3, 0, 0)]
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:** Summer

PUBH 6030 Advanced Epidemiology
[3 credit hours (3, 0, 0)]
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:** Summer

PUBH 6060 Advanced Biostatistics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Introduces genetic epidemiology methods, principles of population genetics including linkage and association studies used in assessing familial aggregation, and transmission patterns for identifying the genetic basis of common diseases.
**Prerequisites:** (PUBH 6000 or PUBH 8000) and (PUBH 6010 or PUBH 8010) or (PUBH 600 or PUBH 800) and (PUBH 601 or PUBH 801)
**Term Offered:** Summer

PUBH 6080 Social Determinants of Health
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 6100 Environ/Occup Epidemiology
[3 credit hours (0, 0, 0)]
The course focuses on the application of epidemiological techniques to the study of effects of occupational and environmental exposures. Prerequisite: PUBH600 and 601.

PUBH 6110 Categorical Data Analysis
[3 credit hours (3, 0, 0)]
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

PUBH 6120 Epidemiology Infectious Diseases
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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

PUBH 6160 Reproductive Epidemiology
[3 credit hours (3, 0, 0)]
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 or PUBH 601
**Term Offered:** Spring
PUBH 6170 Molec and Genomic Epidemiology
[3 credit hours (3, 0, 0)]
Present concepts and methods of molecular and genetic epidemiology relevant to the study of prevalent diseases in the population. Topics include biomarkers, polymorphism and gene-envonment interaction. The evolution and function of the genomics and a synopsis of epidemiological design and analysis are included.

PUBH 6180 Cancer Epidemiology
[3 credit hours (0, 0, 0)]
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 (3, 0, 0)]
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 or PUBH 8000

Term Offered: Fall

PUBH 6200 Methods, Materials for PUBH
[3 credit hours (0, 0, 0)]
Introduces students to resource materials and methods appropriate for public health education. Students will use various mediums of instruction in direct application to public health programs.

Term Offered: Spring, Fall

PUBH 6250 Nutritional Epidemiology
[3 credit hours (0, 0, 0)]

PUBH 6300 Community Health Organization
[3 credit hours (0, 0, 0)]
Focuses on techniques to bring about change in a community's health status through assessment, public advocacy, coalition building, decision-making, planning, policy development, and political influence. Applications will be emphasized.

Term Offered: Spring

PUBH 6330 Public Health and Aging
[3 credit hours (0, 0, 0)]
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: Summer

PUBH 6410 Global Perspectives on Public Health and Disaster Preparedness
[3 credit hours (2, 1, 0)]
This course introduces the introductory healthcare learner (including but not limited to MD, MPH, PA, MSN, MSBS, OT, PT) to specific principles of global perspectives on disaster management and response. Covers epidemiology of various diseases and population health issues from a global and domestic perspective. Employs an all-hazards framework, providing essential skills to function in the event of a catastrophe. Guest speakers from healthcare disciplines who work internationally will present first-hand experiences in managing disasters.

Term Offered: Spring

PUBH 6420 Social Marketing in Health
[3 credit hours (3, 0, 0)]
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 Ps” 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 (3, 0, 0)]
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: Summer

PUBH 6460 Health Promotion Programs
[3 credit hours (3, 0, 0)]

PUBH 6500 Disaster Preparedness/Response
[3 credit hours (3, 0, 0)]

PUBH 6500 Video in Public Health
[3 credit hours (0, 0, 0)]

PUBH 6510 Issues in Pandemic Preparedness and Response
[3 credit hours (2, 1, 0)]
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

PUBH 6520 Public Health Nutrition
[3 credit hours (0, 0, 0)]

PUBH 6550 Chronic Disease Epidemiology
[3 credit hours (3, 0, 3)]
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 or PUBH 601

Term Offered: Spring, Summer, Fall
PUBH 6560 Interdisciplinary Crisis Management for Medical and Public Health Professionals
[3 credit hours (3, 0, 0)]
The purpose of this semester course is to introduce the interdisciplinary healthcare learner (including but not limited to MD, PA, MPH, MSN, OT and PT students) to specific principles of epidemiology and disaster medicine employing an all-hazards framework and to provide essential skills enabling proper functioning in the event a catastrophe arises in the near future. The course will include lectures, simulation exercises and independent web-assisted content.
Term Offered: Spring, Fall

PUBH 6600 Health Behavior
[3 credit hours (0, 0, 0)]
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 (3, 0, 0)]
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: Fall

PUBH 6630 Public Health Advocacy
[3 credit hours (3, 0, 0)]
An examination of the importance of advocacy for the individual, community, and public health professionals. Special emphasis will be placed on developing advocacy-based skills to effectively advocate at the micro and macro level. In addition, students will participate in advocacy efforts external to the university to gain experience that enriches the student's training.
Term Offered: Spring

PUBH 6730 Research Environmental Health
[3 credit hours (0, 0, 3)]
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 Indep Study in Biostatistics
[0-3 credit hours (0, 0, 0)]
This course addresses areas of biostatistics not covered by a regular course offering. It is intended to provide students the knowledge and experience needed in that area. This course is designed for public health students and could be beneficial to Ph.D. students, specifically those who need advanced statistical techniques for their dissertation. Topics include survival analysis, statistical models in carcinogenesis, statistical genetics, nonparametric statistics and multivariate techniques. May be repeated for credit.
Term Offered: Spring, Summer, Fall

PUBH 6800 Evaluation of Health Programs
[3 credit hours (3, 0, 0)]
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 (UT-Main). Prerequisites: HEAL 6460/HEAL 8460; co-requisite: HEAL 6750.
Term Offered: Spring, Fall

PUBH 6890 Indep Study in Public Health
[1-3 credit hours (0, 0, 0)]
The student and instructor will agree on a program of study that will enable the student to achieve specific learning objectives in environmental health. May be repeated for credit.
Term Offered: Spring, Summer, Fall

PUBH 6950 Integrative Learning Experience
[2 credit hours (0, 0, 2)]
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 6960 Internship in Public Health
[1-4 credit hours (0, 0, 1-4)]
Comprehensive or focused practical training in environmental and occupational health at a designated agency, organization, or company.
Term Offered: Spring, Summer, Fall

PUBH 6970 Project in Public Health
[1-4 credit hours (0, 0, 0)]
Independent development by a student with approval and guidance by a Major Advisor, of a paper, manual, software, etc. applicable to a specific area of environmental and occupational health.
Term Offered: Spring, Summer, Fall

PUBH 6980 Seminar in Public Health
[1-3 credit hours (0, 0, 0)]
A systematic study of selected topics in public health. Course meets for three consecutive semesters. Students may begin any semester, but must complete in sequence. Students register for one credit each term for a cumulative total of three consecutive semesters. May be repeated for credit.

PUBH 6990 Thesis Research
[1-4 credit hours (0, 0, 0)]

PUBH 8000 Biostatistics
[3 credit hours (3, 0, 0)]
This course will present principles of the epidemiology method including problem solving. Various study designs will be discussed, including prospective and retrospective studies, analytical, and experimental methods.
Term Offered: Spring, Fall
PUBH 8020 Management and Leadership in Public Health
[3 credit hours (3, 0, 0)]
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, Fall

PUBH 8030 Advanced Epidemiology
[3 credit hours (3, 0, 0)]
The 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: Summer

PUBH 8060 Advanced Biostatistics
[3 credit hours (3, 0, 0)]

PUBH 8090 Issues in Public Health
[3 credit hours (3, 0, 0)]
Examination of various contemporary issues in public health. Included are 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 (3, 0, 0)]

PUBH 8120 Epidemiology Infectious Disease
[3 credit hours (3, 0, 0)]
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: Fall

PUBH 8130 Molecular Epidemiology
[3 credit hours (3, 0, 0)]
This course covers both the major theoretical and practical issues of conducting an epidemiologic study involving molecular and genomic techniques. The course will emphasize from infectious disease, chronic disease, and cancer research literature.
Term Offered: Fall

PUBH 8150 Clinical Epidemiology
[3 credit hours (3, 0, 0)]
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

PUBH 8160 Reproductive Epidemiology
[3 credit hours (3, 0, 0)]
Additional assignments are here for students who will take this course as PUBH 8160. Covers broad reproductive health issues from the pre-conception, pre-natal, delivery, and post-natal periods and emphasizes how these issues affect women, men, babies, and infants. Relevant methodological and programmatic issues will be presented with practical illustrations from domestic and international settings. Guest speakers, including health care providers, will give real world experience and insight to these topics of study.
Prerequisites: PUBH 6010 and PUBH 8010
Term Offered: Spring

PUBH 8170 Molecular and Genomic Epidemiology
[3 credit hours (3, 0, 0)]

PUBH 8180 Cancer Epidemiology
[3 credit hours (0, 0, 3)]
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: Summer

PUBH 8330 Public Health and Aging
[3 credit hours (0, 0, 3)]
Examines public health and aging issues in contemporary society. Introduces physical, cognitive, and affective function from a public health perspective. Prevention and health promotion are included.
Term Offered: Summer

PUBH 8410 Global Perspectives on Public Health and Disaster Preparedness
[3 credit hours (2, 1, 0)]
This course introduces the introductory healthcare learner (including but not limited to MD, MPH, PA, MSN, MSBS, OT, PT) to specific principles of global perspectives on disaster management and response. Covers epidemiology of various diseases and population health issues from a global and domestic perspective. Employs an all-hazards framework, providing essential skills to function in the event of a catastrophe. Guest speakers from healthcare disciplines who work internationally will present first-hand experiences in managing disasters.
Term Offered: Spring

PUBH 8420 Social Marketing in Health
[3 credit hours (3, 0, 0)]
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 Ps” 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 8430 Community Mental Health**  
[3 credit hours (3, 0, 0)]  
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: Summer

**PUBH 8500 Disaster Preparedness/Response**  
[3 credit hours (3, 0, 0)]

**PUBH 8510 Issues in Pandemic Preparedness and Response**  
[3 credit hours (2, 1, 0)]
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

**PUBH 8550 Chronic Disease Epidemiology**  
[3 credit hours (3, 0, 3)]
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 or PUBH 601  
Term Offered: Summer

**PUBH 8560 Interdisciplinary Crisis Management for Medical and Public Health Professionals**  
[3 credit hours (3, 0, 0)]
The purpose of this semester course is to introduce the interdisciplinary healthcare learner (including but not limited to MD, PA, MPH, MSN, OT and PT students) to specific principles of epidemiology and disaster medicine employing an all-hazards framework and to provide essential skills enabling proper functioning in the event a catastrophe arises in the near future. The course will include lectures, simulation exercises and independent web-assisted content.  
Term Offered: Spring, Fall

**PUBH 8620 Introduction to Health Policy and Health Systems**  
[3 credit hours (3, 0, 0)]
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: Fall

**PUBH 8630 Public Health Advocacy**  
[3 credit hours (3, 0, 0)]
An examination of the importance of advocacy for the individual, community, and public health professionals. Special emphasis will be place on developing advocacy-based skills to effectively advocate at the micro and macro level. In addition, students will participate in advocacy efforts external to the university to gain experience that enriches the student's training.  
Term Offered: Spring

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**EMBA Executive Management**

The College of Business and Innovation offers an innovative Executive M.B.A. (E.M.B.A.) program for executives of mid-sized and growing firms. The program curriculum is designed to enhance the ability of managers to manage the change and growth common in today's competitive environment. To accomplish this, participants in the program take courses built around three major integrative themes - entrepreneurship, e-business, and competition in a global marketplace.

The E.M.B.A. program is designed with experienced managers in mind and is tailored to fit their schedules. Through the use of a structured approach, executives are able to pursue an M.B.A. with their peers at a level and pace appropriate to their business experience.

**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. 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.
3. A current resume to allow the Admissions Committee the opportunity to assess the individual's work experience.
4. Employer nomination form and two letters of recommendation from individuals who know the applicant in a professional capacity, one of which must be from the applicant's employer. The employer nomination form must be completed by someone other than those completing the letters of recommendation. Self-employed applicants may substitute the employer nomination with a third professional reference.
5. In the case of students whose native language is not English, a score of at least 550 (paper based), 213 (computer based), or 80 (internet based) on the Test of English as a Foreign Language (TOEFL) is mandatory. **

* The GMAT can be waived for applicants with sufficient supervisory experience.

** The TOEFL can be waived for applicants who are permanent residents and have worked in the US for more than one year provided the E.M.B.A. Admissions Committee determines the applicants' language proficiency. If an applicant to the E.M.B.A. program is on an F1 or J1 visa, they must provide passing TOEFL or IELTS scores unless there is evidence of an earned US degree.

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.
MBA Administration

Master of Business Administration (M.B.A.)

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.

The M.B.A. degree is granted to students who satisfactorily complete a minimum of 33 semester hours at the 6000-level in the College of Business and Innovation. 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 (18 hours), core (24 hours) and elective (9 - 12 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.

Common Body of Knowledge

(18 hours maximum)

These courses represent the minimum background required of students prior to taking 6000-level courses in the M.B.A. program. Students admitted to the M.B.A. program can meet the requirements by taking the 5000-level courses or by proficiency examination. If a student can demonstrate that he/she has 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.

M.B.A. Core

(24 hours)

These courses are required of all students. They are reflective of business techniques, methodology and processes, and are designed to be cross-functional and integrative.

Elective Courses

(Minimum 9 hours)

Each student may select up to two majors. An alternative is to select the general administration major described below, which is designed for students who prefer to take a variety of electives in different areas. The substitution of any courses for a major requires the written approval of the appropriate Department Chair. No more than one independent study/research paper (three hours) may be taken in lieu of a course to fulfill a specialization requirement, and no more than one course will be allowed to count towards two majors in the M.B.A. program.

General Administration

The Administration major is designed for students who want the added flexibility of taking courses in a variety of areas. The Administration major is completed by taking three 6000-level M.B.A. electives within the College of Business and Innovation. Students are not permitted to take PUBH courses from the Healthcare Systems 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.

MBA Healthcare Systems Management

Common Body of Knowledge
(18 hours maximum)

These courses represent the minimum background required of students prior to taking 6000-level courses in the M.B.A. program. Students admitted to the M.B.A. program can meet the requirements by taking the 5000-level courses or by proficiency examination. If a student can demonstrate that he/she has 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.

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<td>ACCT 5000</td>
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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 core class with an M.B.A. elective of their choice.

Elective Courses
(Minimum 9 hours)

Each student may select up to two majors. An alternative is to select the general administration major described below, which is designed for students who prefer to take a variety of electives in different areas. The substitution of any courses for a major requires the written approval of the appropriate Department Chair. No more than one independent study/research paper (three hours) may be taken in lieu of a course to fulfill a specialization requirement, and no more than one course will be allowed to count towards two majors in the M.B.A. program.

Healthcare Systems Management

The Healthcare Systems Management major with a concentration in Public Health 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 General Administration major. Effective Spring 2019 all courses will be taught through The University of Toledo.

MBA Human Resource Management

Common Body of Knowledge
(18 hours maximum)

These courses represent the minimum background required of students prior to taking 6000-level courses in the M.B.A. program. Students admitted to the M.B.A. program can meet the requirements by taking the 5000-level courses or by proficiency examination. If a student can demonstrate that he/she has 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.

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M.B.A. Core
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**Common Body of Knowledge**

(18 hours maximum)

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**M.B.A. Core**

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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 core class with an M.B.A. elective of their choice.

**Elective Courses**

(Minimum 9 hours)

Each student may select up to two majors. An alternative is to select the general administration major described below, which is designed for students who prefer to take a variety of electives in different areas. The substitution of any courses for a major requires the written approval of the appropriate Department Chair. No more than one independent study/research paper (three hours) may be taken in lieu of a course to fulfill a specialization requirement, and no more than one course will be allowed to count towards two majors in the M.B.A. program.

**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).

In addition to HURM 6700 (typically offered summer and fall terms), students majoring in Human Resource Management must choose three additional courses of the following.

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<td>Select three of the following:</td>
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<td>HURM 6710</td>
<td>Employment And Labor Law</td>
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<tr>
<td>HURM 6720</td>
<td>Advanced Negotiation and Conflict Management</td>
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<td>HURM 6750</td>
<td>Current Topics In Human Resource Management</td>
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<td>HURM 6760</td>
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**MBA Leadership**

Each student may select up to two majors. An alternative is to select the general administration major described below, which is designed for students who prefer to take a variety of electives in different areas. The substitution of any courses for a major requires the written approval of the appropriate Department Chair. No more than one independent study/research paper (three hours) may be taken in lieu of a course to fulfill a
specialization requirement, and no more than one course will be allowed to count towards two majors in the M.B.A. program.

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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT 6100</td>
<td>Leading Through Ethical Decision-Making</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 6150</td>
<td>Leading and Developing Yourself</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 6160</td>
<td>Leading With Power and Influence</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 6190</td>
<td>Leading change and Organizational Improvement</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

MBA Management

Common Body of Knowledge

These courses represent the minimum background required of students prior to taking 6000-level courses in the M.B.A. program. Students admitted to the M.B.A. program can meet the requirements by taking the 5000-level courses or by proficiency examination. If a student can demonstrate that he/she has 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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 5000</td>
<td>Financial And Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>FINA 5210</td>
<td>Economics For Business Decisions</td>
<td>3</td>
</tr>
<tr>
<td>FINA 5310</td>
<td>Managerial Finance</td>
<td>3</td>
</tr>
<tr>
<td>MKTG 5410</td>
<td>Marketing Systems</td>
<td>3</td>
</tr>
<tr>
<td>OSCM 5510</td>
<td>Business Statistics With Computer Applications</td>
<td>3</td>
</tr>
<tr>
<td>OSCM 5520</td>
<td>Analysis of Manufacturing and Service Systems</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

M.B.A. Core

(24 hours)

These courses are required of all students. They are reflective of business techniques, methodology and processes, and are designed to be cross-functional and integrative.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUAD 6100</td>
<td>Accounting For Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6200</td>
<td>Financial Systems</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6300</td>
<td>Strategic Marketing And Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

Elective Courses

(Minimum 9 hours)

Each student may select up to two majors. An alternative is to select the general administration major described below, which is designed for students who prefer to take a variety of electives in different areas. The substitution of any courses for a major requires the written approval of the appropriate Department Chair. No more than one independent study/research paper (three hours) may be taken in lieu of a course to fulfill a specialization requirement, and no more than one course will be allowed to count towards two majors in the M.B.A. program.

Ph.D. in Manufacturing and Technology Management (Ph.D.)

The purpose of the Ph.D. program is to train scholars to meet traditional standards of excellence in, and contribute to, the manufacturing and technology management field through research, teaching and publication in academic and professional journals. Within this broad field, students can specialize in either (i) operations and supply chain management or (ii) information systems. The program is designed for individuals who seek to contribute to the advancement and dissemination of knowledge in manufacturing and technology management through an integrative approach with sound foundations in business, technology, and research methodology. Graduates are expected to pursue careers in academia, consulting, research or manufacturing organizations.

The basic philosophy underlying the doctoral program is that researchers in manufacturing and technology management require a careful and creative mix of functional management specialties, economics, technology, supply chain management, manufacturing, commercialization, and information technologies. Regardless of track, students must become experts in applying analytical tools such as statistics, optimization and research methodology. Therefore, the program is designed to provide students with abilities and skills to integrate and synthesize these diverse yet important related areas.

Doctor of Philosophy in Manufacturing and Technology Management (Ph.D.)

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-calculation at the graduate level; as such,
repeated courses will have both grades included in the cumulative GPA calculation.

The program requires at least 93 semester hours of study beyond the baccalaureate. For a full-time student with only a bachelor’s degree, the course requirements before entering the dissertation stage can be completed in three years. Full-time students with an M.B.A. or a relevant M.S. degree should be able to complete the course work in two years before entering the dissertation stage. During the first year, the students without prior appropriate undergraduate or graduate work in business or engineering will acquire the foundation knowledge in business, engineering, and manufacturing technology. Course waivers are possible at the foundation stage by passing competency examinations in appropriate areas.

Admission to Doctor of Philosophy in Manufacturing and Technology Management (Ph.D.) Program*

Applicants with a master’s degree in a technical field or business are preferred. Applicants with a bachelor’s degree in a technical field or business may also be considered. Letters of reference from college faculty or employers acquainted with the student’s character and ability, and official transcripts of all prior college work must be supplied. Applicants are expected to demonstrate preparation for, and a high promise of, success in the doctoral program.

The following will be considered in evaluating an application to the Ph.D. program on an individual basis:

- The student’s undergraduate and graduate record with general academic performance, as well as the trend and comparison of grades over a period of time;
- The student’s verbal, quantitative and total scores on the GMAT (in certain cases, depending on the academic background of the student, GRE scores may be substituted for GMAT scores);
- Evidence of the ability to do research (publications, presentations, etc.);
- Statement of purpose explaining why the student wants to pursue a Ph.D. in manufacturing and technology management;
- Three letters of reference;
- Appropriate experience;
- And, in the case of students whose native language is not English, acceptable performance on the TOEFL or IELTS is mandatory.

It is to be stressed that, although GMAT and GPA are important, they alone will not be the basis of admissions decisions. While students may come from many academic disciplines, those students with bachelor’s degrees in fields other than business may require more than 93 semester hours in order to satisfy prerequisite and business foundations course requirements. Students admitted to the Ph.D. program will not receive graduate credit for any undergraduate courses they take.

A student should take the Ph.D. comprehensive examination as soon as he/she and his/her adviser believes the student has mastered all the required subject areas and completed all course work. The format and other details of the examination are given in the handbook for Ph.D. students and are available on-line. Following successful completion of the comprehensive examination, the student is admitted to candidacy for the Ph.D. and undertakes dissertation research. The student is responsible for initiating the application to candidacy on a form available from the College of Graduate Studies.

When a student enters the program, the Ph.D. program director will help the student in preparing a plan of study. Each student will be assigned a faculty adviser by the Ph.D. program director at the time of admission. During this first year of study, the student will choose an adviser who will assist the student in choosing a dissertation topic, forming a dissertation committee and in other matters concerning the program. More information is available at: http://www.utoledo.edu/business/PHD/index.html.

*No new students are being accepted into this program at the present time.

Prerequisites

- One year of calculus
- Statistics that include regression and analysis of variance
- One academic term of computer systems with applications
- Micro- and Macro-economics
- Some knowledge of computer programming for IS-track candidates

Prerequisites should be completed before starting the Ph.D. program.

Business Foundation Courses

(19 hours)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 5000</td>
<td>Financial And Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 5810</td>
<td>Econometrics Models And Methods I</td>
<td>4</td>
</tr>
<tr>
<td>BUAD 6400</td>
<td>Results-Based Management</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6800</td>
<td>Information Technology And E-Business</td>
<td>3</td>
</tr>
<tr>
<td>MKTG 5410</td>
<td>Marketing Systems</td>
<td>3</td>
</tr>
<tr>
<td>OSCM 5520</td>
<td>Analysis of Manufacturing and Service Systems</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
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</table>

Ph.D. Program Curriculum

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFGM 8630</td>
<td>Management Science</td>
<td></td>
</tr>
<tr>
<td>MFGM 8860</td>
<td>Advanced Statistics</td>
<td></td>
</tr>
<tr>
<td>MFGM 8880</td>
<td>Research Methods-Theory Bldg</td>
<td></td>
</tr>
<tr>
<td>MFGM 8870</td>
<td>Seminar in Statistics/ Research Method</td>
<td></td>
</tr>
<tr>
<td>RESM 6150/8150</td>
<td>Structural Equation Modeling</td>
<td></td>
</tr>
<tr>
<td>MFGM 8640</td>
<td>Advanced Management Science</td>
<td></td>
</tr>
<tr>
<td>MFGM 8650</td>
<td>Stochastic Modeling</td>
<td></td>
</tr>
<tr>
<td>MFGM 8660</td>
<td>Qualitative Research Methodology</td>
<td></td>
</tr>
<tr>
<td>MFGM 8670</td>
<td>Special Topics in Research Methods</td>
<td></td>
</tr>
</tbody>
</table>

Plus two from the following:

- MFGM 8880 | Research Methods-Theory Bldg                       |
- MFGM 8870 | Seminar in Statistics/ Research Method              |
- RESM 6150/8150 | Structural Equation Modeling                      |
- MFGM 8630 | Management Science                                 |
- MFGM 8860 | Advanced Statistics                                |
- MFGM 8650 | Stochastic Modeling                                |
- MFGM 8660 | Qualitative Research Methodology                   |
- MFGM 8670 | Special Topics in Research Methods                 |

Major Field: Integrative Seminars

- MFGM 8480 | Management of Technology                           |
- MFGM 8980 | Special Topics Seminar                             |
INFS 8990 Integrative Seminar in IT

The students can choose one of the two tracks: 1) Operations and Supply Chain Management, or 2) Information Systems. These are graduate level courses and seminars.

Operations and Supply Chain Management Track

- MFGM 8490 Supply Chain and E-Business Issues in Manufacturing
- MFGM 8890 Advanced Manufacturing Systems
- OSCM 6680/8690 Quality Management and Six Sigma
- OSCM 6690 Supply Chain Resources Management

Information Systems Track

- INFS 6560 Systems Analysis And Design
- INFS 6150/8150 Business Intelligence Management
- INFS 6710/8710 Management of Information Systems Security
- INFS 8760 IS Research Seminar I
- INFS 8770 IS Research Seminar II

Dissertation

- MFGM 8960 Dissertation

1 The minor will be a supporting field of three courses at the master's (M.B.A.) level, and a related advanced seminar with the objective of integrating the Manufacturing and Technology Management major field with developments in the minor field of interest.

Dissertation Research

The dissertation must be based on work initiated and undertaken specifically for that purpose. It must reflect a high level of scholarship, must constitute a substantial piece of work, and must indicate and document its claim to be a significant contribution to knowledge in its subject area.

Details regarding the dissertation research, starting with the dissertation proposal and ending with the final defense, are available in the handbook for Ph.D. students, which is available on the Ph.D. website. http://www.utoledo.edu/business/PHD/index.html.

Department of Marketing and International Business

Thomas Sharkey, Chair

Degrees Offered

- MBA International Business (p. 83)
- MBA Marketing (p. 83)

IBUS 6100 Study Abroad Program

[3 credit hours (0, 0, 3)]
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 6360 Management Of Multinational Firms

[3 credit hours (3, 0, 0)]
Analysis of the multinational firm, emphasizing the differences with domestic enterprises, with respect to strategic planning and capital allocation, marketing, production, supply, personnel and contract negotiation.

Term Offered: Spring, Fall

IBUS 6990 Independent Study

[1-3 credit hours (0, 0, 0-3)]
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

IBUS 8490 Global Management Systems

[3 credit hours (3, 0, 0)]
Compares the management philosophies, systems and methods of U.S. firms with those of firms from other countries, particularly the management system of Japanese, German and other nationality firms that are competitors of U.S. firms. Ph.D. students are assigned additional readings from the academic literature.

IBUS 8790 International Business Research Seminar

[3 credit hours (0, 0, 3)]
A seminar in selected topics in International Business. PhD. students are assigned readings from the International Business academic literature. They will complete several research papers focusing on specific topics that advance the field and that are suitable for submission to an academic journal or conference.

Term Offered: Spring, Fall

MKTG 5170 Marketing For Non-Profit Organizations

[3 credit hours (3, 0, 0)]
This course is an introduction to marketing for non-business students. Focus is on planning and executing marketing programs in not-for-profit organization. It is an accelerated look into marketing principles which focuses on the opportunities, challenges, and constraints confronting managers in not-for-profit settings – health care institutions, schools, churches, arts and community service organizations in the governmental and private sectors.

Term Offered: Spring, Fall

MKTG 5410 Marketing Systems

[3 credit hours (3, 0, 0)]
Examines the areas of marketing management, marketing functions and institutions, and the role of marketing in the organization. The course explores the relationship between marketing and the environment.

Term Offered: Spring, Summer, Fall

MKTG 6140 Customer Relationship Marketing

[3 credit hours (3, 0, 0)]
Course will examine the theoretical and managerial development of relationship marketing as an organizational strategy to build and maintain profitable customer relationships.

Prerequisites: BUAD 3010 or MKTG 5410

Term Offered: Summer, Fall
MKTG 6220 Integrated Marketing Communications  
[3 credit hours (3, 0, 0)]
Course focuses on the integration of marketing communication tools in achieving desired changes in consumer attitudes and behaviors. This involves analyzing the competitive environment, defining the communications strategy and selecting media and vehicles to ensure consistency of messages and complementary use of media in order to maximize the impact on consumers.
Prerequisites: MKTG 5410 or BUAD 3010  
Term Offered: Summer, Fall

MKTG 6230 Digital Marketing Processes and Virtual Value Networks  
[3 credit hours (0, 0, 3)]
Course will examine how marketing processes can leverage e-commerce opportunities to create greater customer value in relational and transactional exchanges, and to build virtual value networks spanning functional, organizational and geographical boundaries.
Prerequisites: MKTG 5410 or BUAD 3010  
Term Offered: Spring

MKTG 6240 Sales Force Leadership and Strategy  
[3 credit hours (3, 0, 0)]
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 or BUAD 3010  
Term Offered: Spring, Summer, Fall

MKTG 6250 Global Sales and Strategic Customer Management  
[3 credit hours (3, 0, 0)]
In today’s global business environment, it has become a strategic necessity for salespeople to take an approach centered on developing customer relationships. This course examines the roles and functions of the business-to-business salesperson in managing customers in a global environment and considered strategic to meeting organizational goals. Students will participate in critical thinking exercises, case study, and role play to develop skills in relationship selling, and strategic customer management of global firms.
Prerequisites: MKTG 5410 or BUAD 3010  
Term Offered: Spring

MKTG 6310 Managing Innovation and Product Commercialization  
[3 credit hours (3, 0, 0)]
Course will provide an understanding of how new products and services are designed and commercialized, and will take a strategic and managerial perspective in defining how to best plan, lead, and develop the processes of managing innovation and new products/services.
Prerequisites: BUAD 3010 or MKTG 5410

MKTG 6320 Strategic Brand Management  
[3 credit hours (3, 0, 0)]
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.
Prerequisites: MKTG 5410 or BUAD 3010  
Term Offered: Spring, Summer, Fall

MKTG 6400 International Marketing  
[3 credit hours (3, 0, 0)]
This course focuses on identifying (via screening) and servicing foreign market opportunities via the export modality. Skills in research, strategic and tactical analysis, and adaptation are developed.
Prerequisites: BUAD 3010 or MKTG 5410  
Term Offered: Spring, Fall

MKTG 6980 Special Topics  
[3 credit hours (0, 0, 3)]
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 (0, 0, 0-3)]
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

MKTG 8240 Sale Force Leadership and Strategy  
[3 credit hours (3, 0, 0)]
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  
Term Offered: Spring

MKTG 8250 Strategic Account Management  
[3 credit hours (3, 0, 0)]
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  
Term Offered: Spring

MKTG 8290 Business Marketing  
[3 credit hours (3, 0, 0)]
Nature, structure, and managerial problems and processes in the field of business-to-business marketing.
Prerequisites: MKTG 5410 or MKTG 7410

MKTG 8310 Managing Innovation and Product Commercialization  
[3 credit hours (0, 0, 3)]
Course will provide an understanding of how new products and services are designed and commercialized, and will take a strategic and managerial perspective in defining how to best plan, lead, and develop the processes of managing innovation and new products/services.
Prerequisites: MKTG 5410  
Term Offered: Spring
MKTG 8320 Strategic Brand Management
[3 credit hours (3, 0, 0)]
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.
Prerequisites: MKTG 5410
Term Offered: Spring

MKTG 8400 International Marketing
[3 credit hours (3, 0, 0)]
This course focuses developing an eclectic knowledge of the literature on identifying and servicing foreign market opportunities. Research skills dealing with literature synthesis, concept development, testing, data collection and academic paper writing are developed.
Prerequisites: BUAD 6500

MKTG 8790 Integrated Marketing/CRM Seminar
[3 credit hours (0, 0, 3)]
A seminar in selected topics in Marketing. Ph.D. students are assigned readings from the Marketing academic literature. They will complete several research papers focusing on specific topics that advance the field and that are suitable for submission to an academic journal or conference.
Term Offered: Spring, Fall

MBA International Business
Common Body of Knowledge
(18 hours maximum)
These courses represent the minimum background required of students prior to taking 6000-level courses in the M.B.A. program. Students admitted to the M.B.A. program can meet the requirements by taking the 5000-level courses or by proficiency examination. If a student can demonstrate that he/she has 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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 5000</td>
<td>Financial And Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>FINA 5210</td>
<td>Economics For Business Decisions</td>
<td>3</td>
</tr>
<tr>
<td>FINA 5310</td>
<td>Managerial Finance</td>
<td>3</td>
</tr>
<tr>
<td>MKTG 5410</td>
<td>Marketing Systems</td>
<td>3</td>
</tr>
<tr>
<td>OSCM 5510</td>
<td>Business Statistics With Computer Applications</td>
<td>3</td>
</tr>
<tr>
<td>OSCM 5520</td>
<td>Analysis of Manufacturing and Service Systems</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

M.B.A. Core
(24 hours)
These courses are required of all students. They are reflective of business techniques, methodology and processes, and are designed to be cross-functional and integrative.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBUS 6360</td>
<td>Management Of Multinational Firms (Fall)</td>
<td>3</td>
</tr>
<tr>
<td>MKTG 6400</td>
<td>International Marketing (Spring) 1</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>IBUS 6100</td>
<td>Study Abroad Program (Spring)</td>
<td></td>
</tr>
<tr>
<td>FINA 6370</td>
<td>MBA International Financial Management</td>
<td></td>
</tr>
<tr>
<td>MKTG 6250</td>
<td>Global Sales and Strategic Customer Management (Spring) 1</td>
<td></td>
</tr>
<tr>
<td>MKTG 6980</td>
<td>Special Topics (Varies; please consult an advisor as to appropriateness of topic in international setting)</td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

1 Offered online section only.

MBA Marketing
**Common Body of Knowledge**

(18 hours maximum)

These courses represent the minimum background required of students prior to taking 6000-level courses in the M.B.A. program. Students admitted to the M.B.A. program can meet the requirements by taking the 5000-level courses or by proficiency examination. If a student can demonstrate that he/she has 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.

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<tr>
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<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
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<td>Financial And Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>FINA 5210</td>
<td>Economics For Business Decisions</td>
<td>3</td>
</tr>
<tr>
<td>FINA 5310</td>
<td>Managerial Finance</td>
<td>3</td>
</tr>
<tr>
<td>MKTG 5410</td>
<td>Marketing Systems</td>
<td>3</td>
</tr>
<tr>
<td>OSCM 5510</td>
<td>Business Statistics With Computer Applications</td>
<td>3</td>
</tr>
<tr>
<td>OSCM 5520</td>
<td>Analysis of Manufacturing and Service Systems</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Hours</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

**M.B.A. Core**

(24 hours)

These courses are required of all students. They are reflective of business techniques, methodology and processes, and are designed to be cross-functional and integrative.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUAD 6100</td>
<td>Accounting For Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6200</td>
<td>Financial Systems</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6300</td>
<td>Strategic Marketing And Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6400</td>
<td>Results-Based Management</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6500</td>
<td>International Business</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6600</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6800</td>
<td>Information Technology And E-Business</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6900</td>
<td>Strategic Management Capstone</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Hours</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

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 core class with an M.B.A. elective of their choice.

**Elective Courses**

(Minimum 9 hours)

Each student may select up to two majors. An alternative is to select the general administration major described below, which is designed for students who prefer to take a variety of electives in different areas. The substitution of any courses for a major requires the written approval of the appropriate Department Chair. No more than one independent study/research paper (three hours) may be taken in lieu of a course to fulfill a specialization requirement, and no more than one course will be allowed to count towards two majors in the M.B.A. program.

**Marketing**

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 two areas of concentration: Marketing Management and Professional Sales. While it is not possible for a specific concentration to be listed on the official transcript, students majoring in Marketing must complete one of two tracks.

**Marketing Management**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKTG 6140</td>
<td>Customer Relationship Marketing (Fall, Summer)</td>
<td>3</td>
</tr>
<tr>
<td>MKTG 6220</td>
<td>Integrated Marketing Communications (Fall, Summer)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Select one of the following:</strong></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>IBUS 6100</td>
<td>Study Abroad Program (Varies)</td>
<td></td>
</tr>
<tr>
<td>MKTG 6240</td>
<td>Sales Force Leadership and Strategy (Fall)</td>
<td>2</td>
</tr>
<tr>
<td>MKTG 6250</td>
<td>Global Sales and Strategic Customer Management (Spring)</td>
<td>2</td>
</tr>
<tr>
<td>MKTG 6320</td>
<td>Strategic Brand Management (Varies)</td>
<td></td>
</tr>
<tr>
<td>MKTG 6400</td>
<td>International Marketing (Spring)</td>
<td>2</td>
</tr>
<tr>
<td>MKTG 6980</td>
<td>Special Topics (Varies)</td>
<td></td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>

1 Offered at least one live and one online section per year.
2 Offered online section only.

**Professional Sales**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKTG 6240</td>
<td>Sales Force Leadership and Strategy (Fall)</td>
<td>3</td>
</tr>
<tr>
<td>MKTG 6250</td>
<td>Global Sales and Strategic Customer Management (Spring)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Select one of the following:</strong></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>IBUS 6100</td>
<td>Study Abroad Program (Spring)</td>
<td></td>
</tr>
<tr>
<td>MKTG 6140</td>
<td>Customer Relationship Marketing (Fall, Summer)</td>
<td>1</td>
</tr>
<tr>
<td>MKTG 6220</td>
<td>Integrated Marketing Communications (Fall, Summer)</td>
<td>2</td>
</tr>
<tr>
<td>MKTG 6980</td>
<td>Special Topics (Varies)</td>
<td></td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>

1 Offered at least one live and one online section per year.
2 Offered online section only.

**Dual Degrees**
Degrees Offered

- B.A./M.B.A. Dual Degree (p. 85)
- B.S./M.B.A. Dual Degree (p. 85)
- J.D./M.B.A. Dual Degree (p. 85)
- M.D./M.B.A. Dual Degree (p. 86)
- M.P.H./M.B.A. Dual Degree (p. 86)
- PharmD./M.B.A. Dual Degree (p. 86)

B.A./M.B.A. Dual Degree

The College of Business and Innovation in conjunction with the College of Arts and Letters offers a plan of study for students wishing to major in Disability Studies (DST), minor in Business, and transition into the M.B.A program. This program provides a unique opportunity to combine undergraduate studies in business and social science in preparation for further graduate studies in business. This plan of study will guide student toward completing their undergraduate studies (major in DST/minor in business) by the end of their 7th semester and completing their M.B.A. by their 10th semester.

Students who wish to pursue this plan of study should meet with both their undergraduate College of Arts and Letters advisor and the COBI Undergraduate Student Service office as early as possible to plan a course sequence to fit the recommended timelines of this plan of study to meet the business minor and apply toward the MBA program. Interested students will take the GMAT at the end of their junior year and 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, score a minimum of 450 on the GMAT, and have at least a 2.7 cumulative GPA. Undergraduate requirements for the general business minor must also be completed. Interested students will also be working with the COBI Graduate Programs Office to assist with the transition process.

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 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.

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 18 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 18 hours of Common Body of Knowledge course work from the College of Engineering with a business minor toward satisfaction of the M.B.A. program requirements. The business minor courses should be chosen carefully to be used specifically toward the M.B.A. Common Body of Knowledge courses. All courses taken in the College of Engineering that are applied towards the M.B.A. program requirements must be earned with a grade of C (2.0) or higher. Students may opt for MIME 2600 to satisfy FINA 5210.

This program will allow engineering students, in their final two semesters of study, to be taking M.B.A. 6000-level courses. The Common Body of Knowledge course requirements will be satisfied as part of the successful completion of the undergraduate level equivalent. 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 will take the GMAT at the end of their junior year and should apply for admission to the M.B.A. 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, score a minimum of 450 on the GMAT, and have at least a 3.0 cumulative GPA. Undergraduate requirements for the general business minor 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 taking graduate courses as a Provisional Admission status while simultaneously completing senior year requirements for the B.S. in engineering.

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 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 has been completed.

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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUAD 6100</td>
<td>Accounting For Decision Making</td>
<td>12</td>
</tr>
<tr>
<td>BUAD 6200</td>
<td>Financial Systems (Financial Systems)</td>
<td></td>
</tr>
<tr>
<td>BUAD 6300</td>
<td>Strategic Marketing And Analysis</td>
<td></td>
</tr>
<tr>
<td>BUAD 6500</td>
<td>International Business</td>
<td></td>
</tr>
<tr>
<td>BUAD 6800</td>
<td>Information Technology And E-Business</td>
<td></td>
</tr>
<tr>
<td>BUAD 6900</td>
<td>Strategic Management Capstone</td>
<td></td>
</tr>
<tr>
<td>EFSB 6590</td>
<td>New Venture Creation</td>
<td></td>
</tr>
<tr>
<td>EFSB 6690</td>
<td>Technology Commercialization</td>
<td></td>
</tr>
<tr>
<td>EFSB 6790</td>
<td>Venture Capital Finance</td>
<td></td>
</tr>
<tr>
<td>FINA 6130</td>
<td>Advanced Corporate Finance</td>
<td></td>
</tr>
<tr>
<td>FINA 6140</td>
<td>Investments And Security Analysis</td>
<td></td>
</tr>
<tr>
<td>FINA 6150</td>
<td>Financial Institutions And Markets</td>
<td></td>
</tr>
</tbody>
</table>
### 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 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 18 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 approved M.D. coursework to be credited toward the M.B.A. degree.

### 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./M.P.H. 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 Master of Public Health degree is awarded by the College of Health and Human Services, and the M.B.A. is awarded by the 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 18 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.

### PharmD./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 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 18 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 approved M.B.A. coursework to be credited toward the M.B.A. degree.

---

#### Code Title Hours

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>FINA 6370</td>
<td>MBA International Financial Management</td>
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<tr>
<td>IBUS 6360</td>
<td>Management Of Multinational Firms</td>
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<tr>
<td>MGMT 6160</td>
<td>Leading With Power and Influence</td>
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</tr>
<tr>
<td>HURM 6720</td>
<td>Advanced Negotiation and Conflict Management</td>
<td>9</td>
</tr>
<tr>
<td>HURM 6760</td>
<td>Talent Management</td>
<td></td>
</tr>
<tr>
<td>INF 6810</td>
<td>Network Communications</td>
<td></td>
</tr>
<tr>
<td>MKTG 6140</td>
<td>Customer Relationship Marketing</td>
<td></td>
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<tr>
<td>MKTG 6400</td>
<td>International Marketing</td>
<td></td>
</tr>
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<td>LAW 6000</td>
<td>MBA Core course</td>
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<tr>
<td>LAW 6100</td>
<td>MBA Core course</td>
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</tr>
<tr>
<td>LAW 9010</td>
<td>Business Associations</td>
<td>9</td>
</tr>
<tr>
<td>LAW 9010</td>
<td>Business Associations</td>
<td>9</td>
</tr>
<tr>
<td>LAW 9060</td>
<td>Sales and Leases of Goods</td>
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<tr>
<td>LAW 9300</td>
<td>Employment Discrimination</td>
<td></td>
</tr>
<tr>
<td>LAW 9730</td>
<td>Pension and Employee Benefits</td>
<td></td>
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<tr>
<td>LAW 9100</td>
<td>Employment Law</td>
<td></td>
</tr>
<tr>
<td>LAW 9940</td>
<td>White Collar Crime</td>
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</tr>
<tr>
<td>LAW 9050</td>
<td>Negotiation and Settlement</td>
<td></td>
</tr>
<tr>
<td>LAW 9210</td>
<td>Contracts I</td>
<td>9</td>
</tr>
<tr>
<td>LAW 9220</td>
<td>Contracts II</td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>
first year in the PharmD program and the student’s junior year, were they would begin their coursework towards the M.B.A. The following table identifies each M.B.A. course and describes how the student will complete the work.

M.B.A. Pre-requisites

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 5000</td>
<td>Financial And Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>FINA 5210</td>
<td>Economics For Business Decisions (economics)</td>
<td>3</td>
</tr>
<tr>
<td>FINA 5310</td>
<td>Managerial Finance (finance)</td>
<td>3</td>
</tr>
<tr>
<td>MKTG 5410</td>
<td>Marketing Systems</td>
<td>3</td>
</tr>
<tr>
<td>OSCM 5510</td>
<td>Business Statistics With Computer Applications</td>
<td>3</td>
</tr>
<tr>
<td>OSCM 5520</td>
<td>Analysis of Manufacturing and Service Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Courses Take by PharmD Students

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUAD 2040</td>
<td>Financial Accounting Information &amp; Accounting For Decision-Making</td>
<td>6</td>
</tr>
<tr>
<td>BUAD 3040</td>
<td>Principles Of Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>ECON 1150</td>
<td>Principles Of Macroeconomics &amp; ECON 1200 Principles Of Microeconomics</td>
<td>6</td>
</tr>
<tr>
<td>BUAD 3010</td>
<td>Principles Of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>PHPR 4330</td>
<td>RESEARCH DESIGN AND DRUG LITERATURE EVALUATION 1</td>
<td></td>
</tr>
<tr>
<td>PHPR 6340</td>
<td>RESEARCH DESIGN AND DRUG LITERATURE EVALUATION 2</td>
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<tr>
<td>BUAD 3020</td>
<td>Principles Of Manufacturing And Service Systems</td>
<td>3</td>
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Select one of the following:

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<th>Hours</th>
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</table>

Total Hours

M.B.A. Curriculum

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUAD 6100</td>
<td>Accounting For Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6200</td>
<td>Financial Systems</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6300</td>
<td>Strategic Marketing And Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6400</td>
<td>Results-Based Management</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6500</td>
<td>International Business</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6600</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6800</td>
<td>Information Technology And E-Business</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6900</td>
<td>Strategic Management Capstone</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
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<td>9</td>
</tr>
</tbody>
</table>

Courses Take by PharmD Students

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BUAD 6100</td>
<td>Accounting For Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6200</td>
<td>Financial Systems</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6300</td>
<td>Strategic Marketing And Analysis</td>
<td>3</td>
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<tr>
<td>BUAD 6400</td>
<td>Results-Based Management</td>
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<tr>
<td>BUAD 6500</td>
<td>International Business</td>
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<td>BUAD 6600</td>
<td>Supply Chain Management</td>
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</tr>
<tr>
<td>BUAD 6800</td>
<td>Information Technology And E-Business</td>
<td>3</td>
</tr>
</tbody>
</table>

BUAD 6900 Strategic Management Capstone 3

Advanced Pharmacy Practice Experience (PHPR 8940) 12

Total Hours 69

This plan of study would result in the student having a M.B.A. major in General 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

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Semester</th>
<th>Spring Semester</th>
<th>Summer Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre-prof</td>
<td>Pre-prof</td>
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<tr>
<td></td>
<td>Pharmacy</td>
<td>Pharmacy</td>
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</tr>
<tr>
<td></td>
<td>Courses</td>
<td>Courses</td>
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</tr>
<tr>
<td>2</td>
<td>Pre-prof</td>
<td>Pre-prof</td>
<td>1 PharmD Course</td>
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<tr>
<td></td>
<td>Pharmacy</td>
<td>Pharmacy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Courses</td>
<td>Courses</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PharmD Coursework</td>
<td>PharmD Coursework</td>
<td>BBA Coursework</td>
</tr>
<tr>
<td>4</td>
<td>PharmD Coursework</td>
<td>PharmD Coursework</td>
<td>1 PharmD Course</td>
</tr>
<tr>
<td>5</td>
<td>PharmD Coursework</td>
<td>PharmD Coursework</td>
<td>M.B.A. Coursework</td>
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<tr>
<td></td>
<td>1 M.B.A. course</td>
<td>1 M.B.A. course</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>APPE Experiences</td>
<td>APPE Experiences</td>
<td></td>
</tr>
</tbody>
</table>

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

Graduate Degrees/Certificates Offered

The 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 College of Business and Innovation offers the following degrees at the graduate level:

- Master of Business Administration (M.B.A.)
- A dual Juris Doctor/Master of Business Administration (J.D./ M.B.A.)
- A dual Doctor of Medicine/Master of Business Administration (M.D./ M.B.A)
- A dual Master of Public Health/Master of Business Administration (M.PH/M.B.A)
Graduate Degrees/Certificates Offered

- A dual Pharmacy/Master of Business Administration (Pharm.D./M.B.A.)
- A dual Bachelor of Science in Engineering/Master of Business Administration (B.S./M.B.A)
- A joint Bachelor of Arts in Disability Studies/Master of Business Administration (Plan of Study)
- Master of Science in Accountancy (M.S.A.)
- Doctor of Philosophy in Manufacturing and Technology Management (Ph.D.)

Specializations within the Master of Business Administration Program
- Administration
- Technological Entrepreneurship
- Finance
- Healthcare Systems Management: Public Health
- Human Resource Management
- Information Systems
- International Business
- Leadership
- Marketing: Marketing Management or Professional Sales
- Operations Management

Specializations within THE MASTER OF SCIENCE IN ACCOUNTANCY
- General Track
- Auditing and IT Track
- Financial Reporting and Finance Track
- Strategic Management Track
- Accounting and Operations Management Track

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.
COLLEGE OF ENGINEERING

2018-2019 Graduate Catalog

Welcome to the College of Engineering Office of Graduate Studies. The UT College of Engineering offers 2 PhD programs and 8 different Masters degrees, including the 100% online Masters in General Engineering and the new Masters in General Engineering with a concentration in Energy Engineering. Our traditional on-campus programs give students preparation for research and advanced engineering careers.

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Fax: 419.530.8006
michael.toole@utoledo.edu (nagi.naganathan@utoledo.edu)

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Patricia Mowery, Director of Administrative Operations
Phone: 419.530.8000
patricia.mowery@eng.utoledo.edu (pmowery@eng.utoledo.edu)

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Fax: 419.530.7392
patricia.relue@utoledo.edu (mhefzy@eng.utoledo.edu)

College Policies (Graduate Handbook)

The College of Engineering offers graduate programs in bioengineering, chemical, civil and environmental, computer science and engineering, electrical, general, and industrial and mechanical engineering. In addition, and jointly with the College of Medicine and Life Sciences, the College of Engineering also offers a graduate program in biomedical engineering. Requirements for the engineering graduate programs are identified below. In addition, students should be familiar with the general College of Graduate Studies requirements.

Entrance Requirements

The graduate program is 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 in previous undergraduate work and at least 3.3 in previous graduate work. Students with a degree in another field may be eligible for admission, provided they meet the minimum background requirement, which 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.

An applicant for admission must do the following:

1. Submit a completed application for admission to the College of Graduate Studies.
2. Submit the application for graduate assistantship to the College of Graduate Studies.
3. Submit a complete financial statement (for international students).
4. Pay the relevant application fee.
5. Submit three letters of recommendation.
6. Submit a statement of purpose on the application and indicate those areas of engineering in which the applicant is interested.
7. Submit official transcripts of all previous college-level work.
8. Submit scores of the Graduate Record Exam (GRE), if required.
9. All students from non-English speaking countries must submit scores for the Test of English as a Foreign Language (TOEFL). The minimum acceptable score for the TOEFL is 550 (for paper-based test) or 213 (for computer-based test) or 80 (for internet-based test).

The above documentation should be submitted to the College of Graduate Studies. Admission to the graduate program is contingent on the availability of openings for incoming students. To receive full consideration for financial support starting from the fall semester, the application should be received by March 15. Normally, however, all applications are considered as they are received. Because of the sequential nature of courses, full-time students are admitted for the fall semester of the academic year. Please be advised that only complete application files will be considered.

COGS Graduate Student Handbook (http://www.utoledo.edu/graduate/files/Graduate%20Student%20Handbook%202015-2016.pdf)

- College Policies and Procedures (p. 392)
- Academic Regulations (p. 394)
- Other Policies and Information (p. 399)

Admission

Except for the biomedical engineering program, application for admission should be made to one of the engineering departments for study in specific focus areas. Applications to the biomedical engineering program should be made to this specific program. Application materials should be submitted directly to the College of Graduate Studies.

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, which are listed in their departmental descriptions. 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 option of the department. All students from non-English speaking countries must submit scores for the TOEFL; some departments will require completion of the GRE, as well. Application
Master of Science Programs

The master's degree programs are intended to provide advanced study in a relevant 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 interdepartmental studies through a thesis or project.

Plan of Study

The master of science in engineering, master of science in bioengineering, master of science in chemical engineering, master of science in civil engineering, master of science in electrical engineering, master of science in industrial engineering, and master of science in mechanical engineering are offered with the following options:

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. Additional guidelines and requirements may exist for individual departments.

2. Master of science degree with 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.

   a. Master of science degree with project option: Students are required to complete 30 credit hours of approved graduate study, including six hours of master of science project as specified by 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. 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. The master of science degree in chemical engineering has an additional non-thesis option, a Professional Science Masters in Green Chemistry and Engineering, that requires 30 credit hours of approved graduate-level course work and 6 hours on internship.

A plan of study that specifies the entire master's program to include thesis or project and graduate course work, as well as any specified preparatory undergraduate course work, is to be developed by the student working with his/her adviser. This plan of study is to be submitted for review and approval to the department's graduate director, the department chair, the college's associate dean of graduate studies, and the College of Graduate Studies before 10 graduate credits are completed. Graduate course work is selected from that available in engineering, math, science, business and related fields to include required core courses and/or to satisfy course category restrictions specified by the individual programs. Students should consult the departmental program descriptions for additional requirements.

In order to be awarded the Master of Science 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.

**Doctoral Degree Program**

The doctor of philosophy program in the College of Engineering is intended for academically outstanding students with appropriate bachelor’s degrees. The program requires the completion and defense of a significant, original research dissertation. Potential fields of study are designated as areas of research focus by individual departments. Potential concentrations are bioengineering, chemical engineering, civil engineering, computer science and engineering, electrical engineering, environmental engineering, industrial engineering, manufacturing engineering, and mechanical engineering.

**Advisory Committee**

Doctoral students, in consultation with the graduate program director and departmental chair, should select an adviser during their first term of study. Since the adviser 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 adviser can work effectively together. Notification of the adviser’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 for approval.

When the student and adviser have agreed on a general area for the dissertation within the first year of study, 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 of whom from outside the focus area and one from outside the department of the adviser. 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 manuscript; 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 develop and submit for approval a doctoral program plan of study that meets all University, college and departmental requirements. This document specifies the course work and other requirements for the Ph.D.; it sets a tentative schedule for the examinations, and for presentation and defense of the dissertation proposal. Submission of the plan of study for approval to the graduate director, the departmental chair and the College of Graduate Studies also accomplishes official appointment of the advisory committee.

The plan of study requires a minimum of 45 credit hours each of dissertation and course work. (Students admitted to the Ph.D. program with an M.S. degree are granted up to 30 course work credits for their M.S. degree.) Course work must satisfy core course and other requirements specified for the student’s focus area by the department.

In order to be awarded the Ph.D. 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.

**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.

Doctoral students satisfy the doctoral residency requirement by completing at 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 should be requested to the College of Graduate Studies on the “Residency Requirement Exception Form (p. 398)” that should be attached to a Plan of Study for students who have been determined by their academic program to need an exception to the residency requirement.

**Examinations**

At the discretion of the student’s department, either a qualifying examination, a comprehensive examination or both will be required prior to admission to candidacy. Please refer to departmental and University requirements for details of the qualifying or comprehensive examinations.

**Admission to Candidacy**

When notified the required qualifying or comprehensive examination(s) have been passed and all other departmental requirements for candidacy are fulfilled, the student should initiate formal admission to candidacy. This requires the signed approval of the graduate program director and department chair and notification to the College of Graduate Studies.

**Dissertation Proposal**

The student, working with the adviser, 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 adviser and committee have approved the dissertation proposal, the student should carry out the dissertation plan. When the adviser and student believe the work is complete and ready for defense, a dissertation manuscript should be prepared, with the adviser providing suggestions.
for improvement, until both the adviser and the student believe the document is ready for publication.

The student should distribute the final adviser-approved manuscript and schedule a defense before the advisory committee.

The defense is open to the public. Notice of the exam should be sent to the departmental 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 bulletin boards.

Following the 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 before another defense is scheduled. When the examination is passed, there are generally revisions for improvement to be implemented before final approval of the document. When the final corrected, signed dissertation is submitted to the College of Graduate Studies through the departmental graduate director, the department chair and the associate dean of graduate studies, the student is certified academically for graduation.

Departments

- Department of Bioengineering (p. 92)
- Department of Chemical and Environmental Engineering (p. 95)
- Department of Civil and Environmental Engineering (p. 99)
- Department of Electrical Engineering and Computer Science (p. 104)
- Department of Mechanical, Industrial, and Manufacturing Engineering (p. 112)

Department of Bioengineering

Arunan Nadarajah, chair and acting 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 manufacture of bio-related products.

Achievement of these goals requires engineering graduates who are trained in engineering and the life sciences. The department of bioengineering is multidisciplinary in nature. It draws 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 departments on the UT Health Science Campus and other area medical institutions.

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. The Department of Bioengineering requires the GRE of all students for admission decisions to graduate programs.

Degrees Offered

- M.S. in Bioengineering (p. 94)
- Ph.D. in Bioengineering (p. 94)

BIOE 5200 Physiology And Anatomy For Bioengineers
[3 credit hours (3, 0, 0)]
Review and study of general physiological principles and bioengineering perspectives of the human circulatory, respiratory, digestive, immune, nervous, muscular and excretory systems.
**Term Offered:** Fall

BIOE 5260 Medical Imaging Systems I
[3 credit hours (3, 0, 0)]
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:** EECS 3200
**Term Offered:** Spring

BIOE 5300 Analysis Of Bioengineering Systems
[3 credit hours (3, 0, 0)]
Application of modern computing methods to the numerical and statistical analysis of bioengineering systems.
**Term Offered:** Spring

BIOE 5620 Cellular Electrophysiology
[3 credit hours (3, 0, 0)]
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 electrodifussion applied to ionic flow through open channels.
**Term Offered:** Spring

BIOE 5640 Applications of Biotransport
[3 credit hours (3, 0, 0)]
The application of engineering principles to the design and analysis of artificial organs and their clinical application.
**Term Offered:** Spring

BIOE 5650 Bioseparations
[3 credit hours (3, 0, 0)]
Practical and theoretical aspects of processes required to separate and purify cells, proteins and other biological compounds. This course will focus on new and nontraditional methods.
**Prerequisites:** BIOE 3500
**Term Offered:** Spring, Fall

BIOE 5710 Biomechanics of Soft and Hard Materials
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Introduction to and utilization of computational packages for bioengineering applications. Introduction to finite element analysis and applications in biomechanics, biofluidics, bioheat transfer, optimization.
**Term Offered:** Spring
**BIOE 5740 Tissue Engineering**  
[3 credit hours (3, 0, 0)]  
Application of principles from engineering and the life sciences toward the development of biological substitutes that restore, maintain, or improve tissue function.  
**Term Offered:** Spring, Fall

**BIOE 5750 Experimental Methods In Orthopedic Biomechanics**  
[3 credit hours (2, 3, 0)]  
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 or CIVE 1160  
**Term Offered:** Spring

**BIOE 5780 Advanced Biomechanics**  
[3 credit hours (3, 0, 0)]  
Three-dimensional 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 arthroplasty: bone plates, hip fracture fixation devices, and external fixators.  
**Term Offered:** Fall

**BIOE 5930 Bioengineering Seminar**  
[0 credit hours (0, 0, 0)]  
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 (0-3, 0, 0)]  
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 (0, 0, 0)]  
The student, under the guidance of their research adviser, explores in-depth specific areas or topics related to their thesis or dissertation research.  
**Corequisites:** BIOE 5110  
**Term Offered:** Spring, Summer, Fall

**BIOE 6100 Computational Physiology**  
[3 credit hours (3, 0, 0)]  
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 and BIOE 4100  
**Term Offered:** Spring

**BIOE 6210 Optical Instrumentation For Bioengineering**  
[3 credit hours (3, 0, 0)]  
Introduction to the theory and design of topical instruments for bioengineers. Instruments using geometrical, physical and quantum optical principles will be discussed.  
**Term Offered:** Spring

**BIOE 6310 Cell and Tissue Engineering Laboratory**  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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 and BIOE 5780  
**Term Offered:** Spring

**BIOE 6730 Biological Transport Phenomena**  
[3 credit hours (3, 0, 0)]  
Application of transport phenomena and reaction engineering in the understanding of signaling, growth processes and the flow of biological fluids in mammalian vessels in living systems.

**BIOE 6920 Bioengineering Project**  
[1-6 credit hours (0, 0, 0-3)]  
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**  
[1-12 credit hours (0, 0, 0-3)]  
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 7260 Medical Imaging Systems I**  
[3 credit hours (3, 0, 0)]  
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:** EECS 3200  
**Term Offered:** Spring

**BIOE 7930 Bioengineering Seminar**  
[0 credit hours (0, 0, 0)]  
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 (0-3, 0, 0)]  
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 (0, 0, 0)]  
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
**M.S. in Bioengineering**

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:

- Register and attend the weekly bioengineering department seminar. Registration and attendance are mandatory every semester.
- Complete 12 hours of bioengineering core course work:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOE 5200</td>
<td>Physiology And Anatomy For Bioengineers</td>
<td>3</td>
</tr>
<tr>
<td>or BIOE 6100</td>
<td>Computational Physiology</td>
<td></td>
</tr>
<tr>
<td>BIOE 5260</td>
<td>Medical Imaging Systems I</td>
<td>3</td>
</tr>
<tr>
<td>BIOE 6520</td>
<td>Orthopaedic Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>BIOE 6310</td>
<td>Cell and Tissue Engineering Laboratory</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td><strong>12</strong></td>
</tr>
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</table>

- Complete six hours of elective course work as approved by the adviser to support the research area.
- Complete MIME 6000 to satisfy the mathematics requirement.
- Complete nine hours of bioengineering M.S. thesis research (thesis option), 6 hours of M.S. project research and 3 hours of additional graduate course work (project option), or 9 additional hours of graduate course work (course work option).

**Ph.D. in Bioengineering**

The doctor of philosophy degree in engineering is conferred on the basis of extended study and high scholarly attainment in the field of bioengineering. The entrance requirement for the Ph.D. program in bioengineering is the M.S. in bioengineering or another engineering field that meets the requirements of the bioengineering department. The M.D., D.D.S. and D.V.M. are acceptable, provided the student presents 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. Direct admission students will not write and defend an M.S. thesis or receive an M.S. degree en route to the Ph.D. degree.

**Admission to Candidacy**

To be admitted to doctoral candidacy, all doctoral students must meet the following requirements:

- Pass the bioengineering qualifying examination.
- Select a faculty adviser and dissertation committee.
- Pass the bioengineering dissertation research proposal examination.
- Earn at least a 3.0/4.0 GPA for all graduate level course work.

The doctor of philosophy degree in engineering requires a minimum of 90 semester hours of approved graduate course work beyond the B.S. degree or 60 semester hours beyond the M.S. degree. For students directly admitted into the Ph.D. program with a B.S. degree, the M.S. course work and the Ph.D. course work requirements must be satisfied. All course work must be approved by the student's adviser. Each student must meet the following minimum general course work requirements beyond the M.S. degree requirements:
especially the development of packaging materials with enhanced barrier properties for product preservation. This work is conducted largely through the University's Polymer Institute. Finally, membrane materials and processes are being developed for desalination, waste water treatment, carbon dioxide capture, and energy production.

**Degrees Offered**

- M.S. in Chemical Engineering (p. 97)
- Ph.D. in Engineering (p. 98)

**CHEE 5410 New Separations**

[3 credit hours (0, 0, 3)]

Introduction to and analysis of new separation techniques relevant to downstream processing of bioreactor products. Topics include new extraction and adsorption methods, chromatography techniques, ultrafiltration and electrokinetic methods such as electrophoresis and isoelectric focusing.

**Term Offered:** Spring, Fall

**CHEE 5800 Polymer Science And Engineering**

[3 credit hours (0, 0, 3)]

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**

[1 credit hour (0, 0, 1)]

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 (3, 0, 0)]

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 (3, 0, 0)]

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

**Term Offered:** Spring

**CHEE 6120 Biofuels**

[3 credit hours (3, 0, 0)]

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 (0, 0, 3)]
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.
Term Offered: Spring

CHEE 6510 Advanced Chemical Engineering Thermodynamics
[3 credit hours (0, 0, 3)]
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: Fall

CHEE 6550 Transport Phenomena I
[3 credit hours (3, 0, 0)]
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: Fall

CHEE 6560 Transport Phenomena II
[3 credit hours (0, 0, 3)]
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.
Prerequisites: CHEE 6550
Term Offered: Spring

CHEE 6860 Polymer Laboratory Methods
[3 credit hours (0, 0, 3)]
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 (1-6, 0, 0)]
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
[1-15 credit hours (0, 0, 0-6)]
Graduate research towards the completion of a Master’s Degree.
Term Offered: Spring, Summer, Fall

CHEE 6970 Graduate Industrial Internship
[1-6 credit hours (0, 0, 1-6)]
Academic advisor approved industrial or non-profit internship to provide an experiential learning component to the Masters degree program.
Term Offered: Spring, Summer

CHEE 6980 Special Topics In Chemical Engineering
[1-6 credit hours (0, 0, 0-3)]
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 7930 Seminar in Chemical Engineering
[1 credit hour (0, 0, 1)]

CHEE 8010 Green Engineering Principles
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring

CHEE 8120 Biofuels
[3 credit hours (3, 0, 0)]
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 8510 Advanced Chemical Reaction Engineering
[3 credit hours (0, 0, 3)]
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.
Term Offered: Spring

CHEE 8550 Transport Phenomena I
[3 credit hours (0, 0, 3)]
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.
Term Offered: Spring

CHEE 8580 Advanced Chemical Engineering Thermodynamics
[3 credit hours (0, 0, 3)]
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: Fall

CHEE 8590 Transport Phenomena I
[3 credit hours (0, 0, 3)]
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: Fall
**CHEE 8560 Transport Phenomena II**

[3 credit hours (0, 0, 3)]

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.

**Prerequisites:** CHEE 8550

**Term Offered:** Spring

**CHEE 8860 Polymer Laboratory Methods**

[3 credit hours (0, 0, 3)]

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**

[1-15 credit hours (0, 0, 0-6)]

Graduate research towards the completion of a Doctoral Degree.

**Term Offered:** Spring, Summer, Fall

**CHEE 8980 Special Topics In Chemical Engineering**

[1-6 credit hours (0, 0, 0-3)]

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

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**M.S. in Chemical Engineering**

**Admission of Chemistry Majors**

A special program is in place for students who are Chemistry Majors, and it requires them to take required pre-requisite 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.

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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEE 6500</td>
<td>Advanced Chemical Reaction Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6510</td>
<td>Advanced Chemical Engineering Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6550</td>
<td>Transport Phenomena I</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6560</td>
<td>Transport Phenomena II</td>
<td>3</td>
</tr>
<tr>
<td>Graduate course work (excluding Graduate Seminar)</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

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.

**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:

<table>
<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
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</thead>
<tbody>
<tr>
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<td>3</td>
</tr>
<tr>
<td>CHEE 6510</td>
<td>Advanced Chemical Engineering Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6550</td>
<td>Transport Phenomena I</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6560</td>
<td>Transport Phenomena II</td>
<td>3</td>
</tr>
<tr>
<td>Graduate course work</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

**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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEE 6500</td>
<td>Advanced Chemical Reaction Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6510</td>
<td>Advanced Chemical Engineering Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6550</td>
<td>Transport Phenomena I</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6560</td>
<td>Transport Phenomena II</td>
<td>3</td>
</tr>
<tr>
<td>Graduate course work</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

**CHEE 6920**

Chemical Engineering Project (completed to the satisfaction of the faculty project supervisor)

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 three (3) hours of Graduate Seminar (CHEE 5930), independent study, special problems, or special topics; six (6) hours if the student opts for the course work option will count towards the degree requirements
- 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, 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 & Environmental Engineering, CHEE 5930, each semester during the academic year. This course usually 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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 6200</td>
<td>Green Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 6210</td>
<td>Environmental Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6010</td>
<td>Green Engineering Principles</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6110</td>
<td>Green Engineering Applications</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6600</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>EFSB 6690</td>
<td>Technology Commercialization</td>
<td>3</td>
</tr>
<tr>
<td>or EFSB 6590</td>
<td>New Venture Creation</td>
<td></td>
</tr>
</tbody>
</table>

Elective graduate course work 12

Total Hours 30

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 Industrial 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.

**Polymer Option**

Students may choose to pursue the Polymer Option for their M.S.Ch.E. to complete the Polymer Option, students must obtain a “B” grade or higher in four (4) of the polymer option classes listed in the Graduate Courses section. Note that some classes are offered alternating years only. Students should contact the Director of the Polymer Institute for more details regarding class content and schedule.

**Ph.D. in Engineering**

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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEE 8500</td>
<td>Advanced Chemical Reaction Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 8510</td>
<td>Advanced Chemical Engineering Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 8550</td>
<td>Transport Phenomena I</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 8560</td>
<td>Transport Phenomena II</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional graduate course work, including: 33

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEE 5930</td>
<td>Seminars In Chemical Engineering</td>
<td>1</td>
</tr>
</tbody>
</table>

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 usually 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 fifteen (15) 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 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

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 three (3) 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 completion of the spring term for all new doctoral students and covers three areas:

1. transport phenomena,
2. thermodynamics, and
3. reaction engineering.

The exam tests material normally covered at the undergraduate level as well as material from the first year graduate classes. The questions are open-ended and student responses are discussed in-depth. The faculty will evaluate students' oral communication skills and their ability to analyze problems qualitatively in addition to whether an appropriate answer is given.

Students either pass or fail the exam. The faculty as a whole will evaluate the results as well as input from the student's advisor 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. However, a second chance at passing the exam is not guaranteed.

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 committee still fails the student, the student may petition the Graduate Committee of the College of Engineering to review the Advisory Committee decision.

Polymer Option

Students may choose to pursue the Polymer Option for their Ph.D. To complete the Polymer Option, students must obtain a "B" grade or higher in all six (6) of the polymer option classes listed in the Graduate Courses section. Note that some classes are offered alternating years only. Students should contact the Director of the Polymer for more details regarding class content and schedule.

Department of Civil and Environmental Engineering

Ashok Kumar, chair and graduate program director

The department of civil and environmental engineering offers graduate degree programs and conducts research in two focus areas – environmental and infrastructure engineering. Environmental engineering includes advanced study in areas such as:

- outdoor and indoor air quality;
- sustainable buildings;
- water infrastructure sustainability;
- contaminated sediments;
- microbial degradation of organic compounds;
• microbial sensors;
• computer modeling of contaminant release and dispersion in soils and in air;
• environmental decision making;
• air quality models for industries;
• risk assessment; and
• wastewater treatment processes.

Infrastructure engineering includes:

• structural and earthquake engineering,
• transportation engineering and
• geotechnical engineering.
  • Geotechnical engineering includes advanced study in areas such as:
    • shallow and deep foundations,
    • groundwater and seepage, and
    • experimental and theoretical soil mechanics.
  • Structural engineering includes advanced study in areas such as:
    • earthquake engineering;
    • structural repair and rehabilitation;
    • structural health monitoring;
    • numerical and experimental analysis; and
    • design.
  • Transportation engineering includes advanced study in areas such as:
    • traffic and facility design;
    • urban transportation planning;
    • pavement materials’ properties and design;
    • pavement management;
    • intelligent transportation systems; and
    • transportation system management and economics.

**Degrees Offered**

• M.S. in Civil Engineering (p. 103)
• Ph.D. in Civil Engineering (p. 103)

**CIVE 5210 Advanced Soil Mechanics**
[3 credit hours (3, 0, 0)]
A study of soil behavior including stress distributions, deformation, consolidation and shear strength. The course focuses upon the development and use of well accepted solutions and practical applications.

**CIVE 5240 Design With Geosynthetics**
[3 credit hours (3, 0, 0)]
Use of geosynthetic materials in engineering design for reinforcement, barrier, separation and/or drainage functions. Design applications for geotechnical, transportation and environmental uses.

**CIVE 5300 Advanced Mechanics Of Materials**
[3 credit hours (3, 0, 0)]
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:** Fall

**CIVE 5320 Computer-Aided Analysis of Structures**
[3 credit hours (3, 0, 0)]
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

**CIVE 5340 Experimental Mechanics**
[3 credit hours (0, 2, 2)]

**Term Offered:** Spring

**CIVE 5430 Structural Steel Design II**
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]

**CIVE 5450 Bridge Design I**
[3 credit hours (3, 0, 0)]
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 5480 Reinforced Masonry Design**
[3 credit hours (3, 0, 0)]
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 5550 Traffic Control**
[3 credit hours (0, 2, 2)]
To provide a detailed understanding of the basic concepts of traffic engineering together with driver-roadway-vehicle system characteristics. Capacity analysis of freeways, rural highways, multilane and two lane highways. Traffic control devices and traffic signal design and capacity. Traffic studies and data collections; volume, speed and travel time, accident and parking studies. Introduction to other tools to mitigate traffic congestion.

**Term Offered:** Fall
CIVE 5610 Water Resources And Hydrology
[3 credit hours (3, 0, 0)]
Term Offered: Spring

CIVE 5630 Indoor Air Quality
[3 credit hours (3, 0, 0)]
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 5650 Industrial Ventilation
[3 credit hours (3, 0, 0)]
Industrial ventilation as related to need of industrial hygiene engineer, including principles of air flow, natural and power ventilation, supply and exhaust, characteristics and design of systems, fans, collectors, testing instruments. Construction guidelines for local exhaust systems.
CIVE 5670 Solid Waste Management And Disposal
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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: Fall

CIVE 5690 Sustainability Engineering
[3 credit hours (3, 0, 0)]
Course develops students’ abilities to apply the principles of sustainability to engineered systems. 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 (3, 0, 0)]
A systematic approach to the analysis of complicated engineering system involving uncertain and probabilistic phenomena. Decision-making with multiple objectives, monte carlo simulation, reliability based design, and Markov process are studied.
Term Offered: Fall

CIVE 5930 Graduate Seminar In Civil Engineering
[1-3 credit hours (0-3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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: Fall

CIVE 6340 Mechanics Of Stability
[3 credit hours (3, 0, 0)]
Differential equations. Buckling of centrally and eccentrically loaded compression members; variational methods of determining critical loads; lateral and torsional buckling of beams; introduction to dynamic stability; parametric excitations; nonconservative stability problems; buckling of plates.

CIVE 6360 Dynamics Of Structures
[3 credit hours (3, 0, 0)]
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: Fall

CIVE 6360 Advanced Composite Materials In Infrastructure
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Structural behavior and failure modes of prestressed concrete structures; design in prestressed concrete, including long-span structures, bridges and precast systems.
Prerequisites: CIVE 5440
Term Offered: Spring, Fall
CIVE 6490 Nonlinear Modeling of Reinforced Concrete
[3 credit hours (3, 0, 0)]
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 and CIVE 6310 or CIVE 8310 or MIME 4280 or MIME 5280

CIVE 6630 Dispersion And Risk Modeling
[3 credit hours (3, 0, 0)]
Treatment of atmospheric dispersion problems, development of air quality models, components of a physical model, selection and evaluation of air pollution software, evaluation of models, risk modeling, EPA models and recent topics.

CIVE 6670 Physicochemical Processes for Water Quality Control
[3 credit hours (3, 0, 0)]
The course will discuss theories and designs for water treatment processes.
Term Offered: Fall

CIVE 6690 Dispersion Modeling Laboratory
[1 credit hour (0, 2, 0)]
Use of USEPA network, use of ten computer programs from the USEPA network, use of Internet and environmental BBS, search for environmental data bases using search engines.
Prerequisites: CIVE 6630

CIVE 6900 Civil Engineering Problems
[3 credit hours (3, 0, 0)]
Special assignment of civil engineering problems of various types at the graduate level.
Term Offered: Spring, Summer, Fall

CIVE 6960 Graduate Research And Thesis - Masters
[1-9 credit hours (0, 0, 0-9)]
MS student should register their adviser’s section number.
Term Offered: Spring, Summer, Fall

CIVE 6980 Graduate Research And Project - Masters
[1-6 credit hours (0, 0, 0-6)]
MS student should register their adviser’s section number.
Term Offered: Spring, Summer, Fall

CIVE 6990 Special Topics - Independent Study
[1-3 credit hours (0, 0, 1-3)]
An opportunity for a qualified graduate student to pursue a relevant area of Civil and Environmental Engineering under the supervision of a faculty member. Course may be repeated.
Term Offered: Spring, Summer, Fall

CIVE 7340 Experimental Mechanics
[3 credit hours (0, 2, 2)]

CIVE 7430 Structural Steel Design II
[3 credit hours (3, 0, 0)]

CIVE 7450 Bridge Design I
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-6)]

CIVE 8280 Environmental and Energy Geotechnology
[3 credit hours (3, 0, 0)]
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 modeling 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 (3, 0, 0)]
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: Fall

CIVE 8340 Mechanics Of Stability
[3 credit hours (3, 0, 0)]
Differential equations. Buckling of centrally and eccentrically loaded compression members; variational methods of determining critical loads; lateral and torsional buckling of beams; introduction to dynamic stability; parametric excitations; nonconservative stability problems; buckling of plates.

CIVE 8360 Dynamics Of Structures
[3 credit hours (3, 0, 0)]
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: Fall

CIVE 8460 Advanced Composite Materials In Infrastructure
[3 credit hours (3, 0, 0)]
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 8480 Prestressed Concrete Structures
[3 credit hours (3, 0, 0)]
Structural behavior and failure modes of prestressed concrete structures; design in prestressed concrete, including long-span structures, bridges and precast systems.
Prerequisites: CIVE 7440
Term Offered: Spring, Fall
CIVE 8490 Nonlinear Modeling of Reinforced Concrete
[3 credit hours (3, 0, 0)]
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 and CIVE 6310 or CIVE 8310 or MIME 4280 or MIME 5280
CIVE 8630 Dispersion And Risk Modeling
[3 credit hours (3, 0, 0)]
Treatment of atmospheric dispersion problems, development of air quality models, components of a physical model, selection and evaluation of air pollution software, evaluation of models, risk modeling, EPA models and recent topics.
CIVE 8670 Physicochemical Processes for Water Quality Control
[3 credit hours (3, 0, 0)]
The course will discuss theories and designs for water treatment processes.
Term Offered: Fall
CIVE 8690 Dispersion Modeling Laboratory
[1 credit hour (0, 2, 0)]
Use of USEPA network, use of ten computer programs from the USEPA network, use of Internet and environmental BBS, search for environmental data bases using search engines.
Prerequisites: CIVE 8630
Term Offered: Spring, Summer, Fall
CIVE 8900 Independent Problems
[1-6 credit hours (0-6, 0, 0)]
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 (0, 0, 0-16)]
Graduate research towards the completion of a Doctoral degree.
Term Offered: Spring, Summer, Fall
CIVE 8990 Special Topics - Independent Study
[1-3 credit hours (0, 0, 1-3)]
An opportunity for a qualified graduate student to pursue a relevant area of Civil and Environmental Engineering under the supervision of a faculty member.
Term Offered: Spring, Summer, Fall

M.S. in Civil Engineering

For the master of science in civil engineering (M.S.C.E.) degree, a minimum of 30 credit hours is required – 21 hours of graduate course work (a minimum of nine credit hours should be at the 6000 level or above) and nine hours of thesis research (CIVE 6960) performed under the supervision of a full-time faculty member of 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 credit hours is required – 24 hours of graduate course work (a minimum of 12 credit hours should be 6000 level or above) and six hours for the project report. In a course work option, a minimum of 30 credit hours in graduate course work is required, of which a minimum of 9 credit hours should be at the 6000 level or above. Courses taken on an audit basis do not count toward the degree. Additional requirements include:

- A maximum of six hours of independent study are 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 nine credit hours 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.

Ph.D. in Civil Engineering

To be formally admitted to candidacy for the doctoral degree, students must first pass the qualifying examination. The purpose of the qualifying exam is to determine whether a student possesses the necessary potential to complete doctoral degree requirements. The exam consists of two parts – a written examination and an oral proposal defense. The written exam is given in the middle of the fall or spring semester. It is intended to test the breadth and depth of the student’s understanding of fundamentals and the most important and basic elements of the broad area of graduate studies in which the student is specializing.

The oral defense of the proposed dissertation research is held before an advisory committee of at least five faculty members. Prior to the defense, students submit a written proposal to the committee. The defense consists of a brief presentation of the written proposal followed by a question and answer session. During the exam, the committee will assess the appropriateness of the proposed research for a doctoral dissertation and the student’s ability to successfully complete it. Students must defend their proposal in the fall or spring semester following passage of the written exam. Upon passing both parts of the qualifying exam, students may apply for admission to candidacy.

After completion of a minimum of 45 credit hours of course work beyond the bachelor’s degree and 45 credit hours of dissertation research, doctoral candidates must prepare a written dissertation documenting their research results. Final approval for graduation is contingent upon a successful oral defense of the dissertation before the advisory committee in a public forum.

Students applying for admission are expected to have completed a B.S. in civil engineering. Those with degrees in other areas of engineering or science will have 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.

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

Mansoor Alam, chair
Daniel Georgiev, graduate program director

The Department of Electrical Engineering and Computer Science (EECS) offers advanced studies leading to the M.S. and the Ph.D. degrees as well as a Graduate Certificate in Cybersecurity. Graduate courses and research include topics in computer systems design and applications (hardware and software); communications; control and signal processing; intelligent systems; machine vision and imaging; power systems; power electronics; nano-electronic materials and devices; photovoltaic devices; laser-based advanced processing; renewable energy and smart grid; microelectronics; VLSI design automation and testing; fault tolerance and reliability; computer networks; robotics; computer graphics and visualization; automotive systems; electromagnetics; computer aided design and simulation; cyber security; hardware oriented security and trust; social networking; and high performance computing.

EECS department faculty members participate in five academic and research focus areas. Research activities of faculty often exceed a certain focus area, resulting in faculty participating in more than one focus area. Each focus area has a required and a recommended list of courses for all graduate students pursuing that area of specialization. The courses needed to complete the degree requirements are selected by the student in consultation with an advisor. The five focus areas:

- **High Performance Computing Systems (HPCS)**
  Research in the HPCS focus group includes the following topics:
  - High Performance Scalable Software, Information Systems and Services;
  - Virtual Systems,
  - Computer Networking;
  - Cyber Security;
  - Hardware Oriented Security and Trust;
  - Wireless and Sensor Networks;
  - System software and parallel computing,
  - Numerical Computing and applications,
  - Hypermedia & Multimedia Environments,
  - Reliable Computing,
  - Field Programmable Gate Arrays, and

- **Software and Intelligent Systems (SIS)**
  Intelligent systems embody inquiries into artificial and computational intelligence fields. Research in the SIS focus group includes the following topics:
  - Artificial Intelligence,
  - Machine Learning,
  - Artificial Neural Networks,
  - Data-Mining,
  - Fuzzy Logic and Reasoning,
  - Hybrid Algorithms, and
  - Social Networking.

- **Communications, Control and Signal Processing (CCSP)**
  Research in the CSP focus group includes the following topics:
  - Data Compression and Image Processing;
  - Satellite Communication;
  - Sensor Array Processing;
  - Development of Hardware for Real Time Applications;
  - Computation for Digital Receiver; and
  - Passive Radar Systems.

- **Power Electronics and Energy Systems (PEES)**
  Electrical Engineering basically consists of two primary functions: processing information and processing energy. The research in this focus group is primarily concerned with processing energy in electrical form, but to accomplish this it is necessary to also utilize many techniques from the information sector. Therefore the research in this area depends on fields such as:
  - Power Electronics,
  - Electro-Mechanical Machines,
  - Energy Storage Devices,
  - Control Systems,
  - Computer Analysis Methods and Modeling,
  - Real Time Embedded Systems, and
  - Smart Grids and Meters.

- **Solid-State and RF Devices and Systems (SRDS)**

Degrees Offered

- M.S. in Electrical Engineering (p. 110)
- M.S. in Engineering (p. 111)
- Ph.D. in Engineering (p. 111)

EECS 5120 Introduction to Fuzzy Systems and Applications
[3 credit hours (3, 0, 0)]
Term Offered: Fall

EECS 5130 Digital Design
[4 credit hours (0, 2.5, 3)]
The design of digital systems, design methodologies, hardware description language such as VHDL, behavioral-, dataflow- and structural-level description of digital systems. Implementation technologies including PLDs and FPGAs.
Term Offered: Spring

EECS 5170 Real-Time Embedded Systems Design
[3 credit hours (0, 2.5, 2)]
Programming applications in a real-time environment. Applications programs in a multitasking environment. Examples from process control, robotics, signal analysis and multiwindow software.

EECS 5200 Feedback Control Systems
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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: Fall

EECS 5360 Communication Systems
[3 credit hours (3, 0, 0)]
Fourier transform applications in signal analysis and communication. Signals spectra, Filtering, AM and FM modulations, Noise and optimum receiver, Sampling theorem, Multiplexing, PCM Introduction to digital modulators and demodulators.
Term Offered: Spring, Fall

EECS 5370 Information Theory And Coding
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Discrete Fourier Transform (DFT), Discrete convolution and correlation, Fast Fourier Transform (FFT) and its applications. Design of IIR and FIR digital filters, Multi-rate/channel digital systems, Decimation and Interpolation.
Term Offered: Spring

EECS 5390 Wireless And Mobile Networks
[3 credit hours (3, 0, 0)]
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 5400 Solid State Electronics
[3 credit hours (3, 0, 0)]
A comprehensive treatment of the theory and operation of physical electronic devices emphasizing electrical transport in metals and semiconductors and various models of BJT's and FET's.
Term Offered: Fall
EECS 5410 Electro-Optics
[3 credit hours (3, 0, 0)]
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: Fall

EECS 5460 Power Systems Analysis
[3 credit hours (3, 0, 0)]
Fault analysis, Transient Stability Analysis, Transmission System modeling, Distribution Networks.
Term Offered: Spring

EECS 5470 Electronic Design
[3 credit hours (0, 2.5, 2)]
Principles and techniques of analog active circuit design. Selected design problems are given; working circuits using standard parts are designed and laboratory tested. A design notebook is kept.
Term Offered: Spring

EECS 5480 Electronic Energy Processing I
[3 credit hours (3, 0, 0)]
Term Offered: Fall

EECS 5490 Electronic Energy Processing II
[3 credit hours (0, 2.5, 2)]
Resonant dc-dc converters. DC-AC inverters and harmonic analysis. Variable-speed motor drives. Laboratory design and analysis of various electronic energy processing circuits.
Prerequisites: EECS 5480
Term Offered: Spring

EECS 5500 Programming for the World Wide Web
[3 credit hours (3, 0, 0)]
Fundamental concepts and programming languages for constructing contemporary 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
[4 credit hours (4, 0, 0)]
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.
Term Offered: Spring

EECS 5530 Computer Graphics I
[4 credit hours (0, 2.5, 3)]
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.
Term Offered: Fall

EECS 5540 Computer Graphics II
[4 credit hours (0, 2.5, 3)]
Examines current topics related to realistic and representative 3D computer graphics. Topics include curve and surface geometry, solid modeling, raytracing, radiosity and real-time computer graphics.

EECS 5560 Database Systems I
[3 credit hours (3, 0, 0)]
The following topics are covered: relational database modeling, query languages, design issues and implementation issues of databases. An appropriate database language is introduced and used to demonstrate principles.
Term Offered: Fall

EECS 5570 Human Computer Interface Design
[3 credit hours (3, 0, 0)]
This course presents the fundamental theory and practice of design, implementation and evaluation of human-computer interfaces.
Term Offered: Spring

EECS 5600 Solid State Devices
[3 credit hours (3, 1, 0)]
Theory and operation of physical electronic devices. Electrical transport in metals, semiconductors and models of BJTs and FETs. Optoelectronic devices and integrated circuits. Laboratory includes hands-on experimentation with basic semiconductor fabrication processes.
Term Offered: Fall

EECS 5610 Digital VLSI Design I: Basic Subsystems
[4 credit hours (0, 2.5, 3)]
CMOS process technologies. CMOS logic families. Custom and semicustom design. Subsystem design; adders, counters, multipliers. System design methods. VLSI design tools.
Prerequisites: EECS 3400

EECS 5680 Artificial Intelligence
[3 credit hours (3, 0, 0)]
This course explores the topic of intelligent software agents with an 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 multi-agent environments.
Term Offered: Spring

EECS 5690 Computer Security
[3 credit hours (3, 0, 0)]
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 and EECS 3540
Term Offered: Fall
EECS 5920 Projects
[1-6 credit hours (0, 0, 0)]  
Independent research project with intensive investigation into an area of practical interest to the student and the instructor.  
**Term Offered:** Spring, Summer, Fall

EECS 5930 Electrical Engineering & Computer Science Seminar
[1 credit hour (1, 0, 0)]  
All graduate students are expected to attend the seminars and to prepare a report summarizing their experiences, questions and the impact of the seminar series. Students will also present their thesis and dissertation results.  
**Term Offered:** Spring, Fall

EECS 5980 Special Topics in EECS
[1-4 credit hours (1-4, 0, 0)]  
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 (3, 0, 0)]  
Architectural development in computer systems and scalability. Processors and arithmetic algorithms. Memory hierarchy, shared memory and cache architecture. Pipeline, superscaler and vector organization.  
**Term Offered:** Fall

EECS 6180 Biologically Inspired Computing  
[3 credit hours (3, 0, 0)]  
**Term Offered:** Spring

EECS 6190 Renewable Energy and Smart Grid  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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

EECS 6250 Advanced Digital Signal Processing  
[3 credit hours (3, 0, 0)]  
Documentation/interpolation filter design, wavelet transforms, spectral estimation, multivariate, adaptive, radar and array signal processing techniques, beamforming, simulation of signal processing algorithms via MATLAB or equivalent.  
**Term Offered:** Spring

EECS 6300 Random Signals And Optimal Filters  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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, multimedia compression standards, JPEG, MPEG coding.  
**Term Offered:** Spring

EECS 6340 Modern Communications Engineering I  
[3 credit hours (3, 0, 0)]  
Introduction to detection and estimation and applications to the bandpass signals, Binary and M-ary digital modulation techniques, Error-control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques.  
**Term Offered:** Fall

EECS 6350 Modern Communications Engineering II  
[3 credit hours (3, 0, 0)]  
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.  
**Prerequisites:** EECS 6340

EECS 6390 Modeling And Performance Evaluation Of Communication Networks  
[3 credit hours (3, 0, 0)]  
**Term Offered:** Spring, Fall

EECS 6410 Advanced Electromagnetic Components  
[3 credit hours (3, 0, 0)]  
Maxwell’s equations, transmission line theory, technology CAD, circuit modeling of magnetics, antenna design, electromagnetic interference (EMI), signal integrity.  
**Term Offered:** Fall

EECS 6420 Computer-Aided Modeling and Design of Circuits  
[3 credit hours (3, 0, 0)]  
Introduction to computer aided design, classification of CAD operations, modified nodal admittance matrix, frequency-domain analysis, time-domain analysis of nonlinear circuits, sensitivity analysis, high-frequency modeling and design.  
**Term Offered:** Fall
EECS 6450 Advanced Power Electronics
[3 credit hours (3, 0, 0)]
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.
Prerequisites: EECS 5480

EECS 6550 Software Specification And Design
[3 credit hours (3, 0, 0)]
This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.
Term Offered: Fall

EECS 6570 Intelligent Systems
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Term Offered: Spring

EECS 6630 Digital and VLSI System Testing
[3 credit hours (3, 0, 0)]
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 6660 Field Programmable Gate Arrays
[3 credit hours (3, 0, 0)]
Term Offered: Fall

EECS 6830 Power Semiconductor Device Engineering
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 6900 Independent Research
[1-6 credit hours (0, 0, 0)]
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 (0, 0, 1)]
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 (0, 0, 0)]
Graduate research towards the completion of a Master's degree.
Term Offered: Spring, Summer, Fall

EECS 6980 Special Topics In Electrical Engineering & Computer Science
[1-5 credit hours (0, 0, 0)]
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 (0, 0, 0)]
In depth study of a selected topic of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

EECS 7520 Advanced Systems Programming
[4 credit hours (4, 0, 0)]
EECS 8110 Advanced Computer Architecture
[3 credit hours (3, 0, 0)]
Architectural development in computer systems and scalability. Processors and arithmetic algorithms. Memory hierarchy, shared memory and cache architecture. Pipeline, superscaler and vector organization.
Term Offered: Fall

EECS 8180 Biologically Inspired Computing
[3 credit hours (3, 0, 0)]
Introduction to Computational Techniques inspired from Biology. Evolutionary Computation, Evolutionary Fuzzy Systems and Evolutionary Neural Systems, Swarm Intelligence, and Artificial Life.
Term Offered: Spring

EECS 8190 Renewable Energy and Smart Grid
[3 credit hours (3, 0, 0)]
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 these changes.
Term Offered: Fall

EECS 8220 Nonlinear Control Systems
[3 credit hours (3, 0, 0)]

EECS 8230 Optimal Control Theory
[3 credit hours (3, 0, 0)]
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

EECS 8250 Advanced Digital Signal Processing
[3 credit hours (3, 0, 0)]
Documentation/interpolation filter design, wavelet transforms, spectral estimation, multirate, adaptive, radar and array signal processing techniques, beamforming, simulation of signal processing algorithms via MATLAB or equivalent.
Term Offered: Spring

EECS 8300 Random Signals And Optimal Filters
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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, multimedia compression standards, JPEG, MPEG coding.
Term Offered: Spring

EECS 8340 Modern Communications Engineering I
[3 credit hours (3, 0, 0)]
Introduction to detection and estimation and applications to thebandpass signals, Binary and M-ary digital modulation techniques, Error-control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques.
Term Offered: Fall

EECS 8350 Modern Communications Engineering II
[3 credit hours (3, 0, 0)]
Digital transmission over Gaussian/non-Gaussian channels, Satellite systems (GEO and LEO) and multiple accesses, Cellular and satellite communication network, Mobile/wireless Personal communication services (PCS) and its networking.
Prerequisites: EECS 6340
Term Offered: Spring, Fall

EECS 8390 Modeling And Performance Evaluation Of Communication Networks
[3 credit hours (3, 0, 0)]
Term Offered: Spring, Fall

EECS 8410 Advanced Electromagnetic Components
[3 credit hours (3, 0, 0)]
Maxwell's equations, transmission line theory, technology CAD, circuit modeling of magnetics, antenna design, electromagnetic interference (EMI), signal integrity.
Term Offered: Fall

EECS 8420 Computer-Aided Modeling and Design of Circuits
[3 credit hours (3, 0, 0)]
Introduction to computer aided design, classification of CAD operations, modified nodal admittance matrix, frequency-domain analysis, time-domain analysis of nonlinear circuits, sensitivity analysis, high-frequency modeling and design.
Term Offered: Fall

EECS 8450 Advanced Power Electronics
[3 credit hours (3, 0, 0)]
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

EECS 8550 Software Specification And Design
[3 credit hours (3, 0, 0)]
This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.
Term Offered: Fall

EECS 8570 Intelligent Systems
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]  
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 (3, 0, 0)]  
Term Offered: Spring

EECS 8610 Principles of CMOS Devices  
[3 credit hours (3, 0, 0)]  
Term Offered: Spring

EECS 8630 Digital and VLSI System Testing  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
Introduction to FPGA’s. Programming technology. Logic block architectures. Routing architectures. FPGA based VLSI design. Design tools.  
Term Offered: Fall

EECS 8830 Power Semiconductor Device Engineering  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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

EECS 8860 RF Integrated Circuits  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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 (0, 0, 0-6)]  
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 (0, 0, 1)]  
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  
[1-15 credit hours (0, 0, 0-15)]  
Graduate research towards completion of a doctoral degree.  
Term Offered: Spring, Summer, Fall

EECS 8980 Current Topics In Electrical Engineering & Computer Science  
[1-5 credit hours (0, 0, 0)]  
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 (0, 0, 0-3)]  
In depth study of a selected topic of mutual interest to the student and the instructor.  
Term Offered: Spring, Summer, Fall

M.S. in Electrical Engineering

Two M.S. degrees are offered by the department – one in Electrical Engineering and the other in Engineering. Students studying under the HPCS or SIS focus groups receive the M.S. in Engineering, with concentration in Computer Science and Engineering, while those working under the other groups receive the M.S. in Electrical Engineering degree. The Master of Science degree is offered with the following options.

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

Students must complete the following additional requirements:
• Submit a Plan of Study, which must be approved by a faculty advisor and the graduate program director.
• A minimum of 18 hours of EECS courses (including thesis/project and independent study).
• At least six hours of EECS courses at the 6000 level, excluding thesis and independent study.
• 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.

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.

M.S. in Engineering

Two M.S. degrees are offered by the department – one in Electrical Engineering and the other in Engineering. Students studying under the HPCS or SIS focus groups receive the M.S. in Engineering, with concentration in Computer Science and Engineering, while those working under the other groups receive the M.S. in Electrical Engineering degree. The Master of Science degree is offered with the following options.

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

Students must complete the following additional requirements:

• Submit a Plan of Study, which must be approved by a faculty advisor and the graduate program director.
• A minimum of 18 hours of EECS courses (including thesis/project and independent study).
• At least six hours of EECS courses at the 6000 level, excluding thesis and independent study.

• 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.

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.

Ph.D. in Engineering

Doctoral studies in the EECS department leads to the degree of Doctor of Philosophy (Ph.D.) in Engineering. The Ph.D. degree is offered in two concentrations:

• Ph.D. in Engineering with concentration in Electrical Engineering (EE) and
• Ph.D. in Engineering with concentration in Computer Science and Engineering (CSE).

Students majoring in EE may choose from the following focus groups:

• Communications, Control, and Signal Processing (CCSP),
• Power Electronics and Energy Systems (PEES), or
• Solid State and RF Devices and Systems (SRDS).

Students majoring in Computer Science and Engineering may select either:

• High Performance Computing Systems (HPCS) or
• Software and Intelligent Systems (SIS) focus group.

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. usually 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 15 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 should be given to the graduate director. Also, every student is required to attend the seminar class in EECS and maintain at least an 80 percent attendance-rate.

**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 five areas: three based on the core courses of the focus group; and two areas based on the recommended list in the student’s focus group chosen in consultation with the student’s advisor. These courses are enumerated solely for the purpose of defining the scope and coverage of the exam. The examination will be given in two written parts. Further details pertaining to the qualifying exam 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 contain both breadth of knowledge and depth of specialization in one of the focus areas outlined earlier. The program 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.

**Department of Mechanical, Industrial, and Manufacturing Engineering**

Abdollah A. Afjeh, chair
Efstratios Nikolaidis, graduate programs 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 and
- Doctor of Philosophy in Engineering.

The fields of Mechanical Engineering are very diverse offering opportunities in research, design, product development and manufacturing. Major areas of Mechanical Engineering include aerodynamics, fluid dynamics, solid mechanics, bio-engineering, 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.

**Research Focus Areas**

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

- **Computational and Experimental Thermal Sciences:** The computational and experimental thermal 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. D.R. Hixon (coordinator), L. Berhan, A. Fatemi, M. S. Hefzy, G. Naganathan, E. Nikolaidis, M. Pourazady, R. Rizvi, B. Trease, H. Zhang.

- **Solid Mechanics and Design:** The objectives of the solid mechanics and design 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 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 the dynamic behavior and control of mechanisms, machines, mechanical systems, processes, structures and smart material systems, including MEMS, biomechanics, design methodology, fatigue and fracture mechanics, machine dynamics, noise and vibration analysis and control, solid modeling and vehicle dynamics. M. Elahinia (coordinator), L. Berhan, A. Fatemi, M. S. Hefzy, G. Naganathan, E. Nikolaidis, M. Pourazady, R. Rizvi, B. Trease, H. Zhang.

- **Materials, Manufacturing and Systems:** The materials, manufacturing and systems focus group emphasizes solving manufacturing problems. Example problems include the development of processes for products, basic understanding of metal forming and cutting, and improvement of the environmental impact of industry. An essential aspect of this group is the blend of practical plant expertise with the benefits of computational technologies, including computer-aided design and manufacturing. Processes are understood from a “hands-on” perspective and expanded through defining theoretical models. Engineering materials are studied throughout their life cycle, from raw material acquisition, product creation and usage, remanufacturing, recycling and final material disposal. Key expertise within this group includes internationally recognized faculty in rapid prototyping, process engineering, grinding and abrasives engineering, facilities planning and modeling, and environmentally conscious manufacturing. S. Bhaduri (coordinator), M. Franchetti, A.H. Jayatissa, I. Marinescu, R. Rizvi, H. Sojoudi, H. Zhang.

**Degrees Offered**

- M.S. in Industrial Engineering (p. 118)
- M.S. in Mechanical Engineering (p. 118)
- Ph.D. in Engineering (p. 119)
EECS 5120 Introduction to Fuzzy Systems and Applications
[3 credit hours (3, 0, 0)]
Term Offered: Fall

EECS 5130 Digital Design
[4 credit hours (0, 2.5, 3)]
The design of digital systems, design methodologies, hardware description language such as VHDL, behavioral-, dataflow- and structural-level description of digital systems. Implementation technologies including PLDs and FPGAs.
Term Offered: Spring

EECS 5170 Real-Time Embedded Systems Design
[3 credit hours (0, 2.5, 0)]
Programming applications in a real-time environment. Applications programs in a multitasking environment. Examples from process control, robotics, signal analysis and multiwindow software.

EECS 5200 Feedback Control Systems
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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: Fall

EECS 5360 Communication Systems
[3 credit hours (3, 0, 0)]
Fourier transform applications in signal analysis and communication. Signals spectra, Filtering, AM and FM modulations, Noise and optimum receiver, Sampling theorem, Multiplexing, PCM Introduction to digital modulators and demodulators.
Term Offered: Spring, Fall

EECS 5370 Information Theory And Coding
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Discrete Fourier Transform (DFT), Discrete convolution and correlation, Fast Fourier Transform (FFT) and its applications. Design of IIR and FIR digital filters, Multi-rate/channel digital systems, Decimation and Interpolation.
Term Offered: Spring

EECS 5390 Wireless And Mobile Networks
[3 credit hours (3, 0, 0)]
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 5400 Solid State Electronics
[3 credit hours (3, 0, 0)]
A comprehensive treatment of the theory and operation of physical electronic devices emphasizing electrical transport in metals and semiconductors and various models of BJT's and FET's.
Term Offered: Fall

EECS 5410 Electro-Optics
[3 credit hours (3, 0, 0)]
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: Fall

EECS 5460 Power Systems Analysis
[3 credit hours (3, 0, 0)]
Fault analysis, Transient Stability Analysis, Transmission System modeling, Distribution Networks.
Term Offered: Spring

EECS 5470 Electronic Design
[3 credit hours (0, 2.5, 2)]
Principles and techniques of analog active circuit design. Selected design problems are given; working circuits using standard parts are designed and laboratory tested. A design notebook is kept.
Term Offered: Spring
EECS 5480 Electronic Energy Processing I
[3 credit hours (3, 0, 0)]
Term Offered: Fall

EECS 5490 Electronic Energy Processing II
[3 credit hours (0, 2.5, 2)]
Resonant dc-dc converters. DC-AC inverters and harmonic analysis. Variable-speed motor drives. Laboratory design and analysis of various electronic energy processing circuits.
Prerequisites: EECS 5480
Term Offered: Spring

EECS 5500 Programming for the World Wide Web
[3 credit hours (3, 0, 0)]
Fundamental concepts and programming languages for constructing contemporary 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
[4 credit hours (4, 0, 0)]
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.
Term Offered: Spring

EECS 5530 Computer Graphics I
[4 credit hours (0, 2.5, 3)]
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.
Term Offered: Fall

EECS 5540 Computer Graphics II
[4 credit hours (0, 2.5, 3)]
Examines current topics related to realistic and representative 3D computer graphics. Topics include curve and surface geometry, solid modeling, raytracing, radiosity and real-time computer graphics.

EECS 5560 Database Systems I
[3 credit hours (3, 0, 0)]
The following topics are covered: relational database modeling, query languages, design issues and implementation issues of databases. An appropriate database language is introduced and used to demonstrate principles.
Term Offered: Fall

EECS 5590 Human Computer Interface Design
[3 credit hours (3, 0, 0)]
This course presents the fundamental theory and practice of design, implementation and evaluation of human-computer interfaces.
Term Offered: Spring

EECS 5600 Solid State Devices
[3 credit hours (3, 1, 0)]
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
[4 credit hours (0, 2.5, 3)]
CMOS process technologies. CMOS logic families. Custom and semicustom design. Subsystem design; adders, counters, multipliers. System design methods. VLSI design tools.
Prerequisites: EECS 3400

EECS 5640 Experimental and Theoretical Solid State Device Physics
[3 credit hours (3, 0, 0)]
This course examines pertinent concepts of solid state devices with a focus on advanced topics related to fabrication, characterization, and applications of solid state devices. Practical experience in a lab setting is included.
Term Offered: Spring

EECS 5690 Electronic Energy Processing III
[3 credit hours (3, 0, 0)]
Topics include electrical energy processing circuits, power electronics, and microelectronic systems. This course is designed for students interested in the design and analysis of power electronics systems.
Prerequisites: EECS 5480

EECS 5740 Artificial Intelligence
[3 credit hours (3, 0, 0)]
This course explores the topic of intelligent software agents with a focus on hands-on design of adaptive problem-solving agents for environments of increasing complexity ranging from single-agent computer games to complex real-world multi-agent environments.
Term Offered: Spring

EECS 5750 Machine Learning
[3 credit hours (3, 0, 0)]
This course emphasizes learning algorithms and theory including concept, decision tree, neural network, comptrational, Bayesian, evolutionary, and reinforcement learning.
Prerequisites: (MIME 4000 and MATH 2890 and EECS 2110)
Term Offered: Fall

EECS 5760 Computer Security
[3 credit hours (3, 0, 0)]
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 and EECS 3540
Term Offered: Fall

EECS 5920 Projects
[1-6 credit hours (0, 0, 0)]
Independent research project with intensive investigation into an area of practical interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

EECS 5930 Electrical Engineering & Computer Science Seminar
[1 credit hour (1, 0, 0)]
All graduate students are expected to attend the seminars and to prepare a report summarizing their experiences, questions and the impact of the seminar series. Students will also present their thesis and dissertation results.
Term Offered: Spring, Fall

EECS 5980 Special Topics in EECS
[1-4 credit hours (1-4, 0, 0)]
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 (3, 0, 0)]
Architectural development in computer systems and scalability. Processors and arithmetic algorithms. Memory hierarchy, shared memory and cache architecture. Pipeline, superscalar and vector organization.
Term Offered: Fall

EECS 6180 Biologically Inspired Computing
[3 credit hours (3, 0, 0)]
Term Offered: Spring

EECS 6190 Renewable Energy and Smart Grid
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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

EECS 6250 Advanced Digital Signal Processing
[3 credit hours (3, 0, 0)]
Documentation/interpolation filter design, wavelet transforms, spectral estimation, multirate, adaptive, radar and array signal processing techniques, beamforming, simulation of signal processing algorithms via MATLAB or equivalent.
Term Offered: Fall

EECS 6300 Random Signals And Optimal Filters
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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, multimedia compression standards, JPEG, MPEG coding.
Term Offered: Spring

EECS 6340 Modern Communications Engineering I
[3 credit hours (3, 0, 0)]
Introduction to detection and estimation and applications to the bandpass signals, Binary and M-ary digital modulation techniques, Error-control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques.
Term Offered: Fall

EECS 6350 Modern Communications Engineering II
[3 credit hours (3, 0, 0)]
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.
Prerequisites: EECS 6340
Term Offered: Spring

EECS 6390 Modeling And Performance Evaluation Of Communication Networks
[3 credit hours (3, 0, 0)]
Term Offered: Spring, Fall

EECS 6410 Advanced Electromagnetic Components
[3 credit hours (3, 0, 0)]
Maxwell’s equations, transmission line theory, technology CAD, circuit modeling of magnetics, antenna design, electromagnetic interference (EMI), signal integrity.
Term Offered: Fall

EECS 6420 Computer-Aided Modeling and Design of Circuits
[3 credit hours (3, 0, 0)]
Introduction to computer aided design, classification of CAD operations, modified nodal admittance matrix, frequency-domain analysis, time-domain analysis of nonlinear circuits, sensitivity analysis, high-frequency modeling and design.
Term Offered: Fall

EECS 6450 Advanced Power Electronics
[3 credit hours (3, 0, 0)]
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

EECS 6550 Software Specification And Design
[3 credit hours (3, 0, 0)]
This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.
Term Offered: Fall

EECS 6570 Intelligent Systems
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Term Offered: Spring

EECS 6630 Digital and VLSI System Testing  
[3 credit hours (3, 0, 0)]
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 6660 Field Programmable Gate Arrays  
[3 credit hours (3, 0, 0)]
Introduction to FPGA’s. Programming technology. Logic block architectures. Routing architectures. FPGA based VLSI design. Design tools.
Term Offered: Fall

EECS 6830 Power Semiconductor Device Engineering  
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 1)]
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 (0, 0, 0)]
Graduate research towards the completion of a Master’s degree.
Term Offered: Spring, Summer, Fall

EECS 6980 Special Topics In Electrical Engineering & Computer Science  
[1-5 credit hours (0, 0, 0)]
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 (0, 0, 0)]
In depth study of a selected topic of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

EECS 7520 Advanced Systems Programming  
[4 credit hours (4, 0, 0)]

EECS 8110 Advanced Computer Architecture  
[3 credit hours (3, 0, 0)]
Architectural development in computer systems and scability. Processors and arithmetic algorithms. Memory hierarchy, shared memory and cache architecture. Pipeline, superscaler and vector organization.
Term Offered: Fall

EECS 8180 Biologically Inspired Computing  
[3 credit hours (3, 0, 0)]
Introduction to Computational Techniques inspired from Biology. Evolutionary Computations, Evolutionary Fuzzy Systems and Evolutionary Neural Systems, Swarm Intelligence, and Artificial life.
Term Offered: Spring

EECS 8190 Renewable Energy and Smart Grid  
[3 credit hours (3, 0, 0)]
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 8220 Nonlinear Control Systems  
[3 credit hours (3, 0, 0)]

EECS 8230 Optimal Control Theory  
[3 credit hours (3, 0, 0)]
Optimization of dynamic systems by the calculus of variations and Pontrjagin’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
EECS 8250 Advanced Digital Signal Processing
[3 credit hours (3, 0, 0)]
Documentation/interpolation filter design, wavelet transforms, spectral estimation, multirate, adaptive, radar and array signal processing techniques, beamforming, simulation of signal processing algorithms via MATLAB or equivalent.
Term Offered: Spring

EECS 8300 Random Signals And Optimal Filters
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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, multimedia compression standards, JPEG, MPEG coding.
Term Offered: Spring

EECS 8340 Modern Communications Engineering I
[3 credit hours (3, 0, 0)]
Introduction to detection and estimation and applications to the bandpass signals, Binary and M-ary digital modulation techniques, Error control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques.
Term Offered: Fall

EECS 8350 Modern Communications Engineering II
[3 credit hours (3, 0, 0)]
Digital transmission over Gaussian/non-Gaussian channels, Satellite systems (GEO and LEO) and multiple accesses, Cellular and satellite communication networks, Mobile/wireless Personal communication services (PCS) and its networking.
Prerequisites: EECS 6340
Term Offered: Spring

EECS 8390 Modeling And Performance Evaluation Of Communication Networks
[3 credit hours (3, 0, 0)]
Term Offered: Spring, Fall

EECS 8410 Advanced Electromagnetic Components
[3 credit hours (3, 0, 0)]
Maxwell's equations, transmission line theory, technology CAD, circuit modeling of magnetics, antenna design, electromagnetic interference (EMI), signal integrity.
Term Offered: Fall

EECS 8420 Computer-Aided Modeling and Design of Circuits
[3 credit hours (3, 0, 0)]
Introduction to computer aided design, classification of CAD operations, modified nodal admittance matrix, frequency-domain analysis, time-domain analysis of nonlinear circuits, sensitivity analysis, high-frequency modeling and design.
Term Offered: Fall

EECS 8450 Advanced Power Electronics
[3 credit hours (3, 0, 0)]
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

EECS 8550 Software Specification And Design
[3 credit hours (3, 0, 0)]
This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.
Term Offered: Fall

EECS 8570 Intelligent Systems
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Term Offered: Spring

EECS 8630 Digital and VLSI System Testing
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Term Offered: Fall
EECS 8830 Power Semiconductor Device Engineering
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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

EECS 8860 RF Integrated Circuits
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0-6)]
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 (0, 0, 0)]
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
[1-15 credit hours (0, 0, 0-15)]
Graduate research towards completion of a doctoral degree.
Term Offered: Spring, Summer, Fall

EECS 8980 Current Topics In Electrical Engineering & Computer Science
[1-5 credit hours (0, 0, 0)]
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 (0, 0, 0-3)]
In depth study of a selected topic of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

M.S. in Industrial Engineering

Applicants must hold a bachelor of science 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. The Master of Science degree program may be pursued with thesis, project and non-thesis options.

1. Master of Science degree with thesis option: The plan of study must include 30 hours of graduate work, including 9 credit hours of Master of Science thesis successfully completed under the supervision of an M.I.M.E. faculty member. Courses must be selected from those approved for graduate study (5000 level or above). A minimum of 12 hours of course work must be in the student’s focus area of study.

2. Master of Science degree with non-thesis options:
   a. Master of Science degree with project option: Students are required to complete 30 credit hours at the graduate level, including six hours of Master of Science project under the supervision of a M.I.M.E. faculty member. The project option must be approved by the M.I.M.E. departmental chair or the graduate program director. Students are required to submit a professional, written project report to the department after due approval by the faculty adviser. The project report will then be logged and archived in the department as a technical report.
   b. Master of Science degree with course work-only option: Students are required to complete a minimum of 30 credit hours of graduate level course work as specified by the department.

The majority of a student’s course work for all of the options will normally be from M.I.M.E. courses. Three or more hours of the course work must be from approved courses in advanced mathematics. A minimum of 12 credits must be 6000-level courses. 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 adviser or department.

Also, all supported students are required to enroll and/or participate in a graduate seminar (MIME 6930 or equivalent) each semester. 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 hours of academic course work has been completed. For full-time students, this normally will require that the plan of study be filed before registration for the second term.

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

M.S. in Mechanical Engineering
Applicants must hold a bachelor of science 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. The Master of Science degree program may be pursued with thesis, project and non-thesis options.

1. **Master of Science degree with thesis option:** The plan of study must include 30 hours of graduate work, including 9 credit hours of Master of Science thesis successfully completed under the supervision of an M.I.M.E. faculty member. Courses must be selected from those approved for graduate study (5000 level or above). A minimum of 12 hours of course work must be in the student’s focus area of study.

2. **Master of Science degree with non-thesis options:**
   a. **Master of Science degree with project option:** Students are required to complete 30 credit hours at the graduate level, including six hours of Master of Science project under the supervision of a M.I.M.E. faculty member. The project option must be approved by the M.I.M.E. departmental chair or the graduate program director. Students are required to submit a professional, written project report to the department after due approval by the faculty adviser. The project report will then be logged and archived in the department as a technical report.
   b. **Master of Science degree with course work-only option:** Students are required to complete a minimum of 30 credit hours of graduate level course work as specified by the department.

The majority of a student’s course work for all of the options will normally be from M.I.M.E. courses. Three or more hours of the course work must be from approved courses in advanced mathematics. A minimum of 12 credits must be 6000-level courses. 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 adviser or department.

Also, all supported students are required to enroll and/or participate in a graduate seminar (MIME 6930 or equivalent) each semester. 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 hours of academic course work has been completed. For full-time students, this normally will require that the plan of study be filed before registration for the second term.

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

**Ph.D. in Engineering**

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 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 Degree Candidacy**

Doctoral candidacy requires satisfactory performance in the doctoral qualifying examination, filing of an approved doctoral program plan, selection of an academic adviser, formation of a doctoral dissertation committee and maintaining good academic performance as specified in the M.I.M.E. 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 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. The signatures of the committee on the candidate’s dissertation indicate approval of the dissertation research and represent the final certification of its adequacy.

**Graduate Degrees/Certificates Offered**

- Doctor of Philosophy in Biomedical Engineering (p. 119)
- Master of Science in Engineering - Energy Engineering (p. 121)
- Practice-Oriented Master of Science in Engineering (p. 123)
- J.D./M.S. Dual Degree Program (p. 124)

**Doctor of Philosophy in Biomedical Engineering**

Mohamed Samir Hefzy, Program Co-Director from the College of Engineering
Dorothea Sawicki, Program Co-Director from the College of Medicine

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. The program is open to qualified students with either 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 PhD students to commercialize the biomedical technology they may develop as part of their dissertation research. The curriculum also provides a PhD program for MD students from undergraduate engineering backgrounds that are interested in pursuing a dual degree and careers as physician scientists.

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

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

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 PhD curriculum requirements are designed to allow students maximum flexibility in selecting coursework appropriate for the research area. The curriculum for the PhD in Biomedical Engineering centers on several core course requirements in mathematics, engineering, and the life sciences. Additional technical courses are taken as needed to support the research area. In addition to the technical content, students take two courses from the College of Business on intellectual property and research commercialization, and develop a business plan to commercialize their dissertation research. Individual course selections are made by the student and the student’s research advisor and/or dissertation committee.

The core courses include the following:

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BMSP 8330</td>
<td>Curr Prob Res App Protein Str</td>
<td>3</td>
</tr>
<tr>
<td>BMSP 8340</td>
<td>Curr Prob Res App Genes/Genome</td>
<td>3</td>
</tr>
<tr>
<td>BMSP 8350</td>
<td>Cell Biology &amp; Signaling</td>
<td>3</td>
</tr>
<tr>
<td>BMSP 8360</td>
<td>Curr Prob Cell Membranes</td>
<td>3</td>
</tr>
<tr>
<td>MPHY 8040</td>
<td>Diag Radiological Physics (or equivalent)</td>
<td>3</td>
</tr>
</tbody>
</table>

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

The PhD 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 as part of the approved elective coursework. Students may also elect to complete the additional graduate level COBI course EFSB 6690.

**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-Directors 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 biohazardous 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 submits 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.

Master of Science in Engineering - Energy Engineering
Matthew Franchetti, 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. 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.

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, the Master of Science in engineering program with a concentration in energy engineering at the University of Toledo has three options for specialization:

1. Power generation and distribution (option 1), or
2. Energy utilization and management (option 2), or
3. Advanced energy systems (option 3).

All students are expected to complete the following requirements:

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>MIME 5980</td>
<td>Special Topics (Energy sources, applications and economics)</td>
<td>3</td>
</tr>
<tr>
<td>Select at least one of the following law/business/management courses:</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>LAWM 5000</td>
<td>Law And The Legal System</td>
<td></td>
</tr>
<tr>
<td>BLAW 6100</td>
<td>Business, Government And Society</td>
<td></td>
</tr>
<tr>
<td>MGMT 6100</td>
<td>Leading Through Ethical Decision-Making</td>
<td></td>
</tr>
<tr>
<td>Select at least one of the following engineering courses:</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MIME 5820</td>
<td>Sustainability Analysis and Design</td>
<td></td>
</tr>
<tr>
<td>Select the following engineering course if in option 1 (specialization option A):</td>
<td>0-3</td>
<td></td>
</tr>
<tr>
<td>EECS 5240</td>
<td>Power Systems Operation (or equivalent)</td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>9-12</td>
</tr>
</tbody>
</table>

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 accomplished 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 accounted for in the student’s employer utilizing skills learned in this program. Students should consult their advisor regarding this option.

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 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.

**Admission 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 take into account the applicant’s previous academic record, the intended area of study, and the capacity of the College of Engineering.

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 deemed 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 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 scores for the test of English as a Foreign Language (TOEFL). The minimum acceptable score for the TOEFL is 213 (for computer-based test) or 80 (for internet-based test).

Students entering the program will be required to have at least:

- calculus, through ordinary differential equations (3 semesters),
- physics (2 semesters) and
- chemistry and/or engineering materials (1 semester) and
- any three out of the following six courses:
  - 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.

Students can apply for special student status and take up to nine credit hours of graduate classes, which may be applied to their graduate degree program. Students with special status 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 EnergyEngineering@eng.utoledo.edu.
Practice-Oriented Master of Science in Engineering

Matthew Franchetti, Program Director

The College of Engineering at the University of Toledo offers a practice oriented Master of Science degree in engineering with a concentration in General Engineering. This engineering master's degree program is intended for students who are full-time employees seeking the master's degree to facilitate career advancement or achievement of personal educational goals. It is designed for current and future managers of technology. 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 online via distance learning.

Degree Requirements

The practice-oriented Master of Science in engineering program requires 30 credit hours at graduate level. The project option requires the completion of a minimum of 24 credit hours of approved graduate course work and 6 hours of work-related project. The coursework option requires the completion of at least 30 credit hours of approved graduate course work. The student is expected to meet the following general requirements:

- Six hours of engineering core courses to establish a common foundation in engineering. These courses include:

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>GNEN 6700</td>
<td>Management of Projects and Technological Innovation</td>
<td>6</td>
</tr>
<tr>
<td>GNEN 5700</td>
<td>Applied Probability and Statistics</td>
<td>6</td>
</tr>
<tr>
<td>GNEN 5500</td>
<td>Applications of Engineering Analysis</td>
<td>6</td>
</tr>
</tbody>
</table>

- Twelve to eighteen hours of engineering elective courses to support the student's focus area. Each elective course is worth three credit hours, so a minimum of four courses are required. Graduate offerings in the bioengineering, chemical engineering, civil and environmental engineering, electrical engineering and computer science, general engineering, or mechanical, industrial and manufacturing engineering departments are eligible for selection as electives.

- For the project option, six credit hours 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 in two semesters plus the summer. Students may complete their course requirements in four semesters by taking the recommended two courses per semester.

For transfer credit, students should refer to the general policies of the College of Graduate Studies. No more than nine credit hours 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.

Admission Requirements

To be admitted to the Practice-Orientated Masters of Science in 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). Applicants must be employed or have experience in private industry, government or nonprofit organizations. Admissions are made on an individual basis and take into account the applicant's previous record, the intended area of study, and the needs and capacity of the College of Engineering.

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 deemed 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 or other basis, at the option of the college. Students with an undergraduate GPA below 2.7 must register and take the GRE. 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 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 will be required to have at least:

- Calculus, through Ordinary Differential Equations (3 semesters),
- Physics (2 semesters) and
- 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.

Students can apply for non-degree student status and take up to nine credit hours of graduate classes, which may be applied to their graduate degree program. Students with non-degree status can be admitted as regular graduate students at a later date.

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

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 through a program of integrated curriculum 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.

**Admission**

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, only courses completed after admission to the dual-degree program can be counted toward the degree requirements in the discipline.

**Advising**

The College of Law and the College of Engineering, with the College of Graduate Studies, will administer and advise with regard to 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 graduate studies. A dual program oversight committee will review policies and monitor the progress of students toward the dual degree completion.

**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.

**Description of the Curriculum**

The integrated program and curriculum leads 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. 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. The credit of up to 12 credit hours from the College of Law would be determined in consultation with the associate dean of graduate studies of The University of Toledo 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. The credit of up to 12 hours of course work from the College of Engineering would be determined in consultation with the associate dean of The University of Toledo College of Law.
The UT 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 collaboration, 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 UT 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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College Policies (Graduate Handbook)
COGS Graduate Student Handbook (http://www.utoledo.edu/graduate/files/Graduate%20Student%20Handbook%202015-2016.pdf)
- College Policies and Procedures (p. 392)
- Academic Regulations (p. 394)
- Other Policies and Information (p. 399)


Schools
- School of Exercise and Rehabilitation Sciences (p. 125)
- School of Intervention and Wellness (p. 146)
- School of Population Health (p. 163)
- School of Social Justice (p. 181)

School of Exercise and Rehabilitation Sciences
RUTHIE KUCHAREWSKI, chair

The school of exercise and rehabilitation sciences offers graduate programs leading to the master of science in exercise science (M.S.E.S.) and the doctor of philosophy in exercise science (Ph.D.) degrees. These programs involve a combination of courses, seminars, clinical experiences and research that is intended to prepare individuals for a wide range of careers that relate to exercise science. Involvement in research is emphasized throughout the program.

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

A dual doctoral degree program leading to the doctor of philosophy in exercise science is available for students admitted to the occupational therapy doctorate or the doctorate of physical therapy. Please see those programs which are located in school of exercise and rehabilitation sciences.

Degrees Offered
- Doctor in Physical Therapy/PhD in Exercise Science (p. 138)
- Doctor of Physical Therapy Program (p. 138)
- MA in Recreation and Leisure Studies (p. 140)
- MS in Exercise Science (p. 141)
- Occupational Therapy Doctorate (p. 143)
- Occupational Therapy Doctorate/PhD in Exercise Science (p. 145)
- Occupational Therapy Doctorate/PhD in Health Education (p. 145)
- PhD in Exercise Science (p. 145)
KINE 5110 Measurement And Statistical Inference In Human Performance
[3 credit hours (3, 0, 0)]
Application of measurement and statistical inference to human performance testing and research. Includes descriptive and inferential statistics, principles of test construction and introduction to authentic assessment in public schools.
Term Offered: Spring

KINE 5250 Readings In Exercise Biology
[3 credit hours (0, 0, 3)]
Faculty and student directed readings of original research in Exercise Biology. Readings will focus on how changes in physical activity influence the biology of skeletal muscle.
Term Offered: Spring, Fall

KINE 6010 Clinical Applications I
[1 credit hour (0, 0, 1)]
Clinical skill experience is provided to develop autonomous athletic trainer and provide exposure to implementing evidence based practice in clinical practice.

KINE 6020 Clinical Applications II
[1 credit hour (0, 0, 1)]
Continue to develop autonomous athletic training skills built upon in Clinical Applications I and continue to advance diagnosis, treatment and intervention skills.
Prerequisites: KINE 6010

KINE 6030 Clinical Applications III
[2 credit hours (2, 0, 0)]
Advanced integration of clinical skills with the introduction of mentoring athletic training students in a clinical setting.
Prerequisites: KINE 6020

KINE 6040 Clinical Applications IV
[2 credit hours (2, 0, 0)]
Preparation of autonomous athletic training care for the transition into an occupation in sports medicine.
Prerequisites: KINE 6030

KINE 6100 Physiology Of Exercise
[3 credit hours (3, 0, 0)]
This course is designed to provide an understanding of the mechanisms of the physiological responses to exercise. Emphasis will be placed on adaptations to exercise training and the role of exercise in health and disease.
Term Offered: Fall

KINE 6120 Evaluation and Management of Lower Extremity Injury
[4 credit hours (3, 1, 0)]
The study of the pathology, etiology and presentation of lower extremity injuries. Subjective and objective components as well as orthopedic special testing will be introduced and serve as the foundation for the formulation of a systematic evaluation method. In addition, acute management techniques include first aid as well as immobilization methods will be introduced. Laboratory concepts include selection and implementation of appropriate evaluation and acute management techniques.
Prerequisites: KINE 6140 and KINE 6150

KINE 6130 Biomechanics Of Human Motion
[3 credit hours (3, 0, 0)]
This course provides a basic overview of the principles of biomechanics as they apply to human movement. In-depth discussion and lab activities focus on the application of these principles to such topics as muscle function, locomotion, balance, mechanisms of injury and ergonomics.
Term Offered: Spring, Fall

KINE 6140 Functional Musculoskeletal Anatomy
[3 credit hours (1, 2, 0)]
A cadaver anatomy course focusing on foundation concepts of structural kinesiology and anatomy. In addition, the structure of various musculoskeletal tissues and functional joint complexes will be examined.

KINE 6200 Biomechanical Instrumentation
[3 credit hours (3, 0, 0)]
Provides students with experience in the research and clinical use of videography, force and pressure plates, electromyography and other systems in applied biomechanics. Emphasis on hands-on lab experience and topics related to data collection and signal processing.
Prerequisites: KINE 6130
Term Offered: Spring

KINE 6220 Evaluation and Management of Upper Extremity Injury
[4 credit hours (3, 1, 0)]
The study of the pathology, etiology and presentation of upper extremity injuries common in active populations. Subjective and objective components as well as orthopedic special testing will be introduced and serve as the foundation for the formulation of a systematic evaluation method. In addition, acute management techniques include first aid as well as immobilization methods will be introduced. Laboratory concepts include selection and implementation of appropriate evaluation and acute management techniques.
Prerequisites: KINE 6210 and KINE 6610

KINE 6230 Scientific Writing And Research Methods
[3 credit hours (3, 0, 0)]
Principles and issues involved in the design and conduct of research in exercise science: critical evaluation, research design, development of a research proposal, grant acquisition, and compliance with institutional and federal guidelines on the use of humans and animals.
Term Offered: Fall

KINE 6310 Therapeutic Interventions I
[3 credit hours (2, 1, 0)]
The study of the physiological, mechanical and bio-electrical principles related to the application of thermal, electrical and mechanical modalities in the treatment of musculoskeletal injury. Laboratory concepts include selection and application of appropriate modality use specific to patient values and situation.
Prerequisites: KINE 6140 and KINE 6150

KINE 6410 Clinical Biomechanics
[2 credit hours (1, 1, 0)]
The study of common kinematic and kinetic alterations that can occur following acute and chronic musculoskeletal injuries and the deleterious effects these changes can cause. In addition, students will be introduced to both laboratory and clinical techniques to assess and alter the kinematic and kinetic deficits associated with injury.
Prerequisites: KINE 6210 and KINE 6610
Term Offered: Spring
KINE 6420 Cardiopulmonary Exercise Physiology
[3 credit hours (3, 0, 0)]
The responses and adaptations of the cardiovascular and pulmonary systems to exercise in healthy individuals.
Prerequisites: KINE 6100
Term Offered: Spring

KINE 6430 Environmental Physiology
[3 credit hours (3, 0, 0)]
Physiological responses and adaptations to extreme environments.
Term Offered: Fall

KINE 6460 Readings in Cardiovascular Physiology
[3 credit hours (0, 0, 3)]
This is a faculty directed examination of current research in Cardiovascular Physiology. Emphasis is placed on the role of physical activity on the prevention and/or treatment of cardiovascular disease.
Term Offered: Spring, Fall

KINE 6510 Evaluation and Management of General Medical Conditions
[3 credit hours (2, 1, 0)]
The study of the pathology, etiology and presentation of common general medical conditions in active populations. Systems will include cardiovascular, respiratory, gastrointestinal, genitourinary, reproductive, dermatologic and neurologic systems and infectious diseases. For each system, subjective and objective components as well as common special tests will be introduced. In addition, concepts of pharmacology including pharmacokinetics, basic drug classifications and legal aspects of use will be covered. Specific focus will be placed on common therapeutic drugs used in sports medicine.
Prerequisites: KINE 6620

KINE 6540 Laboratory Techniques in Exercise Physiology
[3 credit hours (1, 2, 0)]
This course covers theoretical and practical knowledge for the assessment of exercise metabolism, cardiorespiratory function, body composition, thermoregulation and skeletal muscle function. Hands-on data collection will be emphasized.
Term Offered: Fall

KINE 6550 Lab Techniques in Exercise Biology
[3 credit hours (3, 0, 0)]
The course provides students with theoretical and practical knowledge for assessing cellular and molecular responses to exercise and inactivity. Emphasis will be placed on laboratory safety, reagent preparation, cell culture techniques, and tissue analysis.
Prerequisites: (KINE 6100 and KINE 6540)

KINE 6600 Issues and Management in Athletic Training
[3 credit hours (3, 0, 0)]
This course addresses current issues that affect the profession of Athletic Training. Topics cover issues that influence clinical practice as well as political issues related to the profession.
Term Offered: Spring, Fall

KINE 6610 Clinical Skills I
[2 credit hours (2, 0, 0)]
The first of sequential courses that focuses on development of professional behaviors and review of concepts and skills from previous coursework. In addition, clinical education rotations provided will allow students to implement course material into a clinical setting and gain practical hands-on experience working under the supervision of a certified athletic trainer.
Prerequisites: KINE 6150 and KINE 6140

KINE 6630 Clinical Skills III
[2 credit hours (2, 0, 0)]
The third of sequential courses that focuses on development of professional behaviors and review of concepts and skills from previous coursework. In addition, clinical education rotations provided will allow students to implement course material into a clinical setting and gain practical hands-on experience working under the supervision of a Certified Athletic Trainer.
Prerequisites: KINE 6620

KINE 6640 Clinical Skills IV
[2 credit hours (2, 0, 0)]
The final of sequential courses that focuses on development of professional behaviors and review of concepts and skills from previous coursework. In addition, clinical education rotations provided will allow students to implement course material into a clinical setting and gain practical hands-on experience working under the supervision of a Certified Athletic Trainer.
Prerequisites: KINE 6630

KINE 6660 Evidence-Based Practice in Sports Medicine
[2 credit hours (2, 0, 0)]
This course will introduce the student to clinical epidemiology and the evaluation of the efficacy of prevention, diagnosis, and treatment strategies in athletic training and sports medicine.
Term Offered: Fall

KINE 6670 Pathology of Orthopedic Injury
[3 credit hours (3, 0, 0)]
An in-depth investigation into the basic structure and mechanisms of injury of various musculoskeletal tissue applied to the recognition and prevention of specific orthopedic injuries and conditions.
Term Offered: Spring, Fall

KINE 6680 Advanced Interventions I
[2 credit hours (2, 0, 0)]
Students will be introduced to advanced techniques that impact clinical practice in Athletic Training, including manual therapy, advanced orthopedic evaluation, and advanced management and planning related to emergency medicine.
Term Offered: Spring

KINE 6690 Advanced Interventions II
[3 credit hours (2, 1, 0)]
Students will be introduced to advanced evaluation and assessment techniques that impact clinical practice, including general medical conditions, psychosocial, professionalism, and profession advocacy.
Prerequisites: KINE 6680
KINE 6720 Advanced Clinical Anatomy
[2 credit hours (0, 2, 0)]
A cadaver anatomy course focusing on the extremities. Emphasis will be placed on the link between anatomical structure, orthopedic injuries, and clinical practice.
Term Offered: Fall

KINE 6730 Optimization of Performance and Wellness
[3 credit hours (3, 0, 0)]
An investigation into the nutritional and psychological components of optimal performance and wellness in active populations as well as recognition and appropriate referral of patients with suspected substance abuse and mental health disorders. In addition, concepts related to wellness and fitness assessment and weight management in a healthy population including prescription of strengthening and conditioning exercises will be discussed.
Prerequisites: KINE 6630

KINE 6810 Scholarly Project I
[1 credit hour (0, 1, 0)]
The first of sequential courses designed to provide students hands-on engagement in clinical research and scholarship related to the athletic training field. Students will work with course Instructor and or research advisor to develop a clinical question and begin to design a research project related that question.
Prerequisites: KINE 6500 and KINE 6610

KINE 6820 Scholarly Project II
[1 credit hour (0, 1, 0)]
The second of sequential courses designed to provide students hands-on engagement in clinical research and scholarship related to the athletic training field. Students will work with course Instructor and or research advisor to carry out a research project including but not limited to recruitment of subjects, data collection and data analysis.
Prerequisites: KINE 6800 and KINE 6620

KINE 6910 Introduction to Sports Medicine Research I
[1 credit hour (1, 0, 0)]
Students will be introduced to sports medicine research with a focus on evaluating the literature, asking a clinically relevant research question, and developing experimental hypotheses.

KINE 6920 Introduction to Sports Medicine Research II
[1 credit hour (1, 0, 0)]
Students will continue to develop the ability to critique research and will be introduced to developing research methods to address a clinically question related to sports medicine.
Prerequisites: KINE 6910

KINE 6960 Masters Thesis In Exercises Science
[1-4 credit hours (0, 0, 0-3)]
Independence research in Exercise Science completed as part of the requirements for the Master of Science in Exercise Science degree.
Term Offered: Spring, Summer, Fall

KINE 6990 Independent Study In Exercise Science
[1-4 credit hours (0, 0, 0-4)]
Faculty supervised independent reading, laboratory research, field experience and other activities not suited for class instruction.
Term Offered: Spring, Summer, Fall

KINE 7110 Measurement And Statistical Inference In Human Performance
[3 credit hours (3, 0, 0)]
Application of measurement and statistical inference to human performance testing and research. Includes descriptive and inferential statistics, principles of test construction and introduction to authentic assessment in public schools.
Term Offered: Spring

KINE 7250 Readings In Exercise Biology
[3 credit hours (0, 0, 3)]
Faculty and student directed readings of original research in Exercise Biology. Readings will focus on how changes in physical activity influence the biology of skeletal muscle.
Term Offered: Spring, Fall

KINE 8100 Physiology Of Exercise
[3 credit hours (3, 0, 0)]
This course is designed to provide an understanding mechanisms of the physiological responses to exercise. Emphasis will be placed on adaptations to exercise training and the role of exercise in health and disease.
Term Offered: Fall

KINE 8130 Biomechanics Of Human Motion
[3 credit hours (3, 0, 0)]
This course provides a basic overview of the principles of biomechanics as they apply to human movement. In-depth discussion and lab activities focus on the application of these principles to such topics as muscle function, locomotion, balance, mechanisms of injury and ergonomics.
Term Offered: Spring, Fall

KINE 8200 Biomechanical Instrumentation
[3 credit hours (3, 0, 0)]
Provides students with experience in the research and clinical use of videography, force and pressure plates, electromyography and other systems in applied biomechanics. Emphasis on hands-on lab experience and topics related to data collection and signal processing.
Prerequisites: KINE 6130 or KINE 8130
Term Offered: Spring

KINE 8230 Scientific Writing And Research Methods
[3 credit hours (3, 0, 0)]
Principles and issues involved in the design and conduct of research in exercise science: critical evaluation, research design, development of a research proposal, grant acquisition, and compliance with institutional and federal guidelines on the use of humans and animals.
Term Offered: Fall

KINE 8420 Cardiopulmonary Exercise Physiology
[3 credit hours (3, 0, 0)]
The responses and adaptations of the cardiovascular and pulmonary systems to exercise in healthy individuals.
Prerequisites: KINE 8100
Term Offered: Spring

KINE 8430 Environmental Physiology
[3 credit hours (3, 0, 0)]
Physiological responses and adaptations to extreme environments.
Term Offered: Fall
KINE 8460 Readings in Cardiovascular Physiology
[3 credit hours (0, 0, 3)]
This is a faculty directed examination of current research in Cardiovascular Physiology. Emphasis is placed on the role of physical activity on the prevention and/or treatment of cardiovascular diseases.
Prerequisites: KINE 8100
Term Offered: Spring, Fall

KINE 8540 Laboratory Techniques in Exercise Physiology
[3 credit hours (1, 2, 0)]
This course covers theoretical and practical knowledge for the assessment of exercise metabolism, cardiorespiratory function, body composition, thermoregulation and skeletal muscle function. Hands-on data collection will be emphasized.
Term Offered: Fall

KINE 8550 Lab Techniques in Exercise Biology
[3 credit hours (3, 0, 0)]
The course provides students with theoretical and practical knowledge for assessing cellular and molecular responses to exercise and inactivity. Emphasis will be placed on laboratory safety, reagent preparation, cell culture techniques, and tissue analysis.
Prerequisites: (KINE 8100 and KINE 8540)

KINE 8600 Issues and Management in Athletic Training
[3 credit hours (3, 0, 0)]
This course addresses current issues that affect the profession of Athletic Training. Topics cover issues that influence clinical practice as well as political issues related to the profession.
Term Offered: Fall

KINE 8660 Evidence-Based Practice in Sports Medicine
[3 credit hours (3, 0, 0)]
An investigation into the science and theories of therapeutic rehabilitation and its impact on clinical practice using current literature and databases from the areas of evidence based medicine.
Term Offered: Fall

KINE 8670 Pathology of Orthopedic Injury
[3 credit hours (3, 0, 0)]
An in-depth investigation into the basic structure and mechanisms of injury of various musculoskeletal tissue applied to the recognition and prevention of specific orthopedic injuries and conditions.
Term Offered: Spring, Fall

KINE 8720 Anatomical Concepts for Clinical Practice
[3 credit hours (0, 0, 2)]
A cadaver anatomy course focusing on the extremities. Emphasis will be placed on the link between anatomical structure, orthopedic injuries, and clinical practice.
Term Offered: Fall

KINE 8960 Doctoral Dissertation in Exercise Science
[1-12 credit hours (0, 0, 0-12)]
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

KINE 8990 Independent Study in Exercise Science
[1-4 credit hours (0, 0, 0-4)]
Faculty supervised independent reading, laboratory research, field experience and other activities not suited for class instruction.
Term Offered: Spring, Summer, Fall

OCCT 7000 Foundations of Occupational Therapy
[3 credit hours (3, 0, 0)]
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 (5, 5, 0)]
Examines the biomechanical model of practice including its musculoskeletal and kinesiological foundations. Includes assessments and interventions for prevention, adaptation, and compensation. Includes Level I fieldwork experience (12 hours). Fall Prerequisite: Admission to OTD Program
Term Offered: Fall

OCCT 7020 OT Models of Practice II
[5 credit hours (5, 0, 0)]
Part I: Continues OCCT 701. Part II: 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. Examines a model of practice based on functions of the nervous system. Spring 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 (4, 0, 0)]
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. Includes two Level I fieldwork experiences (24 hours and 9 hours). Spring 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 (0, 0, 0)]
Examines models of practice specific to pediatric population with neurological impairments. Intervention strategies focus on neurodevelopment, neurorehabilitation, sensory integration, motor learning, and motor control impairments. Includes two Level I fieldwork experiences (12 hours and 16 hours). Summer Prerequisite: Occupational Therapy Models of Practice II
Term Offered: Summer
OCCT 7110 Research in OT I
[4 credit hours (4, 0, 0)]
Examines quantitative and qualitative research methodologies. Includes critical analysis of occupational therapy research. Explores areas of possible research interest with guidance from potential major advisors.
Fall Prerequisite: Admission to the OTD Program
Term Offered: Fall

OCCT 7210 OT Advocacy I
[2 credit hours (2, 0, 0)]
Explores the role of the occupational therapist as educator. Examines educational theory, instructional methods and technology, and evaluation of teaching effectiveness with patients, families, peers, supervisees, and community groups. Fall Prerequisite: Admission to OTD Program
Term Offered: Fall

OCCT 7220 OT Advocacy II
[2 credit hours (0, 0, 0)]
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. Summer Prerequisite: Occupational Therapy Advocacy I
Term Offered: Summer

OCCT 7310 FW and Professional Dev I
[1 credit hour (0, 0, 0)]
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. Fall Prerequisite: Admission to the OTD Program
Term Offered: Fall

OCCT 7320 FW and Professional Dev II
[1 credit hour (0, 0, 0)]
Emphasizes interviewing clients for an occupational profile. Encourages discussion of Level I fieldwork experiences. Introduces the course sequence of the Capstone Experience. Spring Prerequisite: Fieldwork and Professional Development Seminar I
Term Offered: Spring

OCCT 7330 FW and Professional Dev III
[1 credit hour (0, 0, 0)]
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 (2, 0, 0)]
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 7610 Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
Orientation to the Graduate Certificate in Teaming in Early Childhood. Focus on individual competencies needed to work collaboratively to meet the needs of young children with disabilities and their families.
Prerequisites: SPED 5270
Term Offered: Summer

OCCT 7620 Leadership and Advocacy in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This second seminar in the Graduate Certificate in Teaming in Early Childhood focuses on skills and policies that promote best practices in teaming to support young children with disabilities.
Prerequisites: SPED 5270 and OCCT 7610
Term Offered: Summer, Fall

OCCT 7630 Evidence-Based Practice and Innovation in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This third seminar in the Graduate Certificate in Teaming in Early Childhood provides students the opportunity to reflect on their practicum experiences in teaming to support young children with disabilities.
Prerequisites: OCCT 7620
Corequisites: OCCT 7640
Term Offered: Spring, Summer

OCCT 7640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
The practicum provides an opportunity to engage in interprofessional teaming in order to provide integrated services to young children with special needs in an inclusive setting.
Prerequisites: OCCT 7620
Corequisites: OCCT 7630
Term Offered: Spring, Summer

OCCT 8050 OT Models of Practice V
[5 credit hours (5, 5, 0)]
Examines occupational therapy models of practice that support occupational performance throughout the lifespan, including prevention of occupational impairment. Examines the psychosocial aspects of disease and disability. Includes Level I fieldwork experience (56 hours). Fall Prerequisite: Occupational Therapy Models of Practice IV Corequisite: Occupational Therapy Models of Practice VI
Term Offered: Fall

OCCT 8060 OT Models of Practice VI
[4 credit hours (4, 4, 0)]
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. Includes Level I fieldwork experience (2 hours). Fall Prerequisite: Occupational Therapy Models IV Corequisite: Occupational Therapy Models V
Term Offered: Fall
OCCT 8070 OT Models of Practice VII
[4 credit hours (0, 4, 0)]
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. Includes two Level I fieldwork experiences (20 hours). Spring Prerequisite: Occupational Therapy Models of Practice VI Co-requisite: Occupational Therapy Models of Practice VII
Term Offered: Spring

OCCT 8080 OT Models of Practice VIII
[3 credit hours (0, 3, 0)]
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. Includes Level I fieldwork experience at mental health sites (10 hours). Spring Prerequisite: Occupational Therapy Models of Practice VI Co-requisite: Occupational Therapy Models of Practice VII
Term Offered: Spring

OCCT 8120 Research in OT II
[3 credit hours (0, 0, 0)]
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 (0, 3, 0)]
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: Spring

OCCT 8140 Research in OT IV
[3 credit hours (0, 0, 0)]
Includes completion of data collection, analysis of results, submission of approved final project in journal article format, and formal presentation of the research project. Involves individual faculty contact. Fall, Spring, Summer Prerequisite: Research in Occupational Therapy III
Term Offered: Spring, Summer, Fall

OCCT 8230 OT Advocacy III
[2 credit hours (2, 0, 0)]
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. Fall Prerequisite: Occupational Therapy Advocacy II
Term Offered: Fall

OCCT 8240 OT Advocacy IV
[3 credit hours (3, 0, 0)]
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. Spring Prerequisite: Occupational Therapy Advocacy III
Term Offered: Spring

OCCT 8340 FW and Professional Dev IV
[1 credit hour (0, 0, 0)]
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. Encourages discussion of Level I fieldwork experiences. Fall Prerequisite: Fieldwork and Professional Development Seminar II
Term Offered: Fall

OCCT 8350 FW and Professional Dev V
[3 credit hours (0, 0, 0)]
Addresses issues of clinical supervision; Level II fieldwork policy, procedures, and documentation; and professional development. Provides a forum for discussion of fieldwork occupational analysis. Students develop a comprehensive Capstone Proposal. Includes Level I fieldwork experience (40 hours). Spring Prerequisite: Fieldwork and Professional Development Seminar IV
Term Offered: Spring

OCCT 8360 Fieldwork Level II
[3 credit hours (0, 0, 3)]
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. Summer, Fall Prerequisite: Completion of academic content except research, which may be taken concurrently
Term Offered: Spring, Summer, Fall

OCCT 8370 Fieldwork Level II
[6 credit hours (0, 0, 0)]
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. Fall Prerequisite: OCCT836 and completion of academic content except research, which may be taken concurrently
Term Offered: Spring, Summer, Fall

OCCT 8380 Capstone Practicum
[6 credit hours (0, 0, 0)]
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 OCCT890 and 891 requires documentation of 640 hours. Spring Prerequisite: Level II fieldwork, competency exam, and completion of academic content except research, which may be taken concurrently. Co-requisites: Mentored Studies in Capstone Area or approved elective and Mentored Capstone Dissemination
Term Offered: Spring, Summer
OCCT 8400 Phys Agent Mod and Non Occ Met
[2 credit hours (2, 0, 0)]
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 8800 Independent Study OT
[0-12 credit hours (0, 0, 0)]
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

OCCT 8900 Mentored Capstone Dissemination
[3 credit hours (0, 0, 0)]
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, Summer, Fall

OCCT 8910 Mentored Studies:Capstone Area
[3 credit hours (0, 0, 0)]
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 Studies in Capstone Area or approved elective and Capstone Practicum
Term Offered: Spring, Fall

PHYT 5000 Gross Anatomy
[4 credit hours (4, 0, 0)]
Students will study the structure of the human body using the structure-function relationship as the course paradigm. Musculoskeletal, vascular, and peripheral nervous systems 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 (0, 0, 0)]
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 5080 Neuroscience Seminar
[1 credit hour (0, 0, 0)]
Principles of neurophysiological and neuropathological sensory and motor function will be applied to clinical manifestations of neurological impairments commonly seen in PT settings. Procurement of basic assessment skills for clients with neuromuscular impairments will provide the clinical focus for integration of foundation neuroscience information with clinical practice.
Term Offered: Spring

PHYT 5110 Clinical Pathophysiology I
[1 credit hour (1, 0, 0)]
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: Summer

PHYT 5120 Clinical Pathophysiology II
[3 credit hours (3, 0, 0)]
Second of 2 courses that address the integrated study of normal physiological and pathophysiological processes in human body at cellular, organ, and systemic levels - emphasis on clinical manifestations and impact on PT plan of care.
Term Offered: Fall

PHYT 5170 Evidence Based Practice I
[2 credit hours (0, 0, 0)]
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: Spring
PHYT 5180 Evidence Based Practice II
[2 credit hours (0, 0, 0)]
The second of a two course series on the principles of measurement and research design, with an emphasis on the statistical analysis procedures commonly used in clinical research. The critical evaluation and analysis of research studies relevant to clinical practice will also be emphasized.
Term Offered: Summer

PHYT 5270 Applied Exercise Physiology
[3 credit hours (0, 0, 0)]
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 (0, 0, 0)]
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 (2, 0, 0)]
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 Exer
[2 credit hours (2, 0, 0)]
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 Intro to Examination
[2 credit hours (0, 0, 0)]
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: Fall

PHYT 5450 Foundations of PT
[2 credit hours (0, 0, 0)]
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 5510 Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
Orientation to the Graduate Certificate in Teaming in Early Childhood Focus on individual competencies needed to work collaboratively to meet the needs of young children with disabilities and their families.
Prerequisites: SPED 5270
Term Offered: Summer

PHYT 5520 Leadership and Advocacy in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This second seminar in the Graduate Certificate in Teaming in Early Childhood focuses on skills and policies that promote best practices in teaming to support young children with disabilities.
Prerequisites: SPED 5270 and PHYT 5510
Term Offered: Summer, Fall

PHYT 5530 Evidence-Based Practice and Innovation in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This third seminar in the Graduate Certificate in Teaming in Early Childhood provides students the opportunity to reflect on their practicum experiences in teaming to support young children with disabilities.
Prerequisites: SPED 5270 and PHYT 5610 and PHYT 5620
Corequisites: PHYT 5640
Term Offered: Spring, Summer

PHYT 5540 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
The practicum is provides an opportunity to engage in interprofessional teaming in order to provide integrated services to young children with special needs in an inclusive setting.
Prerequisites: PHYT 5620
Corequisites: PHYT 5630
Term Offered: Spring, Summer

PHYT 5560 Pharmacology of PT
[2 credit hours (0, 0, 0)]
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 (0, 0, 0)]
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: Fall
PHYT 5850 Integrated Clinical Experience I
[2 credit hours (0, 0, 0)]
The first of two full-time, integrated clinical education experiences. Students are engaged in clinical observation and supervised practice in a 4-week clinical education experience completed at the end of the first year of the DPT program. This course emphasizes the development of beginning skills in patient management, safety, clinical reasoning, and professional conduct in various clinical practice settings.
Term Offered: Spring

PHYT 5860 Clinical Practicum II
[1 credit hour (0, 0, 0)]
Clinical observation and supervised application of advancing physical therapy skills at the same clinical facility as Clinical Practicum I. An emphasis will be on continued progression in the generic abilities and a more focused approach toward the development of specific technical, cognitive or affective areas in need of improvement as identified during Clinical Practicum I.
Term Offered: Summer

PHYT 6020 Lifespan II
[2 credit hours (0, 0, 0)]
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: Spring

PHYT 6050 Hlth Care Policy and Delivery
[1 credit hour (0, 0, 0)]
Overview of the origins and components of the American health care system and major policy initiatives that influence it. Access, cost, and quality factors in health care delivery will be explored. Serves as a starting point for the student’s study of the continuously expanding sector of the American economy in which they will practice.
Term Offered: Spring, Fall

PHYT 6100 Health Promotion
[2 credit hours (2, 0, 0)]
Discussion and application of the elements of health and wellness as described by Healthy People 2010. Emphasis on health assessment, obesity, physical activity, nutrition, complementary/alternative management, and behavior modification strategies.
Term Offered: Fall

PHYT 6170 Scholarly Project I
[2 credit hours (0, 0, 0)]
The student will initiate the formal research process through refinement of a research/scholarly project proposal and, if necessary, submission of the proposal to the Institutional Review Board for human subjects for approval.
Term Offered: Fall

PHYT 6180 Scholarly Project II
[2 credit hours (0, 0, 0)]
Includes completion of data collection, analysis of the data, and initial preparation of a scholarly paper, in accordance with specific manuscript guidelines.
Term Offered: Spring

PHYT 6190 Scholarly Project III
[1 credit hour (0, 0, 0)]
Includes the final preparation of a scholarly paper which must meet the guidelines established by the College of Graduate Studies, and the oral defense/presentation of the scholarly project as required by the College of Graduate Studies.
Term Offered: Summer, Fall

PHYT 6260 Cardiovascular-Pulmonary PT
[3 credit hours (0, 0, 0)]
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 Teaching and Learning
[2 credit hours (0, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0)]
Second of two courses, continued discussion of the principles of pathophysiologic 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 (0, 0, 0)]
Theories and principles of client examination, evaluation, PT diagnosis, prognosis, and therapeutic intervention for clients with stroke and spinal cord injury. Historic and modern evidence-based treatment approaches for the neurologic patient, in general, will be discussed with emphasis on the approach’s influence in the design of a PT plan of care.
Term Offered: Fall
PHYT 6610 Neuromuscular Rehab II
[3 credit hours (0, 0, 0)]
Principles of rehabilitation for clients with chronic neuromuscular impairments and long-term disability. Emphasis on theories, philosophies, and the PT plan of care including examination, evaluation, and intervention strategies. Includes pediatric module.
Term Offered: Spring

PHYT 6700 Professional Issues
[1 credit hour (1, 0, 0)]
Prerequisite: PHYT685 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: Fall

PHYT 6720 Special Topics in PT
[2 credit hours (0, 0, 0)]
Intensive exploration of a topic related to the profession of physical therapy and designed to meet the student’s special interest and professional goals. Subject matter will vary depending upon student interest.
Term Offered: Spring, Fall

PHYT 6740 Clinical Seminar I
[1 credit hour (0, 0, 1)]
First of a series of two courses, this course emphasizes the application of clinical skills learned in didactic coursework and begins to develop problem-solving and critical thinking for a variety of diagnoses and practice settings using a variety of patient scenarios. An emphasis is placed on evidence-based decision-making, basic evaluation, intervention planning, as well as beginning evaluation of one’s own clinical reasoning processes and skills.

PHYT 6750 Clinical Seminar II
[1 credit hour (0, 0, 0)]
The second of a series of two courses, this course emphasizes the application of clinical skills and the integration of problem-solving and critical thinking for a variety of diagnoses and practice settings using a variety of patient scenarios. 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 Integrated Clinical Experience II
[5 credit hours (0, 0, 0)]
The second of two full-time, integrated clinical education experiences. Students are engaged in clinical observation and supervised practice in a 10 week clinical education experience completed at the end of the second year of the DPT program. This course emphasizes the development of intermediate skills in patient management, safety, clinical reasoning, and professional conduct in an inpatient or outpatient practice setting.
Term Offered: Summer

PHYT 6990 Independent Study in PT
[0-4 credit hours (0, 0, 0)]
In-depth exploration and study of clinically related problems or topic of interest. May be repeated for credit.
Term Offered: Spring, Summer, Fall

PHYT 7050 Practice Management
[2 credit hours (0, 0, 0)]
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: Spring, Fall

PHYT 7100 Integrated Patient Management
[4 credit hours (4, 0, 0)]
This course emphasizes an integrated and comprehensive approach to patient care for the management of complex cases with clinical ambiguity and that involve multi-system pathology or psychosocial dynamics. Patient cases will be presented to the students who are then expected to differentiate signs and symptoms of pathologies, determine patient “readiness” for PT management, develop and conduct a patient screen, design a PT plan of care, and determine a plan for discharge.
Prerequisites: PHYT 685 or PHYT 6850
Term Offered: Fall

PHYT 7200 Scholarly Project IV
[1 credit hour (0, 0, 0)]
The course includes the final preparation of a scholarly paper including the oral defense/presentation and submission of the final paper to the Department of Physical Therapy.
Prerequisites: PHYT 617 or PHYT 6170
Term Offered: Spring, Fall

PHYT 7620 Trauma Rehab
[2 credit hours (0, 0, 0)]
Integrated study of the principles of rehabilitation for clients who have sustained substantial trauma including, but not limited to: TBI, multiple fractures and burns. Students will be asked to integrate previous coursework in making decisions regarding the role of PT in the interdisciplinary management throughout the continuum of care for clients who have multi-system impairments due to physical trauma.
Prerequisites: Upper Division with a score of 1
Term Offered: Fall

PHYT 7890 Internship I
[5 credit hours (0, 0, 5)]
The first of two full-time, supervised internships completed following the culmination of the didactic portion of the DPT program. Students are engaged in supervised practice in a 10 week internship that emphasizes development toward entry-level PT competencies in all the components of professional practice and patient management in an inpatient or outpatient practice setting.
Term Offered: Fall

PHYT 7900 Internship II
[6 credit hours (0, 0, 0)]
The final full-time, supervised internship completed following the culmination of the didactic portion of the DPT program. Students are engaged in supervised practice in a 12 week internship that emphasizes development of entry-level PT competencies in all the components of professional practice and patient management in various clinical practice and specialty settings.
Term Offered: Spring
PHYT 7990 Specialty Internship
[4 credit hours (0, 0, 0)]
Extended period of supervised, advanced clinical practice and/or formal experience in administrative or professional organizational environments, which is designed to meet the student’s special interests and professional goals.
Term Offered: Spring, Fall

RCRT 5100 Community Event Planning
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the event planning process including: risk and risk management, ethics, inclusivity, planning, budgeting, organizing, location selection, travel logistics, venue and guest requirements, marketing, and food and beverage considerations.
Term Offered: Summer, Fall

RCRT 5200 Planning and Promotion of Sport
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the principles of marketing and delivery of services associated with intercollegiate athletics, professional, and multi-sport club operations, facilities and management of resources. This course also examines motivation and behavior of sports tourists.
Term Offered: Fall

RCRT 5300 Recreation And Adaptation For Special Education
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the principals of inclusion and major legislation that impacts the provision and delivery of recreational services for individuals with disabilities.
Term Offered: Spring, Fall

RCRT 5310 Leisure And Popular Culture
[3 credit hours (3, 0, 0)]
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: Fall

RCRT 5320 Administration In Recreation And Recreational Therapy
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the administrative functions of delivering recreation and therapeutic recreation services. Students will master and apply the aspects of management principles including ethics, legislation, technology, quality management, risk management, financial and human resources, marketing, and accreditation.
Term Offered: Spring

RCRT 5340 Leisure, Recreation And Aging
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the impacts of aging on leisure and recreation behavior and activity 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.
Term Offered: Spring, Fall

RCRT 5410 Facility Planning and Design
[3 credit hours (3, 0, 0)]
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 Leisure Program Research Techniques
[3 credit hours (3, 0, 0)]
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: Spring, Fall

RCRT 5610 Adventure Programming in Recreation and Recreation Therapy
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of, and ability to apply, theories and techniques of adventure programming as a treatment protocol and/or leisure education tool. Outdoor trips required.
Term Offered: Spring, Fall

RCRT 5620 Animal Assisted Therapy
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using a variety of animal-assisted modalities.
Term Offered: Spring, Fall

RCRT 5630 Therapeutic Activities
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using a variety of games, humor and play modalities.
Term Offered: Spring, Fall

RCRT 5640 Rt Intervention: Therapeutic Groups
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using therapeutic group techniques and processes as a modality.
Term Offered: Spring, Fall

RCRT 5660 Relaxation And Stress Management
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using relaxation and stress management techniques as a modality.
Prerequisites: (RCRT 1310 and RCRT 4720)
Term Offered: Spring, Fall
RCRT 5670 Rt Intervention: Leisure Education
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using leisure education activities, including: social skills, values clarification, leisure awareness, resources and knowledge. Minimum
Term Offered: Spring, Fall

RCRT 5680 Rt Intervention: Assistive Technology & Techniques
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes utilizing assistive technology techniques, and resources in therapeutic settings.
Term Offered: Spring, Fall

RCRT 5690 Rt Intervention: Aquatic Therapy
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes utilizing swimming, evidence-based aquatic programming methods, and resources.
Term Offered: Spring, Summer, Fall

RCRT 5720 Introduction To Therapeutic Recreation
[3 credit hours (3, 0, 0)]
This course is designed to introduce graduate students who do not have a background in therapeutic recreation to the 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.
Term Offered: Spring, Fall

RCRT 5730 Medical & Clinical Aspects Of Therapeutic Recreation
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of health-related conditions or disabilities related to physical, neurological, sensory and metabolic impairments across the lifespan. Uses of pharmacological interventions, family involvement, programming, and other implications impacting Therapeutic Recreation practice are examined.
Term Offered: Fall

RCRT 5750 Group Dynamics In Recreational Therapy
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
This course addresses the procedures and processes of assessment, planning, implementation and evaluation of recreation therapy services.

RCRT 5790 Medical & Clinical Aspects Of Therapeutic Recreation II
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of health-related conditions or disabilities related to intellectual and developmental disabilities and psychological impairments across the lifespan. Uses of pharmacological interventions, family involvement, programming, and other implications impacting Therapeutic Recreation practice will be examined.
Term Offered: Spring

RCRT 5800 Clinical: Physical Rehabilitation
[1 credit hour (0.5, 0.4)]
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 Clinical: Psychiatric Rehabilitation
[1 credit hour (0.5, 0.4)]
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 psychiatric rehabilitation population.
Term Offered: Spring, Fall

RCRT 5820 Clinical: Mental Retardation/Developmental Disability
[1 credit hour (0.5, 0.4)]
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 an ID/DD rehabilitation population.
Term Offered: Spring, Fall

RCRT 5830 Clinical: Geriatric
[1 credit hour (0.5, 0.4)]
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, Fall

RCRT 5860 Therapeutic Fitness
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using therapeutic fitness modalities.
Term Offered: Spring, Fall

RCRT 5870 Program Planning In Recreational Therapy
[3 credit hours (3, 0, 0)]
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 5900 Rt Intervention: Craft Therapy
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using craft therapy modalities.
Term Offered: Spring, Fall
RCRT 5910 Rt Intervention: Horticulture Therapy
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using horticulture therapy modalities.
Term Offered: Spring, Fall

RCRT 5940 Internship In Recreation And Leisure
[1-6 credit hours (0, 0, 0-18)]
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 (3, 0, 0)]
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: Summer

RCRT 6020 Financial Resources Of Recreation And Recreational Therapy
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the financial management concepts and resources supporting the delivery of recreation and recreation therapy services.
Term Offered: Summer

RCRT 6920 Master’s Project In Recreation And Leisure
[1-4 credit hours (0, 0, 0-4)]
This course provides the graduate student with the opportunity to complete a Master’s project under the supervision of a project committee in partial fulfillment for the MA degree in recreation and leisure studies.
Term Offered: Spring, Summer, Fall

RCRT 6940 Internship
[1-4 credit hours (0, 0, 0-12)]
This course provides the graduate student with the opportunity to complete an advanced internship under the supervision of a recreation professional in partial fulfillment for the MA degree in recreation and leisure studies.
Term Offered: Spring, Fall

RCRT 6960 Master’s Thesis In Recreation And Leisure
[1-4 credit hours (0, 0, 0-4)]
This course provides the graduate student with the opportunity to complete a Master’s Thesis under the supervision of a thesis committee 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 (0, 0, 0-3)]
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

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**Doctor in Physical Therapy/PhD in Exercise Science**

There is a significant demand for physical therapists who have attained the additional doctor of philosophy degree to serve as core faculty in academic positions to educate DPT students and to serve as physical therapists with clinical expertise and research experience to expand the knowledge base of the profession.

Admission to the DPT/PhD program is a two-step process. The first step is to be admitted to the DPT program. Students interested in being considered for the PhD in exercise science degree program in the school of exercise and rehabilitation sciences will then apply to that program prior to completion of the DPT program. This process will follow the established procedures for application to the school of exercise and rehabilitation sciences’ doctoral program. If selected for admission, the student will begin the PhD program after graduation from the DPT program and may apply up to 18 credits of their DPT curriculum to their PhD plan of study.

**Doctor of Physical Therapy Program**

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 94 credit hours spanning 36 months beyond the bachelor's degree. Upon successful completion of the doctor of physical therapy program, graduates are eligible to take the national licensure examination.

The deadline for applications for the DPT program at UT is October 1st prior to the year of anticipated matriculation into the program (the program begins with summer enrollment).

Seven out of the ten prerequisite courses MUST be completed at the time of application (see list below). Since the deadline to apply to UT’s DPT Program is October 1, the 7 out of 10 prerequisite courses must be completed BEFORE fall semester.

The University of Toledo participates in the Physical Therapist Centralized Application System (PTCAS). Please use their website to apply to our program (www.ptcas.org (http://www.ptcas.org)).

- Bachelor’s degree from an accredited institution
- Minimum cumulative GPA of 3.3
- Minimum prerequisite GPA of 3.0

Prerequisites include:
- One course in each of the following:
  - Human Anatomy with lab
  - Human Physiology with lab
  - 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 physical therapist and one from a professor (or employer if you are not currently a student)
• 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

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 practicums and clinical internships 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.

Each student, while enrolled in the didactic and clinical portions of the physical therapy 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 DPT Program Student Handbook. Students are prohibited to engage in laboratory activities or to attend clinical facilities if this information is not on file for the current year. For details about program requirements, see: the (http://www.utoledo.edu/healthsciences/depts/rehab_sciences/pt/pdfs/StudentHandbook%202016-17FINAL.pdf) Student Handbook located on the DPT program website.

It should also be noted that some clinical education sites have additional health requirements (flu shots, drug screens, etc.). When these are known in advance, the program will inform the student of any additional health requirements. However, during preparations for upcoming clinicals, the student is responsible for checking with the Clinical Coordinator for Clinical Education to determine if there are any additional health requirements. It is recommended that this process be initiated approximately 4-6 weeks prior to the start of the clinical to allow adequate time for completion of any additional health requirements. If the student does not complete the additional requirements of the clinical site, the student is prohibited from attending 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.

Essential Functions

The University of Toledo admits and matriculates qualified physical therapy 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. UT 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 UT physical therapy program’s ‘Essential Functions 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 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 the physical therapy program independently either with or without reasonable accommodation.

In adopting these standards, the UT 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 essential functions reflect what the physical therapy program believes are reasonable expectations for physical therapy students learning and performing patient care.

This three year full-time degree includes integrated clinical experiences and internships as well as a scholarly project.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Term</td>
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<tr>
<td>PHYT 5000</td>
<td>Gross Anatomy</td>
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<tr>
<td>PHYT 5110</td>
<td>Clinical Pathophysiology I</td>
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<tr>
<td></td>
<td>Hours</td>
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<tr>
<td>Second Term</td>
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<tr>
<td>PHYT 5050</td>
<td>Analysis of Movement</td>
<td>4</td>
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<tr>
<td>PHYT 5120</td>
<td>Clinical Pathophysiology II</td>
<td>3</td>
</tr>
<tr>
<td>PHYT 5350</td>
<td>Intro to Examination</td>
<td>2</td>
</tr>
<tr>
<td>PHYT 5450</td>
<td>Foundations of PT</td>
<td>2</td>
</tr>
<tr>
<td>PHYT 5750</td>
<td>Clinical Reasoning</td>
<td>1</td>
</tr>
<tr>
<td>PHYT 6460</td>
<td>Teaching and Learning</td>
<td>2</td>
</tr>
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<td></td>
<td>Hours</td>
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<tr>
<td>Third Term</td>
<td></td>
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<tr>
<td>PHYT 5070</td>
<td>Neuroscience</td>
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<tr>
<td>PHYT 5080</td>
<td>Neuroscience Seminar</td>
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<tr>
<td>PHYT 5170</td>
<td>Evidence Based Practice I</td>
<td>2</td>
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<tr>
<td>PHYT 5270</td>
<td>Applied Exercise Physiology</td>
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</tr>
<tr>
<td>PHYT 5280</td>
<td>Therapeutic Interventions I</td>
<td>2</td>
</tr>
</tbody>
</table>
MA in Recreation and Leisure Studies

Recreation Administration or Recreation Therapy

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.

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.

The program leading to the master's degree allows students to choose service learning projects, internships, or research activities that will prepare them for successful careers in the field. The program includes a research core, recreation core, and specific courses and electives in the student's area of concentration. A minimum of 30 credits is required for the degree with a plan of study submitted and approved during the first semester of matriculation. For further information, please contact eric.longsdorf@utoledo.edu.

Depending on student’s goals, emphasis and scheduling preference, the master’s degree with an emphasis in recreation administration can be completed online.

### Code Title Hours

#### Required Program Courses
- **RCRT 5310** Leisure And Popular Culture 1 3
- **RCRT 5320** Administration In Recreation And Recreational Therapy 1 3
- **RCRT 5420** Leisure Program Research Techniques 1 3
- **RCRT 6000** Issues And Trends In Recreation/Recreational Therapy 1 3
- **RCRT 6020** Financial Resources Of Recreation And Recreational Therapy 1 3

#### Program Concentration
Select one (1) of the following Options: A or B

**A. Recreation Administration (9 Credit Hours)**
- Select three (3) courses from the following: 9
  - **RCRT 5100** Community Event Planning 1
  - **RCRT 5200** Planning and Promotion of Sport 1
  - **RCRT 5300** Recreation And Adaptation For Special Education 1
  - **RCRT 5340** Leisure, Recreation And Aging 1
  - **RCRT 5410** Facility Planning and Design 1
  - **RCRT 5610** Adventure Programming in Recreation and Recreation Therapy
  - **RCRT 6990** Independent Study In Recreation And Leisure (Advisor Approval Required)
  - 5000/6000 Level University Elective (Advisor Approval Required)

**B. Recreational Therapy (26 Credit Hours)**
- NCTRC Certification Prerequisites (May be completed concurrently with graduate course study)
  - Medical Terminology
  - Lifespan Development Psychology
  - Abnormal Psychology
  - Anatomy and Physiology
  - Human Service Elective
  - Human Service Elective
  - **RCRT 5300** Recreation And Adaptation For Special Education 1
  - **RCRT 5640** Rt Intervention: Therapeutic Groups
  - **RCRT 5720** Introduction To Therapeutic Recreation
  - **RCRT 5760** APIE in Recreation Therapy
  - **RCRT 5790** Medical & Clinical Aspects Of Therapeutic Recreation II
  - **RCRT 5810** Clinical: Psychiatric Rehabilitation
  - **RCRT 5830** Clinical: Geriatric
  - **RCRT 5870** Program Planning In Recreational Therapy

Select four (4) courses from the following:
- **RCRT 5620** Animal Assisted Therapy
- **RCRT 5630** Therapeutic Activities
- **RCRT 5660** Relaxation And Stress Management
- **RCRT 5670** RT Intervention: Leisure Education
- **RCRT 5680** RT Intervention: Assistive Technology & Techniques
- **RCRT 5690** RT Intervention: Aquatic Therapy
- **RCRT 5860** Therapeutic Fitness
- **RCRT 5900** RT Intervention: Craft Therapy
- **RCRT 5910** RT Intervention: Horticulture Therapy

Select one(1) course from the following:
- **RCRT 5800** Clinical: Physical Rehabilitation
- **RCRT 5820** Clinical: Mental Retardation/Developmental Disability

**Capstone Option (6 Credit Hours)**
Select one (1) of the following Options: A, B, or C 6

**Option A**
- **RCRT 5940** Internship In Recreation And Leisure
- or **RCRT 6940** Internship

**Option B**
- **RCRT 6920** Master’s Project In Recreation And Leisure

Select one (1) research/statistics course from the following:
- **RESM 5110** Quantitative Methods I
- or **SOC 5290** Social Research Statistics
- **SOC 5290** Social Research Statistics

**Option C**
- **RCRT 6960** Master’s Thesis In Recreation And Leisure

Select one (1) research/statistics course from the following:
- **RESM 5110** Quantitative Methods I
- or **SOC 5290** Social Research Statistics
- **SOC 5290** Social Research Statistics

**Total Hours** 30

1 Denotes online course availability.

### MS in Exercise Science

The school of exercise and rehabilitation sciences offers programming at the graduate level leading to the master of science in exercise science (MSES) degree. Students may choose to specialize in athletic training, biomechanics, or exercise physiology. These specializations involve a combination of courses, seminars, clinical experiences, and research that is intended to prepare individuals for a wide range of careers and advanced study in exercise science and related fields.
• previous academic training: admitted students will typically have an undergraduate degree in exercise science or a closely related area with recommended coursework in human anatomy, physiology, exercise physiology and biomechanics
• academic record: applicants with an undergraduate GPA above 2.75 will be considered for admission; 3.0 in the last 60 hours of the undergraduate program is recommended
• scores on the Graduate Record Exam (GRE)
• letters of recommendation: three letters are required from individuals qualified to assess the individual's potential for success in graduate education, faculty members with specific expertise in kinesiology or closely related area are recommended
• area of study: all applicants must identify their intended area of study within the MSES program.

Admission is competitive. A selected number of students are admitted to each specialization program area depending on space.

Goals and mission statements for the students can be found at: http://www.utoledo.edu/hhs/exercise-science/.

Requirements for Athletic Training Program

Program information for the Post Professional Athletic Training Education Program can be found on our website: http://www.utoledo.edu/hhs/athletictraining/graduate/. Admission requirements for the academic program are as follows:

1. Graduation from a CAATE accredited professional Athletic Training Program;
2. Certification or eligibility for certification by the Board of Certification for Athletic Trainers (BOC);
3. Licensure or eligibility for Ohio Occupational Therapy, Physical Therapy and Athletic Training Board
4. Attainment of a 3.0 cumulative GPA, and a GRE score of 303 (153 verbal and 150) are preferred

Students must have verification of Hepatitis B (3 dose series), MMR, Tdap/DTap, Varicella, 2 step PPD. In addition, students will need to receive a yearly influenza vaccine as well as an annual intradermal TB test. Students are required to submit to a background check on an annual basis as required by their clinical assistantship. Students are responsible for their own transportation to their clinical sites.

Admission to the Post Professional Program is secondary to admission to the College of Graduate Studies. A clinical assistantship is provided to those students who are admitted to the program.

Program of Study for the Master of Science in Exercise Science

The mission of the Post-Professional Athletic Training Program is to expand the depth and breadth of athletic training knowledge and skills beyond that of entry-level. The program seeks to develop clinicians that practice with a patient-centered approach in an effort to optimize the health and well-being of their patients. In addition, the program seeks to develop scholarly clinicians that are capable of providing the high-quality care necessary to contribute to the advancement of the athletic training field. In this cohort program, students are provided the opportunity to foster these skills in the classroom (36 credits) and research laboratories (thesis required), as well as during autonomous clinical education assignments. Full-time students will complete the program in two years.

Cohort program course of study required for all students (36 credit minimum)

Program of Study for the Master of Science in Exercise Science: Concentration in athletic training

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall, Year 1 (9 credits)</td>
<td>KINE 6720 Advanced Clinical Anatomy</td>
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</tr>
<tr>
<td></td>
<td>KINE 6670 Pathology of Orthopedic Injury</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>KINE 6660 Evidence-Based Practice in Sports Medicine</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>KINE 6010 Clinical Applications I</td>
<td>1</td>
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<tr>
<td></td>
<td>KINE 6910 Introduction to Sports Medicine Research I</td>
<td>1</td>
</tr>
<tr>
<td>Spring, Year 1 (9 credits)</td>
<td>KINE 6680 Advanced Interventions I</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>KINE 6410 Clinical Biomechanics</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>KINE 5110 Measurement And Statistical Inference In Human Performance</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>KINE 6020 Clinical Applications II</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>KINE 6920 Introduction to Sports Medicine Research II</td>
<td>1</td>
</tr>
<tr>
<td>Fall, Year 2 ( credits)</td>
<td>KINE 6600 Issues And Management In Athletic Training</td>
<td>3</td>
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<tr>
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<td>KINE 6030 Clinical Applications III</td>
<td>2</td>
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<tr>
<td></td>
<td>KINE 6960 Masters Thesis In Exercises Science</td>
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<tr>
<td>Spring, Year 2 ( credits)</td>
<td>KINE 6690 Advanced Interventions II</td>
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<td>KINE 6040 Clinical Applications IV</td>
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<td>KINE 6960 Masters Thesis In Exercises Science</td>
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<tr>
<td>Total Hours</td>
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Program of Study for the Master of Science in Exercise Science: Biomechanics Specialization (36 cr minimum)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Core Courses</td>
<td>KINE 6100 Physiology Of Exercise</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>KINE 6130 Biomechanics Of Human Motion</td>
<td>3</td>
</tr>
<tr>
<td>Specialization</td>
<td>KINE 6200 Biomechanical Instrumentation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>KINE 6300</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>KINE 6670 Pathology of Orthopedic Injury</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>KINE 6930</td>
<td>3</td>
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<tr>
<td></td>
<td>KINE 6990 Independent Study In Exercise Science</td>
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<tr>
<td></td>
<td>MIME 5230 Dynamics Of Human Movement</td>
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</table>

Required Research/Capstone Experiences
Program of Study for the Master of Science in Exercise Science: Exercise Physiology Specialization
(36 cr minimum)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>KINE 6100</td>
<td>Physiology Of Exercise</td>
<td>3</td>
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<tr>
<td>KINE 6130</td>
<td>Biomechanics Of Human Motion</td>
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<tr>
<td>Specialization</td>
<td>Select 18 credits of the following:</td>
<td>18</td>
</tr>
<tr>
<td>KINE 6420</td>
<td>Cardiopulmonary Exercise Physiology</td>
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<tr>
<td>KINE 6430</td>
<td>Environmental Physiology</td>
<td></td>
</tr>
<tr>
<td>KINE 6440</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KINE 6550</td>
<td>Lab Techniques In Exercise Biology</td>
<td></td>
</tr>
<tr>
<td>KINE 6560</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KINE 6930</td>
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</tr>
<tr>
<td>KINE 6990</td>
<td>Independent Study In Exercise Science</td>
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Program of Study for the Master of Science in Exercise Science: Non-Thesis Option
(36 cr minimum)

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<th>Hours</th>
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<tbody>
<tr>
<td>KINE 6100</td>
<td>Physiology Of Exercise</td>
<td>3</td>
</tr>
<tr>
<td>KINE 6130</td>
<td>Biomechanics Of Human Motion</td>
<td>3</td>
</tr>
<tr>
<td>Specialization</td>
<td>Select 18 credits of the following:</td>
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</tr>
<tr>
<td>KINE 6420</td>
<td>Cardiopulmonary Exercise Physiology</td>
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</tr>
<tr>
<td>KINE 6430</td>
<td>Environmental Physiology</td>
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<tr>
<td>KINE 6440</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KINE 6550</td>
<td>Lab Techniques In Exercise Biology</td>
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<td>KINE 6560</td>
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<tr>
<td>KINE 6930</td>
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<td></td>
</tr>
<tr>
<td>KINE 6990</td>
<td>Independent Study In Exercise Science</td>
<td></td>
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</tbody>
</table>

Occupational Therapy Doctorate

The occupational therapy program provides a sequence of coursework, field placements, and capstone experiences that culminate in the occupational therapy doctorate (OTD). The University of Toledo offered the first OTD in Ohio and the first OTD program in the nation at a public institution. The OTD program is accredited by the:

Accreditation Council for Occupational Therapy Education of the American Occupational Therapy Association
4720 Montgomery Lane
Suite 200
Bethesda, MD 20814-3449
301.652.2682
www.acoteonline.org (http://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). In addition, most states require licensure to practice; however state licenses are usually based on the results of the NBCOT certification examination. A felony conviction may affect a graduate’s ability to sit for the NBCOT certification examination or attain state licensure.

Due to the sequential nature of the curriculum, matriculation to the OTD program occurs fall semester only. Applications may be submitted after July 15th for admission the following academic year. If you have questions, please contact us at occtherapydoctorate@utoledo.edu or 419.530.6670.

The following criteria are used for admission:

- Bachelor degree in any field of study with a minimum cumulative GPA of 3.0 at graduation. The Bachelor degree must be completed prior to starting the program, NOT prior to application.
- GRE with minimum mean percentile rank of 33% across all three sections.
- Completion of the OT Centralized Application System (OTCAS) and payment of fee.
- Completion of The University of Toledo’s OTD supplemental application and payment of fee (including the Prerequisite Completion Plan form and Writing Sample).
- Prerequisites: 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)
  - 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) recommended for the applications to start in Fall 2019 and required after that for all applicants.
• Lifespan Human Development: You may meet this requirement by EITHER:
  i  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
  ii  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)
• UT Writing Sample (found within The University of Toledo’s OTD supplemental). This is not the same as the Personal Statement that is part of the OTCAS application.
• Three letters of recommendation (submitted through the OTCAS application only).

NOTE: You must apply via http://portal.otcas.org to access the OTCAS application. The University of Toledo’s OTD supplemental application is available at apply.utoledo.edu (http://apply.utoledo.edu). The OTCAS portal and UT Supplemental application opens in mid-July for each admission cycle. Refer to the UT Occupational Therapy webpage for detailed admission requirements.

The Program Technical Standards for the Occupational Therapy Doctoral Program can be found published on the program’s website at http://www.utoledo.edu/healthsciences/depts/rehab_sciences/ot/program/admission.html. Students interested in pursuing admission to the program are highly encouraged to refer to these standards in their entirety. However, a brief synopsis of the technical standards are as follows:

In order to successfully complete the Program, students are required to:

• 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.
• To be

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. 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. We expect that any student who requires accommodation to attain course objectives will notify the course instructor at the first opportunity. Reasonable accommodations will comply with the Americans with Disabilities Act and require program and institutional approvals.

Unique features of the program include fieldwork opportunities in every semester, and the opportunity to complete an individualized capstone to develop

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<td>First Term</td>
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<td>Research in OT II</td>
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<td>OCCT 8050</td>
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<td>OCCT 8060</td>
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<td>OCCT 8900</td>
<td>Mentored Capstone Dissemination</td>
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<td>OCCT 8910</td>
<td>Mentored Studies:Capstone Area (or Elective in Capstone Area)</td>
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**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.

**Occupational Therapy Doctorate/PhD in Exercise Science**

The dual degree of occupational therapy doctorate (OTD) and doctor of philosophy (Ph.D.) in exercise science is designed to meet the growing need for occupational therapy faculty members who are prepared to conduct and mentor research. The graduates of the dual degree program will not only have the credentials but also the skills needed for successful careers in academia.

Admission to the OTD/Ph.D. is a two-step process. The first step is admission to the OTD program. See the occupational therapy doctorate section for admission requirements. In the second semester of the OTD program, the student applies for admission to the Ph.D. program. If selected for admission, the student will be officially admitted to the Ph.D. program in exercise science at the beginning of the second year in the OTD program. Students may apply up to 18 credits of their OTD program for credit in the Ph.D. program. Please contact the occupational therapy program at occthetherapydoctorate@utoledo.edu or the program director for graduate exercise science program for more information on the dual degree.

**Occupational Therapy Doctorate/PhD in Health Education**

The dual degree of occupational therapy doctorate (OTD) and doctor of philosophy (Ph.D.) in health education is designed to meet the growing need for occupational therapy faculty members who are prepared to conduct and mentor research. The graduates of the dual degree program will not only have the credentials but also the skills needed for successful careers in academia.

Admission to the OTD/Ph.D. is a two-step process. The first step is to be admitted to the OTD program. See the occupational therapy doctorate section for admission requirements. During the OTD program, the student completes the second step by applying for admission to the Ph.D. in health education. Students may apply up to 18 credits of their OTD program for credit in the Ph.D. program. Please contact the occupational therapy program at occthetherapydoctorate@utoledo.edu or the school of population health for more information on the dual degree.

**PhD in Exercise Science**

The school of exercise and rehabilitation sciences provides qualified students with the opportunity to pursue coursework and research leading to the doctor of philosophy in exercise science. Students work closely with a faculty mentor to design a program that is consistent with the mentor’s research focus and that meets the unique needs of the student. This includes courses, seminars, independent study and research, and may reflect a secondary area of specialization (cognate) that some students choose to pursue. Areas of research include:

- muscle physiology,
- cardiovascular physiology,
- biomechanics of human movement,
- sports injury and rehabilitation.

Typically, graduates of this program go on to pursue careers in higher education teaching and research or post-doctoral research in areas relating to their doctoral specialization.

A unique feature of the program is the possibility for students in the university’s doctorate in physical therapy and the occupational therapy doctorate programs to combine either of these programs with work leading to the completion of the doctor of philosophy in exercise science degree. This option is ideal for students who wish to pursue a career in academics and research relating to physical or occupational therapy.

Prospective students are considered for admission to the doctoral program on the basis of the following:
• the individual’s previous academic training: admitted students will typically have a master’s degree in exercise science or a closely related area.
• the individual’s academic record: the applicant’s undergraduate and graduate academic record should demonstrate the ability for high-level scholarship.
• the applicant’s scores on the Graduate Record Exam (GRE): applicants should have a combined (quantitative and verbal) GRE score above the 50 percentile and outstanding writing.
• the applicant’s letters of recommendation: three letters are required from individuals qualified to assess the applicant’s potential for success in doctoral education.
• the applicant’s intended area of study: applicants must identify their intended area of study within the Ph.D. program and be selected as an advisee by faculty member working in that area.

Students enrolled in the first year of study in the doctor of physical therapy or the occupational therapy doctorate should apply for the doctor of philosophy in exercise science. In addition to the admission criteria above, a faculty member from the student's clinical doctoral program should provide a letter of recommendation and be willing to serve as mentor to the student.

The doctor of philosophy in exercise science requires a minimum of 72 post-master’s credits for completion; all students complete a dissertation as part of the degree process. Of the 72 credits, a minimum of 36 credits will be composed of coursework and an additional minimum of 36 credits will comprise dissertation. All prospective applicants should contact a faculty member in the department of kinesiology to discuss their interests and plans.

Students work closely with a faculty mentor to design a program that meets the unique needs of the individual. The program of study typically requires four years of full-time study. The dual degree program with the clinical doctoral degrees in occupational therapy and physical therapy provide a limited number of courses and competencies that meet the requirements of both degrees.

School of Intervention and Wellness

CHRISTOPHER ROSEMAN, chair

The school of intervention and wellness offers a master’s degree and education specialist degree in school psychology, a master’s degrees in counselor education with concentrations in school counseling and clinical mental health counseling, and a doctorate in counselor education. The school also offers a master’s degree in speech-language pathology.

Degrees Offered

• Certificate in Advanced Intervention for Listening and Spoken Language (p. 156)
• EdS in School Psychology (p. 156)
• MA in Counselor Education (p. 157)
• MA in School Psychology (p. 159)
• MA in Speech Language Pathology (p. 160)
• PhD in Counselor Education (p. 162)

COUN 5010 Professional Orientation To School Counseling
[4 credit hours (4, 0, 0)]
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

COUN 5020 Professional Orientation to Clinical Mental Health Counseling
[4 credit hours (4, 0, 0)]
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, Fall

COUN 5110 Career Counseling And Development
[3 credit hours (3, 0, 0)]
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: Summer, Fall

COUN 5120 Individual And Group Assessment
[3 credit hours (3, 0, 0)]
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 (4, 0, 0)]
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.
Term Offered: Spring, Summer, Fall

COUN 5140 Counseling Theories And Techniques
[4 credit hours (4, 0, 0)]
Includes a study of basic counseling and consultation theories and helping relationships from individual, group, and systemic perspectives. Explores helper and helpee characteristics, sociocultural factors, and legal and ethical considerations. Includes supervised training in counseling and consulting skills and application of theories into counseling practices.
Term Offered: Spring, Summer, Fall

COUN 5150 Counseling Across The Life Span
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 5190 Counseling Practicum
[4 credit hours (0, 0, 4)]
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 5250 Creating Therapeutic Environments For The Aged
[3 credit hours (3, 0, 0)]
Explores the various aspects necessary for creating therapeutic physical and social psychological settings for older institutionalized adults. Models of care giving and programmatic skills are examined.

COUN 5980 Special Topics In Counseling, Mental Health, And School Psychology
[1-8 credit hours (0, 0, 1-8)]
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: Summer

COUN 6210 Psychopathology
[4 credit hours (4, 0, 0)]
The study of various paradigms for conceptualizing psychopathology related to children, adolescents and adults. Includes study of specific personality theories and their application to clinical counseling.
Term Offered: Spring

COUN 6220 Child, Adolescent, Family Therapy
[3 credit hours (3, 0, 0)]
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
Term Offered: Summer, Fall

COUN 6230 Crisis Intervention Counseling
[3 credit hours (3, 0, 0)]
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
Term Offered: Fall

COUN 6240 Diagnosis And Mental Health
[4 credit hours (4, 0, 0)]
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 6470 Drugs And Mental Health Counseling
[4 credit hours (4, 0, 0)]
This course includes instruction on the neuroanatomy of the nervous system, the physiology of the neuron, and the processes involved in synaptic transmission. The psychobiological and psychophysiological effects of various psychotropic medications typically used in the treatment of mental disorder will be investigated. Integration of pharmacotherapy and psychotherapy in the treatment of mental, emotional, and substance use disorders will also be considered.
Term Offered: Spring, Summer, Fall

COUN 6500 Advanced Theory And Practice Of Career Counseling
[3 credit hours (3, 0, 0)]
Advanced study in theories pertaining to the principles and practice of career counseling. Special emphasis on research, legal and ethical issues, and the role of culture in career choice and development.

COUN 6720 Advocacy for the Survivor of Child Neglect and Abuse
[3 credit hours (0, 0, 3)]
This course prepares students to recognize the long term cognitive, social, and emotional effects of child maltreatment. Evidenced-based approaches for effective advocacy and for treatment of the survivor are examined.
Prerequisites: SOCW 6700 and CRIM 6710
Term Offered: Spring

COUN 6920 Master's Research Project
[1-3 credit hours (0, 0, 0-3)]
In this capstone experience, master’s students review the literature, report implications and produce a project which can be applied in counseling-related settings. This can substitute for CMHS 6930.

COUN 6930 Master's Research Seminar
[2-3 credit hours (0, 0, 0-3)]
In this capstone experience, master’s students review and critique the literature and report implications for research, theory and practice on counseling-related topic of interest, approved by the instructor.

COUN 6940 Counseling Internship
[1-8 credit hours (0, 0, 0-16)]
The course is intended to provide counseling students with practical experience in settings where counseling services are offered. It allows students to relate academic and theoretical learning to settings outside the classroom. Field placement also allows student to receive evaluative feedback on their knowledge, attitudes, and skills with clients in the school setting. Since students already have received advanced training in counseling, the staff and the clientele at the placement site should benefit from the services that are provided by students during the placement. Students are expected to assume a broad spectrum of counseling roles and functions. Students are asked to experience as many responsibilities as feasible in the school setting that are similar to the responsibilities of a professional counselor.
Prerequisites: COUN 5190 or CMHS 5190
Term Offered: Spring, Summer, Fall
COUN 6950 Workshop In Counseling, Mental Health, And School Psychology
[1-6 credit hours (0, 0, 0-12)]
Workshops developed around topics of interest and concern to counselors, school psychologists or other mental health care professionals. Practical application of topics will be stressed.

COUN 6960 Master's Research Thesis
[1-3 credit hours (0, 0, 0-3)]
In this capstone experience, master's students complete an original piece of research, including literature review, methods, analysis and discussion. This can substitute for CMHS 6930.

COUN 6990 Master's Independent Study
[1-4 credit hours (0, 0, 0-4)]
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 7010 Professional Orientation To School Counseling
[4 credit hours (4, 0, 0)]
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.

COUN 7130 Group Counseling
[4 credit hours (4, 0, 0)]
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.
Term Offered: Spring, Summer, Fall

COUN 7140 Counseling Theories And Techniques
[4 credit hours (4, 0, 0)]
Includes a study of basic counseling and consultation theories and helping relationships from individual, group, and systemic perspectives. Explores helper and helpee characteristics, sociocultural factors, and legal and ethical considerations. Includes supervised training in counseling and consulting skills and application of theories into counseling practices.
Term Offered: Spring, Fall

COUN 7150 Counseling Across The Life Span
[3 credit hours (3, 0, 0)]
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 7160 Cultural Diversity For Counselors And School Psychologists
[3 credit hours (3, 0, 0)]
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

COUN 7210 Psychopathology
[4 credit hours (4, 0, 0)]
This course is designed as an exploration into various conceptualizations of psychopathology and their implications for assessment, diagnosis, and treatment planning in counseling. The study of various paradigms for conceptualizing psychopathology related to children, adolescents and adults. Includes study of specific personality theories and their application to clinical counseling.
Term Offered: Spring

COUN 7220 Child, Adolescent, Family Therapy
[3 credit hours (3, 0, 0)]
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
Term Offered: Summer, Fall

COUN 7230 Crisis Intervention Counseling
[3 credit hours (3, 0, 0)]
The Crisis Intervention Counseling course (COUN 6230) is designed to develop knowledge and skills in crisis intervention counseling associated with a variety of crisis situations. The course contributes to meeting the Council on Accreditation of Counseling and Related Educational Programs (CACREP) accreditation general
Prerequisites: COUN 5140
Term Offered: Fall

COUN 7240 Diagnosis And Mental Health
[4 credit hours (4, 0, 0)]
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 7510 Supervision In Counseling And School Psychology
[4 credit hours (4, 0, 0)]
Training in supervision models, methods, roles, ethical issues, research and evaluation. Advanced training in consultation.
Term Offered: Spring, Fall
COUN 7520 Education And Leadership In Mental Health Professions
[4 credit hours (4, 0, 0)]
Orient students to the roles and tasks of educators and leaders in mental health professions, curricular issues of programs, professional and ethical issues and current status and future trends in higher education among mental health professions.
Term Offered: Spring

COUN 7530 Advanced Theories Of Counseling And Consultation
[4 credit hours (4, 0, 0)]
This course is designed to provide advanced preparation in theory pertaining to the principles and practice of individual counseling, group work and consultation.
Term Offered: Fall

COUN 7540 Advanced Personality Assessment
[4 credit hours (4, 0, 0)]
This course will focus on the administration, scoring, and interpretation of selected advanced personality assessment instruments. Special emphasis will be given to the MMPI-2, NEO-PI-3, MCMI-III, SASSI-3, and report writing.
Prerequisites: COUN 5120
Term Offered: Fall

COUN 7930 Doctoral Research Seminar
[4 credit hours (4, 0, 0)]
Advanced preparation in research problems, design and implementation of quantitative and qualitative research and methodology in the fields of counseling and supervision.
Term Offered: Spring

COUN 8410 Advanced Practicum In Individual And Group Therapy
[4 credit hours (0, 0, 4)]
Students receive supervised, practical experiences in providing counseling in individual and group modes of services. Advanced therapy skills will be emphasized.
Term Offered: Spring

COUN 8420 Advanced Practicum In Family Therapy
[4 credit hours (0, 0, 4)]
This course is designed to provide specialized opportunity under live supervision to develop specialized skills in family therapy. The student will work in co-therapy with a family experiencing difficulties.

COUN 8440 Advanced Theory And Practice Of Group Counseling
[3 credit hours (3, 0, 0)]
Advanced training and experience in development, dynamics, theories, methods and skills of group counseling and therapy, leadership, research and evaluation and ethical issues as applicable to normal and abnormal populations.

COUN 8450 Couples And Family Therapy
[3 credit hours (3, 0, 0)]
Theories and practice of couples and family counseling are explored. Foundations of systems theories and their application to couples and family therapy are presented.
Prerequisites: (COUN 5140 and COUN 5150)
Term Offered: Spring

COUN 8460 Substance Abuse Counseling
[4 credit hours (4, 0, 0)]
Review of treatment approaches, techniques and programs for counseling individuals and families experiencing substance-related problems.
Term Offered: Spring, Fall

COUN 8470 Drugs And Mental Health Counseling
[4 credit hours (4, 0, 0)]
This course includes instruction on the neuroanatomy of the nervous system, the physiology of the neuron, and the processes involved in synaptic transmission. The psychobiological and psychophysiological effects of various psychotropic medications typically used in the treatment of mental disorder will be investigated. Integration of pharmacotherapy and psychotherapy in the treatment of mental, emotional, and substance use disorders will also be considered.
Term Offered: Spring, Summer

COUN 8480 Advanced Training In Professional, Legal, And Ethical Issues
[4 credit hours (0, 0, 4)]
The content of this course will consider advanced training in contemporary professional, legal, and ethical issues that influence, regulate, or affect the work of counselors, psychologists, and other mental health professionals.
Term Offered: Spring

COUN 8490 Gender Issues In Counseling And Mental Health Services
[3 credit hours (0, 0, 3)]
Examines the effect of gender role and related dynamics upon the psychological functioning of men and women and considers how these issues can be explored in counseling based upon an interactive model of gender roles emphasizing the learned nature of these characteristics.

COUN 8500 Advanced Theory And Practice Of Career Counseling
[3 credit hours (3, 0, 0)]
Advanced study in theories pertaining to the principles and practice of career counseling. Special emphasis on research, legal and ethical issues, and the role of culture in career choice and development.

COUN 8930 Advanced Doctoral Seminar
[3 credit hours (3, 0, 0)]
This seminar will consider problems and provide advanced study. Open only to advanced graduate students.

COUN 8940 Counseling Internship
[1-8 credit hours (0, 0, 0-16)]
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 or CMHS 5190
Term Offered: Spring, Summer, Fall
COUN 8950 Workshop In Counseling, Mental Health, And School Psychology
[1-6 credit hours (0, 0, 0-12)]
Workshops developed around topics of interest and concern to counselors, school psychologists, or other mental health care professionals. Practical application of topics will be stressed.

COUN 8960 Doctoral Research Dissertation
[1-12 credit hours (0, 0, 0-12)]
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

COUN 8980 Special Topics In Counseling, Mental Health, And School Psychology
[1-3 credit hours (0, 0, 0-3)]
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: Summer, Fall

COUN 8990 Doctoral Independent Study
[1-4 credit hours (0, 0, 0-4)]
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: Summer, Fall

SLP 5440 Augmentative Communication Systems
[3 credit hours (3, 0, 0)]

SLP 6000 Advanced Practicum In Communication Disorders
[2 credit hours (0, 0, 6)]
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 (0, 0, 2)]
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
Term Offered: Spring, Summer

SLP 6002 Advanced Practicum III
[2 credit hours (0, 0, 2)]
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 SLP 6001 are a pre-requisite for this course.
Prerequisites: SLP 6000 and SLP 6001

SLP 6010 Diagnostic Practicum In Communication Disorders
[2 credit hours (0, 0, 6)]
Provides a minimum of 30 hours supervised diagnostic practicum with a variety of communicatively disordered cases.
Corequisites: SLP 6100
Term Offered: Spring, Summer, Fall

SLP 6011 Diagnostic Practicum in Communication Disorders II
[2 credit hours (0, 0, 2)]
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
Term Offered: Summer

SLP 6020 Audiological Practicum In Communication Disorders
[2 credit hours (0, 0, 5)]
Provides the advanced student with supervised practicum hours in the screening, impedance and pure tone threshold testing for audiological diagnosis.
Term Offered: Spring, Summer, Fall

SLP 6030 Research in Speech-Language Pathology
[3 credit hours (3, 0, 0)]
Early graduate course in research methods with emphasis on analysis of current research, application of single-subject research in clinic practicum, and development of research project.
Prerequisites: SLP 6010 (may be taken concurrently) or SLP 6020 (may be taken concurrently)
Term Offered: Spring, Summer, Fall

SLP 6100 Diagnosis Of Speech And Language Disorders
[3 credit hours (3, 0, 0)]
Detailed analysis of formal and informal instruments and procedures designed to evaluate speech and language disorders.
Term Offered: Spring, Summer, Fall

SLP 6101 Diagnosis Of Speech And Language Disorders
[6 credit hours (6, 0, 0)]
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
Term Offered: Spring, Summer, Fall

SLP 6102 Review Of Speech And Language Disorders
[3 credit hours (3, 0, 0)]
Provides the advanced student with supervised practicum hours in the screening, impedance and pure tone threshold testing for audiological diagnosis.
Term Offered: Spring, Summer, Fall

SLP 6300 Phonological And Articulatory Disorders
[3 credit hours (3, 0, 0)]
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 (5, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Introduction to the study and application of assistive technology, including augmentative 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 (3, 0, 0)]
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 (3, 0, 0)]
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 6670 Voice Disorders [3 credit hours (3, 0, 0)]

SLP 6700 Assessment And Remediation Of Fluency Disorders [3 credit hours (3, 0, 0)]
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 6710 Counseling Skills for Speech-Language Pathologists [3 credit hours (3, 0, 0)]
Provides an overview of the skills necessary to counsel people with communication disorders and their families. Topics include patient-centered practice, interviewing, information-giving, psychological sequelae of communication disorders, and family systems.

SLP 6720 Advanced Readings in Fluency Disorders [3 credit hours (0, 0, 3)]
Reviews seminal and current research studies in fluency disorders. Topics include physiology, psychosocial effects of stuttering, evidence base for stuttering therapy, school-based stuttering therapy, and others based on student interests.

SLP 6730 Innovative Service Delivery in Stuttering [3 credit hours (3, 0, 0)]
Explores innovative service delivery models in stuttering including intensive programs, telepractice, and group therapy. Students will deliver therapy to at least one client who stutters as part of the course.

SLP 6750 Professional Issues in Speech Language Pathology [3 credit hours (3, 0, 0)]
This course will provide students with the opportunity to learn about specific issues related to working in a variety of professional settings.

SLP 6800 Aural Rehabilitation [3 credit hours (3, 0, 0)]
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 6810 Facilitating Auditory Learning and Spoken Language for Children with Hearing Loss [3 credit hours (0, 0, 3)]
The impact of universal newborn hearing screening, early fitting of hearing technology (digital hearing aids and/or cochlear implants), and enrollment in comprehensive early intervention programs has created new opportunities for infants and toddlers with hearing loss to learn to listen and talk. In this course, students will learn the developmental processes that are the underpinning for audition and spoken language acquisition. Specific techniques, strategies, and teaching behaviors to develop listening and spoken language in young children who are deaf or hard of hearing will be demonstrated and explored.
Term Offered: Spring

SLP 6820 Hearing Technology [3 credit hours (0, 0, 3)]
This course will orient speech-language pathology students to hearing technologies that assist persons with hearing impairment (hearing aids, assistive listening and alerting devices, and implantable technologies). The focus will be on providing auditory access to children for the purpose of developing listening and spoken language. Equipment will be demonstrated, current issues will be discussed, and students will be given opportunities to check and troubleshoot equipment.
Term Offered: Fall

SLP 6830 Lang Lit Ac of Child Hear Loss [3 credit hours (0, 0, 3)]
This course examines the relevant research, best practices, and intervention strategies for infants and children with hearing loss.
Term Offered: Spring

SLP 6840 Team Models and Ed Leadership [3 credit hours (0, 0, 3)]
SLPs who work with children who are hearing impaired (HI) must work in collaboration educational professionals, parents, audiologists, and other medical professionals within a team-based model. This course will focus on the skills, knowledge and ethical practices essential to the provision of effective service coordination and teaming for SLPs who work in educational settings with children who are HI. Students will examine various models of teaming and consultation approaches and address issues related to supporting students’ educational achievement in educational settings.
Term Offered: Summer
SLP 6900 Independent Research In Speech-Language Pathology  
[1-5 credit hours (0, 0, 0-5)]  
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: Summer, Fall  

SLP 6920 Master's Research Project In Speech-Language Pathology  
[1-5 credit hours (0, 0, 0-5)]  
The Master's project is an individually designed product.  
Prerequisites: SLP 6930  

SLP 6930 Seminars In Speech-Language Pathology  
[1-5 credit hours (0, 0, 0-5)]  
Seminars will consider problems and provide advanced study in the field of Speech-Language Pathology. A student may register for more than one seminar during a graduate program.  
Term Offered: Spring, Fall  

SLP 6940 Internship In Speech-Language Pathology  
[1-8 credit hours (0, 0, 0-8)]  
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  

SLP 6941 Internship in Speech-Language Pathology II  
[4 credit hours (0, 0, 4)]  
Provides the advanced graduate student with supervised practicum experiences at an off-campus site. This will be the second of three externships completed by the student, with the expectation of students having more time scheduled and more clinical hours across each externship course.  
Prerequisites: SLP 6940  

SLP 6942 Internship in Speech-Language Pathology III  
[6 credit hours (0, 0, 6)]  
Provides the graduate student with supervised practicum experiences at an off-campus site. This is the third internship in a sequence.  
Prerequisites: SLP 6940 and SLP 6941  

SLP 6960 Master Research Thesis In Speech-Language Pathology  
[1-5 credit hours (0, 0, 0-5)]  
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.  
Prerequisites: SLP 6930  
Term Offered: Spring, Summer, Fall  

SLP 6990 Independent Study In Speech-Language Pathology  
[1-5 credit hours (0, 0, 0-5)]  
Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Speech-Language Pathology program. Individual meetings with sponsoring faculty are held.  
Term Offered: Spring, Summer, Fall  

SLP 7610 Orientation to Interprofessional Teaming  
[1 credit hour (0, 0, 1)]  
Orientation to the Graduate Certificate in Teaming in Early Childhood. Focus on individual competencies needed to work collaboratively to meet the needs of young children with disabilities and their families.  
Prerequisites: SPED 5270  
Term Offered: Summer  

SLP 7620 Working Effectively With Team Members  
[1 credit hour (0, 0, 1)]  
This second seminar in the Graduate Certificate in Teaming in Early Childhood focuses on skills and policies that promote best practices in teaming to support young children with disabilities.  
Prerequisites: SLP 7610  
Term Offered: Fall  

SLP 7630 Evidence-Based Practice and Innovation in Interprofessional Teaming  
[1 credit hour (0, 0, 1)]  
This third seminar in the Graduate Certificate in Teaming in Early Childhood provides students the opportunity to reflect on their practicum experiences in teaming to support young children with disabilities.  
Prerequisites: SLP 7620  
Corequisites: SLP 7640  
Term Offered: Spring  

SLP 7640 Practicum in Interprofessional Teaming  
[2 credit hours (0, 0, 2)]  
The practicum is provided an opportunity to engage in interprofessional teaming in order to provide integrated services to young children with special needs in an inclusive setting.  
Prerequisites: SLP 5620  
Corequisites: SLP 5630  
Term Offered: Spring  

SLP 8000 Advanced Practicum In Communication Disorders  
[2 credit hours (0, 0, 5)]  
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: Summer  

SLP 8010 Diagnostic Practicum In Communication Disorders  
[2 credit hours (0, 0, 5)]  
Provides a minimum of 30 hours supervised diagnostic practicum with a variety of communicatively disordered cases.  
Corequisites: SLP 8100  
Term Offered: Summer  

SLP 8020 Audiological Practicum In Communication Disorders  
[2 credit hours (0, 0, 5)]  
Provides the advanced student with supervised practicum hours in the screening, impedance and pure tone threshold testing for audiological diagnosis.  

SLP 8100 Diagnosis Of Speech And Language Disorders  
[3 credit hours (3, 0, 0)]  
Detailed analysis of formal and informal instruments and procedures designed to evaluate speech and language disorders.
SLP 8210 Preschool Language Disorders
[3 credit hours (3, 0, 0)]
The conceptual framework for understanding language disorders in young children. Application and theory of assessment and intervention strategies will be described and discussed.

SLP 8220 Language Disorders In School-Age Children
[2 credit hours (0, 0, 2)]
The conceptual framework for understanding language disorders in school-age children with special emphasis on language assessment and language interventions in school settings.

SLP 8300 Phonological And Articulatory Disorders
[3 credit hours (3, 0, 0)]
Advanced study of phonological and articulatory disorders including developmental apraxia. Focus on phonological differences in multicultural society with emphasis on assessment of disorders and current advances in remediation.

SLP 8400 Neurological Disorders: Aphasia
[3 credit hours (3, 0, 0)]
Advanced course in deficits due to neurological alterations resulting in aphasia. Formal and informal assessment procedures for the diagnosis of aphasia as well as techniques and functional strategies for communicative compensation provide the focus of the course.

SLP 8450 Neurological Disorders: Brain Injury And Dementia
[2 credit hours (2, 0, 0)]
Course in cognitive and linguistics deficits due to trauma and disease to central nervous system. Course focuses on identification and intervention in communication disorders as the result of acquired brain injury/disease. Traumatic brain injury, right hemisphere damage and dementia are addressed.

SLP 8500 Motor Speech Disorders
[3 credit hours (3, 0, 0)]
Adult apraxia and dysarthrias are discussed in relation to neurological organization, disorders and speech characteristics.

SLP 8550 Augmentative And Alternative Communication
[2 credit hours (2, 0, 0)]
The study and application of assistive communication technology for persons who are non-speaking. The course includes characteristics of ACC consumers, design features of augmentative communication devices, assessment strategies to choose a system and intervention strategies to facilitate use of the ACC system.

SLP 8600 Voice Disorders: Diagnosis And Treatment
[3 credit hours (3, 0, 0)]
Advanced course in the evaluation and treatment of voice disorders. Major voice disorders in children and adults are emphasized.

SLP 8650 Dysphagia And Orpharyngeal Disorders
[2 credit hours (2, 0, 0)]
Evaluation and intervention procedures for individuals with communication problems related to structural impairments of the oral cavity and pharynx.

SLP 8670 Voice Disorders
[3 credit hours (3, 0, 0)]

SLP 8700 Assessment And Remediation Of Fluency Disorders
[3 credit hours (3, 0, 0)]
An advanced course to develop skills in the assessment and remediation of fluency disorders with special emphasis on current trends in stuttering therapy.

SLP 8800 Aural Rehabilitation
[3 credit hours (3, 0, 0)]
Advanced care and training in the use of individual and group assistive listening devices, auditory trainers and other aids to augment hearing. Methods for using residual hearing and contextual factors to augment technology is addressed.

Prerequisites: SLP 3400

SLP 8900 Independent Research In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
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.

SLP 8930 Seminars In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
Seminars will consider problems and provide advanced study in the field of Speech-Language Pathology. A student may register for more than one seminar during a graduate program.

SLP 8940 Internship In Speech-Language Pathology
[1-8 credit hours (0, 0, 0-8)]
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.

SLP 8960 Master Research Thesis In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
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.

Prerequisites: SLP 6930

SLP 8990 Independent Study In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Speech-Language Pathology program. Individual meetings with sponsoring faculty are held.

Term Offered: Summer

SPSY 5030 Role And Function Of The School Psychologist
[3 credit hours (3, 0, 0)]
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 (4, 0, 0)]
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: Summer, Fall

SPSY 5060 Prepractica in School Psychology
[2 credit hours (0, 0, 4)]
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 (3, 0, 0)]
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 (4, 0, 0)]
Provides training in standardized and curriculum based academic assessment methods and linking assessment to intervention. Includes instruction in evidence-based interventions, administering, scoring, interpreting, and communicating assessment results in written reports.
Prerequisites: SPSY 5030
Term Offered: Spring, Fall

SPSY 5310 Psychoeducational Assessment And Interventions II
[4 credit hours (4, 0, 0)]
Prerequisites: SPSY 5300 (may be taken concurrently)
Term Offered: Summer

SPSY 5610 Seminar I: Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
Orientation to the Graduate Certificate in Teaming in Early Childhood. Focus on individual competencies needed to work collaboratively to meet the needs of young children with disabilities and their families.
Prerequisites: SPED 5270
Term Offered: Summer

SPSY 5620 Seminar II: Leadership and Advocacy Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This second seminar in the Graduate Certificate in Teaming in Early Childhood focuses on skills and policies that promote best practices in teaming to support young children with disabilities.
Prerequisites: SPED 5270 and SPSY 5610
Term Offered: Summer, Fall

SPSY 5630 Seminar III: Evidence-Based Practice and Innovation in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This third seminar in the Graduate Certificate in Teaming in Early Childhood provides students the opportunity to reflect on their practicum experiences in teaming to support young children with disabilities.
Prerequisites: SPED 5270 and SPSY 5610 and SPSY 5620
Corequisites: SPSY 5640
Term Offered: Spring, Summer

SPSY 5640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
The practicum provides an opportunity to engage in interprofessional teaming in order to provide integrated services to young children with special needs in an inclusive setting.
Prerequisites: SPED 5270 and SPSY 5610 and SPSY 5620
Corequisites: SPSY 5630
Term Offered: Spring, Summer

SPSY 5980 Special Topics In Counseling, Mental Health, And School Psychology
[1-3 credit hours (0, 0, 0-3)]
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
[3 credit hours (3, 0, 0)]
Examination of disorders of childhood adolescence from an ecological perspective, focusing on understanding characteristics and causes, diagnosis both medical and educational, and identification of interventions for school and home.
Term Offered: Spring

SPSY 6990 Master's Independent Study
[1-4 credit hours (0, 0, 0-4)]
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

SPSY 7170 Consultation I: Theories And Techniques
[3 credit hours (3, 0, 0)]
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

SPSY 7180 Consultation II: School and Home Collaboration
[3 credit hours (3, 0, 0)]
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: Summer, Fall

School of Intervention and Wellness
SPSY 7190 Consulting III: School-Community
[4 credit hours (4, 0, 0)]
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

SPSY 7280 Developmental Child Psychopathology
[3 credit hours (3, 0, 0)]
Examination of disorders of childhood adolescence from an ecological perspective, focusing on understanding characteristics and causes, diagnosis both medical and educational, and identification of interventions for school and home.
Term Offered: Spring

SPSY 7310 Psychoeducational Assessment And Interventions II
[4 credit hours (4, 0, 0)]
Prerequisites: SPSY 5300 (may be taken concurrently)
Term Offered: Summer, Fall

SPSY 7320 Psychoeducational Assessment And Interventions III
[4 credit hours (4, 0, 0)]
Provides training and practice in assessment of cognitive and adaptive functioning for school-age children. Includes instruction in administering, scoring, interpreting, and communicating assessment results, and in writing comprehensive written reports.
Prerequisites: SPSY 7310 or SPSY 5310
Term Offered: Spring, Fall

SPSY 7330 PRACTICA IN SCHOOL PSYCHOLOGY
[1-4 credit hours (0, 0, 4)]
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.
Prerequisites: SPSY 5310 or SPSY 7310
Term Offered: Spring, Summer, Fall

SPSY 7340 School Psychology Practicum II
[4 credit hours (0, 0, 4)]
Practice in individual evaluation, assessment and intervention design, with preschool and other special populations. Includes practice in functional behavioral assessment.
Prerequisites: SPSY 7330

SPSY 7510 Supervision In Counseling And School Psychology
[3 credit hours (3, 0, 0)]
Training in supervision models, methods, roles, ethical issues, research and evaluation. Advanced training in consultation.

SPSY 7530 Advanced Theories Of Counseling And Consultation
[4 credit hours (4, 0, 0)]
Advanced preparation in theory pertaining to the principles and practice of individual counseling, group work and consultation.

SPSY 7920 Specialist Research Project
[1-3 credit hours (0, 0, 0-3)]
In this capstone experience, specialist students review the literature, report implications and produce a project which can be applied in school psychology and counseling-related settings.

SPSY 7930 Doctoral Research Seminar
[3 credit hours (3, 0, 0)]
Advanced preparation in research problems, design and implementation of quantitative and qualitative research and methodology in the fields of counseling and supervision.

SPSY 7940 Internship In School Psychology
[1-8 credit hours (0, 0, 0-8)]
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
Term Offered: Spring, Summer, Fall

SPSY 8480 Advanced Training In Professional, Legal, And Ethical Issues
[3 credit hours (0, 0, 3)]
Advanced training in contemporary professional, legal and ethical issues that regulate or affect the work of counselors, psychologists and other mental health professionals.

SPSY 8930 Advanced Doctoral Seminar
[3 credit hours (3, 0, 0)]
This seminar will consider problems and provide advanced study. Open only to advanced graduate students.

SPSY 8950 Workshop In Counseling, Mental Health, And School Psychology
[1-6 credit hours (0, 0, 0-12)]
Workshops developed around topics of interest and concern to counselors, school psychologists, or other mental health care professionals. Practical application of topics will be stressed.

SPSY 8960 Doctoral Research Dissertation
[1-12 credit hours (0, 0, 0-12)]
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.

SPSY 8980 Special Topics In Counseling, Mental Health, And School Psychology
[1-3 credit hours (0, 0, 0-3)]
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

SPSY 8990 Doctoral Independent Study
[1-4 credit hours (0, 0, 0-4)]
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.
Certificate in Advanced Intervention for Listening and Spoken Language

The certificate in advanced intervention for listening and spoken language (HE-LICH-CRG) is designed to provide The University of Toledo speech-language pathology graduate students and working professionals, who are certified and licensed speech-language pathologists, with the knowledge and tools necessary to support listening and spoken language development of children who use advanced hearing technologies.

Graduate students, accepted into The University of Toledo speech-language pathology graduate program, may enroll in the online certificate program concurrently. Graduate students take four additional online courses to earn the HE-LICH-CRG certificate along with the necessary coursework and clinical experience (including working with clients with hearing loss).

Certified and licensed speech-language pathologists, working with children who use advanced hearing technologies to develop listening and spoken language, may also enroll in the four online courses. Individuals applying for the certificate must provide verification of the Certificate of Clinical Competence awarded by the American Speech-Language-Hearing Association and appropriate state licensure, write a letter of intent, provide a letter of recommendation and support from a supervisor, and participate in an interview.

Students enrolled in the HE-LICH-CRG program will be better prepared to work with children with hearing loss and also position themselves for certification as a Listening and Spoken Language Specialist by the Alexander Graham Bell Association for the Deaf (a multi-year process).

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<th>Course</th>
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<td><strong>First Term</strong></td>
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<td>SLP 6810</td>
<td>Facilitating Auditory Learning and Spoken Language</td>
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<td><strong>Second Term</strong></td>
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<td>SLP 6820</td>
<td>Hearing Technology</td>
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<td>Lang Lit Ac of Child Hear Loss</td>
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<td>SLP 6840</td>
<td>Team Models and Ed Leadership</td>
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<td><strong>Total Hours</strong></td>
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Clinical experience: The HE-LICH-CRG certificate also requires clinical experience providing listening and spoken language interventions for children who use advanced hearing technologies. This may be obtained through The University of Toledo graduate program clinical practicum and internship rotation, which includes supervision. Working professionals must arrange a mentorship to support their clinical skill development as part of the certificate program.

To learn more about the certificate in advanced intervention for listening and spoken language, interested persons should contact: Dr. Lori Pakulski at Lori.Pakulski@utoledo.edu.

EdS in School Psychology

The graduate program in school psychology meets the educational 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 program is designed for three years of full-time study.

**Application deadlines for the school psychology program are December 15, February 15, and May 15.**

To apply to the program, applicants must meet the minimum academic prerequisite 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
- GRE scores (taken within the last five years)
- 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. The list of questions to ask during the school psychologist interview as well as other information about the program can be found on the program website. For more information or to ask questions, contact:

Jennifer L. Reynolds
Program Director
jennifer.reynolds21@utoledo.edu (wendy.cochrane@utoledo.edu)
419.530.4301
or
Sue Martin
Department Secretary
Suzanne.martin@utnet.utoledo.edu (smartin@utnet.utoledo.edu)
419.530.2718
The complete program includes approximately 76 credits, 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 30 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.

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<tr>
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<td><strong>First Term</strong></td>
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<td>Consultation I: Theories And Techniques</td>
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<td>SPSY 5030</td>
<td>Role And Function Of The School Psychologist</td>
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<td>EDP 5330</td>
<td>Behavior Management</td>
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<tr>
<td><strong>Second Term</strong></td>
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<tr>
<td>SPSY 5060</td>
<td>Prepractica in School Psychology</td>
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<tr>
<td>SPSY 5300</td>
<td>Psychoeducational Assessment And Interventions I</td>
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<tr>
<td>EDP 5240/7240</td>
<td>Applied Child and Adolescent Development</td>
<td>3</td>
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<tr>
<td>COUN 5160/7160</td>
<td>Cultural Diversity For Counselors And School Psychologists</td>
<td>3</td>
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<tr>
<td><strong>Hours</strong></td>
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<tr>
<td>HSHS 6000</td>
<td>Statistics and Research for Health Science and Human Service Professions</td>
<td>3-5</td>
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<tr>
<td>SPSY 5040</td>
<td>Legal And Ethical Issues For School Psychologists And Counselors</td>
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<tr>
<td><strong>Hours</strong></td>
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<td>1-4</td>
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<tr>
<td><strong>Hours</strong></td>
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<td>Consulting III:School-Community</td>
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<tr>
<td>SPSY 7320</td>
<td>Psychoeducational Assessment And Interventions III</td>
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<td>SPSY 7330</td>
<td>PRACTICA IN SCHOOL PSYCHOLOGY</td>
<td>1-4</td>
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<td><strong>Hours</strong></td>
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<td><strong>9-12</strong></td>
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<tr>
<td>COUN 5140/7140</td>
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<td>SPSY 6260/7260</td>
<td>Developmental Child Psychopathology</td>
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<tr>
<td><strong>Hours</strong></td>
<td></td>
<td><strong>7</strong></td>
</tr>
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<td><strong>Total Hours</strong></td>
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<td><strong>57-86</strong></td>
</tr>
</tbody>
</table>

*Note: Students must take two of four for the M.A. degree and the remaining two courses for the Ed.S. degree.

**MA 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, and a doctoral degree in counselor education. All counselor education 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 accredited by the Council for Accreditation of Counseling and Related Educational Programs and 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.

**School Counseling Licensure Endorsement Program**

Any licensed or license-eligible professional counselor or professional clinical counselor or any student in the clinical mental health counseling program who wants school counselor licensure, but is not seeking admission to the master’s degree in school counseling, must apply for admission to the school counseling licensure endorsement program. The application consists of an application form, official transcripts of graduate work in counseling, three letters of recommendation, and a personal statement clarifying the reasons the applicant wishes to become a licensed school counselor. The applicant may be required to
appear for an interview. Students must be admitted to the endorsement program before they will be permitted to enroll in the required 600 clock-hour internship.

Master of Arts in Counselor Education: Clinical Mental Health Counseling

The master’s degree in the area of clinical mental health counseling is a prerequisite for licensure as a professional counselor or professional clinical counselor in Ohio and other states. It is accredited by the Council for Accreditation of Counseling and Related Educational Programs and is approved by the Ohio Counselor, Social Worker, Marriage and Family Therapist Board. This degree prepares students to work in mental health agencies, substance abuse agencies, private practice, and a wide variety of settings including hospitals, colleges, and the criminal justice system. Applicants expecting to practice outside Ohio or Michigan should consult that state’s counseling board to determine current certification or licensure requirements.

Master of Arts in Counselor Education: School Counseling Program

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 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.
• An official Graduate Record Examination (GRE) score taken within the last five years is required for persons whose undergraduate GPA is below 2.7.
  • Applicants holding a doctoral degree from an accredited college or university are automatically excluded from the requirement to submit an official Graduate Record Examination score.
  • Applicants holding a master’s degree from an accredited college or university and whose cumulative graduate course work meets or exceeds 3.5 on a 4.0 scale are automatically excluded from the requirement to submit an official Graduate Record Examination score.
• 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:

Sue Martin
Department Secretary
smartin@utnet.utoledo.edu
419.530.2718

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.
• An official Graduate Record Examination (GRE) score taken within the last five years is required for persons whose undergraduate GPA is below 2.7.
  • Applicants holding a doctoral degree from an accredited college or university are automatically excluded from the requirement to submit an official Graduate Record Examination score.
  • Applicants holding a master’s degree from an accredited college or university and whose cumulative graduate course work meets or exceeds 3.5 on a 4.0 scale are automatically excluded from the requirement to submit an official Graduate Record Examination score.
• 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. Christopher Roseman, Clinical Mental Health Counseling Program Director at Christopher.Roseman@utoledo.edu (Yanhon.Liu@utoledo.edu)
Program of Study for the Master of Arts in Counselor Education: School Counseling

The master’s degree consists of a minimum of 48 semester hours of study, including a 600 clock hour internship in a school setting. The degree is available for full-time or part-time students.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>First Term</strong></td>
<td></td>
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</tr>
<tr>
<td>COUN 5110</td>
<td>Career Counseling And Development</td>
<td>3</td>
</tr>
<tr>
<td>COUN 5120</td>
<td>Individual And Group Assessment</td>
<td>3</td>
</tr>
<tr>
<td>COUN 5140</td>
<td>Counseling Theories And Techniques</td>
<td>4</td>
</tr>
<tr>
<td>COUN 5150</td>
<td>Counseling Across The Life Span</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>13</strong></td>
</tr>
<tr>
<td><strong>Second Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COUN 5010</td>
<td>Professional Orientation To School Counseling</td>
<td>4</td>
</tr>
<tr>
<td>COUN 5130</td>
<td>Group Counseling</td>
<td>4</td>
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<tr>
<td>COUN 5160</td>
<td>Cultural Diversity For Counselors And School Psychologists</td>
<td>3</td>
</tr>
<tr>
<td>SPsy 5170</td>
<td>Consultation I: Theories And Techniques</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>14</strong></td>
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<tr>
<td><strong>Third Term</strong></td>
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<td></td>
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<tr>
<td>COUN 5190</td>
<td>Counseling Practicum</td>
<td>4</td>
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<tr>
<td>SPsy 5040</td>
<td>Legal And Ethical Issues For School Psychologists And Counselors</td>
<td>4</td>
</tr>
<tr>
<td>or SPED 5000</td>
<td>or Issues In Special Education</td>
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<tr>
<td>HShS 6000</td>
<td>Statistics and Research for Health Science and Human Service Professions</td>
<td>3-5</td>
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<tr>
<td>or RESM 5310</td>
<td>or Educational Research</td>
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<tr>
<td></td>
<td><strong>Elective</strong></td>
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<td></td>
<td><strong>Hours</strong></td>
<td><strong>11-13</strong></td>
</tr>
<tr>
<td><strong>Fourth Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COUN 6940</td>
<td>Counseling Internship</td>
<td>1-8</td>
</tr>
<tr>
<td></td>
<td><strong>Elective</strong></td>
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</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>5-12</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>39-48</strong></td>
</tr>
</tbody>
</table>

Note: Many of these classes are also offered in the summer and some are offered through Distance Learning.

Master of Arts in Counselor Education: Clinical Mental Health Counseling

The curriculum leading to the master of arts degree in counselor education with a specialization in clinical mental health counseling consists of a minimum of 60 semester hours. Applicants seeking licensure as professional counselors or professional clinical counselors in Ohio need to insure that at least 20 of their 60 semester hours of study meet the five areas of clinical practice required by the Ohio Counselor, Social Worker, and Marriage and Family Therapist Board.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td><strong>First Term</strong></td>
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</tr>
<tr>
<td>COUN 5020</td>
<td>Professional Orientation to Clinical Mental Health Counseling</td>
<td>4</td>
</tr>
<tr>
<td>COUN 5110</td>
<td>Career Counseling And Development</td>
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</tr>
<tr>
<td>COUN 5120</td>
<td>Individual And Group Assessment</td>
<td>3</td>
</tr>
<tr>
<td>COUN 6240</td>
<td>Diagnosis And Mental Health</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>14</strong></td>
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<tr>
<td><strong>Second Term</strong></td>
<td></td>
<td></td>
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<td>COUN 5130</td>
<td>Group Counseling</td>
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</tr>
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<td>COUN 5140</td>
<td>Counseling Theories And Techniques</td>
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</tr>
<tr>
<td>COUN 5150</td>
<td>Counseling Across The Life Span</td>
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<td>COUN 5160</td>
<td>Cultural Diversity For Counselors And School Psychologists</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>14</strong></td>
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<td><strong>Third Term</strong></td>
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<td>COUN 5190</td>
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<td>COUN 7540</td>
<td>Advanced Personality Assessment</td>
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<td>3-5</td>
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<td><strong>Fourth Term</strong></td>
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<td><strong>Hours</strong></td>
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<tr>
<td></td>
<td><strong>Total Hours</strong></td>
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</tr>
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</table>

MA in School Psychology

The graduate program in school psychology meets the educational 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 program is designed for three years of full-time study.

Application deadlines for the school psychology program are December 15, February 15, and May 15.

To apply to the program, applicants must meet the minimum academic prerequisite 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
- GRE scores (taken within the last five years)
• 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. The list of questions to ask during the school psychologist interview as well as other information about the program can be found on the program website. For more information or to ask questions, contact:

Jennifer L. Reynolds
Program Director
jennifer.reynolds21@utoledo.edu (wendy.cochrane@utoledo.edu)
419.530.4301

or

Sue Martin
Department Secretary
Suzanne.martin@utnet.utoledo.edu (smartin@utnet.utoledo.edu)
419.530.2718

The complete program includes approximately 76 credits, 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 30 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.

<table>
<thead>
<tr>
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<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
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<tr>
<td>First Term</td>
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<td></td>
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<tr>
<td>SPSY 5060</td>
<td>Prepractica in School Psychology</td>
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<td>SPSY 5170</td>
<td>Consultation I: Theories And Techniques</td>
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<td>SPSY 5030</td>
<td>Role And Function Of The School Psychologist</td>
<td>3</td>
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<tr>
<td>EDP 5330</td>
<td>Behavior Management</td>
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<td>Second Term</td>
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<tr>
<td>SPSY 5060</td>
<td>Prepractica in School Psychology</td>
<td>2</td>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</tr>
<tr>
<td>Second Year</td>
<td></td>
<td></td>
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<tr>
<td>First Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPSY 5310</td>
<td>Psychoeducational Assessment And Interventions II</td>
<td>4</td>
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<td>Consultation II: School and Home Collaboration</td>
<td>3</td>
</tr>
<tr>
<td>SPSY 7330</td>
<td>PRACTICA IN SCHOOL PSYCHOLOGY</td>
<td>1-4</td>
</tr>
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<td></td>
<td>Hours</td>
<td>12</td>
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<tr>
<td>Second Term</td>
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<tr>
<td>SPSY 7190</td>
<td>Consulting III:School-Community</td>
<td>4</td>
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<tr>
<td>SPSY 7320</td>
<td>Psychoeducational Assessment And Interventions III</td>
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<td>PRACTICA IN SCHOOL PSYCHOLOGY</td>
<td>1-4</td>
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<td>Third Term</td>
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<td>COUN 5140</td>
<td>Counseling Theories And Techniques</td>
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<td>SPSY 6260</td>
<td>Developmental Child Psychopathology</td>
<td>3</td>
</tr>
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<td></td>
<td>Hours</td>
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<td>Third Year</td>
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<tr>
<td>First Term</td>
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<tr>
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</tr>
<tr>
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<td>Hours</td>
<td>1-8</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>57-86</td>
</tr>
</tbody>
</table>

*Note: Students must take two of four for the M.A. degree and the remaining two courses for the Ed.S. degree.

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 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); 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 assure 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 assure 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 assure 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); and
- Graduate Record Examination (GRE)

Highest consideration will be given to those with a score above the 40th percentile on the Verbal and the Quantitative sections and a GRE writing score > 4.0. A writing score below 3.5 is not acceptable, and applications with a GRE writing score of 3.0 or below will not be given regular admission. Students are encouraged to retake the GRE to improve their scores if they fall below the required scores.

Each student, while enrolled in the didactic and clinical portions of the speech-language pathology curriculum, is required to complete various immunizations, titters, 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 Hep 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.
The following programs of study assume no deficiencies in normal bases of speech/language/audiology requirements exist.

### Plan of Study

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLP 6000</td>
<td>Advanced Practicum in Communication Disorders</td>
<td>2</td>
</tr>
<tr>
<td>SLP 6001</td>
<td>Advanced Practicum in Communication Disorders II</td>
<td>2</td>
</tr>
<tr>
<td>SLP 6002</td>
<td>Advanced Practicum III</td>
<td>2</td>
</tr>
<tr>
<td>SLP 6010</td>
<td>Diagnostic Practicum in Communication Disorders</td>
<td>2</td>
</tr>
<tr>
<td>SLP 6011</td>
<td>Diagnostic Practicum in Communication Disorders II</td>
<td>2</td>
</tr>
<tr>
<td>SLP 6020</td>
<td>Audiological Practicum in Communication Disorders</td>
<td>2</td>
</tr>
<tr>
<td>SLP 6100</td>
<td>Diagnosis of Speech and Language Disorders</td>
<td>3</td>
</tr>
<tr>
<td>SLP 6210</td>
<td>Language Development and Disorders: Early Childhood Through Adolescence</td>
<td>6</td>
</tr>
<tr>
<td>SLP 6300</td>
<td>Phonological And Articulatory Disorders</td>
<td>3</td>
</tr>
<tr>
<td>SLP 6400</td>
<td>Adult Language and Cognitive Communication Disorders</td>
<td>5</td>
</tr>
<tr>
<td>SLP 6500</td>
<td>Motor Speech Disorders</td>
<td>3</td>
</tr>
<tr>
<td>SLP 6550</td>
<td>Trends in Technology for Communication Disorders</td>
<td>3</td>
</tr>
<tr>
<td>SLP 6600</td>
<td>Voice and Resonance Disorders</td>
<td>3</td>
</tr>
<tr>
<td>SLP 6650</td>
<td>Feeding and Swallowing Disorders</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>41</strong></td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLP 6030</td>
<td>Research in Speech-Language Pathology</td>
<td>3</td>
</tr>
<tr>
<td>SLP 6700</td>
<td>Assessment and Remediation of Fluency Disorders</td>
<td>3</td>
</tr>
<tr>
<td>SLP 6800</td>
<td>Aural Rehabilitation</td>
<td>3</td>
</tr>
</tbody>
</table>
The curriculum leading to the doctor of philosophy degree in counselor education consists of a minimum of 60 semester hours. While the degree allows the student to focus on areas of interest, scholarly preparation resulting in a culminating research dissertation is required.

### 60 Semester Hours beyond Master's in Counseling

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COUN 7510</td>
<td>Supervision In Counseling And School Psychology</td>
<td>4</td>
</tr>
<tr>
<td>COUN 7530</td>
<td>Advanced Theories Of Counseling And Consultation</td>
<td>4</td>
</tr>
<tr>
<td>RESM 8120</td>
<td>Quantitative Methods II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>11</strong></td>
</tr>
<tr>
<td><strong>Second Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COUN 7520</td>
<td>Education And Leadership In Mental Health Professions</td>
<td>4</td>
</tr>
<tr>
<td>COUN 8410</td>
<td>Advanced Practicum In Individual And Group Therapy</td>
<td>4</td>
</tr>
<tr>
<td>RESM 7330</td>
<td>Qualitative Research I: Introduction And Basic Methods</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
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</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>11</strong></td>
</tr>
<tr>
<td><strong>Third Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COUN 8940</td>
<td>Counseling Internship</td>
<td>1-8</td>
</tr>
<tr>
<td>RESM Elective</td>
<td></td>
<td></td>
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<tr>
<td>Elective</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>1-8</strong></td>
</tr>
<tr>
<td><strong>Fourth Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COUN 8940</td>
<td>Counseling Internship</td>
<td>1-8</td>
</tr>
<tr>
<td>COUN 7930</td>
<td>Doctoral Research Seminar</td>
<td>4</td>
</tr>
<tr>
<td>COUN 8480</td>
<td>Advanced Training In Professional, Legal, And Ethical Issues</td>
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</tr>
<tr>
<td>RESM Elective</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>9-16</strong></td>
</tr>
<tr>
<td><strong>Fifth Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COUN 8960</td>
<td>Doctoral Research Dissertation</td>
<td>1-12</td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>1-12</strong></td>
</tr>
</tbody>
</table>

**Sixth Term**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COUN 8960</td>
<td>Doctoral Research Dissertation</td>
<td>1-12</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>34-70</strong></td>
</tr>
</tbody>
</table>

### School of Population Health

**JOSEPH DAKE, chair**

The School 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 the doctor of philosophy degree in health education.

### Degrees Offered

- Certificate in Biostatistics and Epidemiology (p. 169)
- Certificate in Contemporary Gerontological Practice (p. 169)
- Certificate in Disaster Preparedness and Response (p. 170)
- Certificate in Epidemiology (p. 170)
- Certificate in Global Public Health (p. 170)
- Certificate in Occupational Health (p. 171)
- Certificate in Public Health and Emergency Response (p. 171)
- Master of Public Health: Environmental and Occupational Health (p. 172)
- Master of Public Health: Health Promotion and Education (p. 173)
- Master of Public Health: Public Health Epidemiology (p. 175)
- Master of Public Health: Public Health Policy and Law (p. 176)
- Master of Public Health: Generalist (p. 178)
- MS in Occupational Health (p. 179)
- PhD in Health Education (p. 181)

**PUBH 5020 Occupational Health**

[3 credit hours (3, 0, 0)]

Hazardous materials, mathematics, anatomy, and physiology; hazard recognition for harmful agents; methods, standards, recommendations, and instruments used to evaluate hazards; techniques for hazard control; occupational health programs and regulations; communication and ethics.

**Term Offered:** Fall

**PUBH 5060 Occupational Safety**

[3 credit hours (3, 0, 0)]

Safety and health organization, administration, management, services; controlling unsafe conditions/acts relation to construction and buildings, machines, materials handling, pressure vessels, electrical equipment; emergency procedures; communication effectiveness and ethical guidelines/standards.

**Term Offered:** Fall

**PUBH 5160 Environmental Health**

[3 credit hours (3, 0, 0)]

Scientific, regulatory and management principles applicable to human disease associated with food, water, air and soil contamination. Focuses on biology and chemistry of contamination and transformation, exposure monitoring and contaminant control.

**Term Offered:** Spring, Fall
PUBH 5260 Haz Mat and Emerg Response
[3 credit hours (3, 0, 0)]
(terrorism) Disaster preparedness and emergency response; and, personal protective equipment and site assessment/monitoring. This course requires the student to wear personal protective equipment, perform hands on monitoring and sampling, and assess and respond to in class response scenarios.
Term Offered: Spring, Summer, Fall

PUBH 5310 Chemical Agents
[3 credit hours (3, 0, 0)]
Scientific principles and practices applicable to the qualitative and quantitative evaluation of chemical agents associated with human diseases resulting from various environmental exposures. Content includes methods to assess exposures in the workplace.
Term Offered: Spring, Fall

PUBH 5410 Hazard Control
[3 credit hours (0, 0, 0)]
Ventilation; control of indoor and outdoor (ambient) air pollution; operation of dilution and location exhaust ventilation systems; design of ventilation systems; respiratory and other personal protective equipment and programs available or commonly used in the workplace; communication and ethics.
Term Offered: Spring

PUBH 5520 Biological Agents
[3 credit hours (3, 0, 0)]
Scientific principles and practices applicable to the pathogenicity, evaluation and control of microbiological agents, parasitic agents, and some biological vectors associated with human diseases resulting from various environmental exposures. Content includes normal/abnormal human physiology relative to exposure, exposure assessment, and exposure control.
Term Offered: Summer, Fall

PUBH 5620 Physical Agents
[3 credit hours (0, 0, 0)]
Monitor exposure to physical agents; assessment of exposure to physical agents; appropriate exposure control methods of physical agents; professional reports; laws, regulations, recommendations, standards, services related to physical agents; communication and ethics.
Term Offered: Spring

PUBH 5700 Risk Assessment
[3 credit hours (3, 0, 0)]
Human health risk assessment including hazard identification, dos-response assessment, human exposure assessment, and risk characterization are discussed. Emphasis on practice of risk assessment, management, and communication relative to public, environmental, and occupational health and safety.
Term Offered: Summer, Fall

PUBH 5720 Exposure Assessment Strategies
[3 credit hours (3, 0, 0)]
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 or PUBH 600
Term Offered: Spring

PUBH 5870 Genetic Epidemiology
[3 credit hours (3, 0, 0)]
Introduces genetic epidemiology methods, principles of population genetics including linkage and association studies used in assessing familial aggregation, and transmission patterns for identifying the genetic basis of common diseases.
Prerequisites: (PUBH 6000 or PUBH 8000) and (PUBH 6010 or PUBH 8010) or (PUBH 600 or PUBH 800) and (PUBH 601 or PUBH 801)
Term Offered: Summer

PUBH 6000 Biostatistics
[3 credit hours (3, 0, 0)]
An introduction to descriptive statistics including measurement of central tendency, dispersion, relative position, correlation, and regression. Inferential statistical theory, selected nonparametric methods, application of computers, and also occupational exposure assessment will be discussed.
Term Offered: Spring, Fall

PUBH 6010 Public Health Epidemiology
[3 credit hours (3, 0, 3)]
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 (3, 0, 0)]
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, Fall

PUBH 6030 Advanced Epidemiology
[3 credit hours (3, 0, 0)]
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: Summer

PUBH 6040 Advanced Biostatistics
[3 credit hours (3, 3, 0)]
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 (3, 0, 0)]
Introduces genetic epidemiology methods, principles of population genetics including linkage and association studies used in assessing familial aggregation, and transmission patterns for identifying the genetic basis of common diseases.
Prerequisites: (PUBH 6000 or PUBH 8000) and (PUBH 6010 or PUBH 8010) or (PUBH 600 or PUBH 800) and (PUBH 601 or PUBH 801)
Term Offered: Summer
PUBH 6080 Social Determinants of Health
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 6100 Environ/Occup Epidemiology
[3 credit hours (0, 0, 0)]
The course focuses on the application of epidemiological techniques to the study of effects of occupational and environmental exposures. Prerequisite: PUBH600 and 601.

PUBH 6110 Categorical Data Analysis
[3 credit hours (3, 0, 0)]
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 Rausch models, multivariate methods for matched pairs and longitudinal data. The methods are illustrated with SAS and/or SPSS, R.
Term Offered: Spring, Summer

PUBH 6120 Epidemiology Infectious Diseases
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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

PUBH 6160 Reproductive Epidemiology
[3 credit hours (3, 0, 0)]
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 or PUBH 601
Term Offered: Spring

PUBH 6170 Molec and Genomic Epidemiology
[3 credit hours (3, 0, 0)]
Presents concepts and methods of molecular and genetic epidemiology relevant to the study of prevalent diseases in the population. Topics include biomarkers, polymorphism and gene-environment interaction. The evolution and function of the genomics and a synopsis of epidemiological design and analysis are included.

PUBH 6180 Cancer Epidemiology
[3 credit hours (0, 0, 0)]
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 (3, 0, 0)]
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 or PUBH 8000
Term Offered: Fall

PUBH 6200 Methods, Materials for PUBH
[3 credit hours (0, 0, 0)]
Introduces students to resource materials and methods appropriate for public health education. Students will use various mediums of instruction in direct application to public health programs.
Term Offered: Spring, Fall

PUBH 6250 Nutritional Epidemiology
[3 credit hours (0, 0, 0)]

PUBH 6300 Community Health Organization
[3 credit hours (0, 0, 0)]
Focuses on techniques to bring about change in a community's health status through assessment, public advocacy, coalition building, decision-making, planning, policy development, and political influence. Applications will be emphasized.
Term Offered: Spring

PUBH 6330 Public Health and Aging
[3 credit hours (0, 0, 0)]
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: Summer

PUBH 6410 Global Perspectives on Public Health and Disaster Preparedness
[3 credit hours (2, 1, 0)]
This course introduces the introductory healthcare learner (including but not limited to MD, MPH, PA, MSN, MSBS, OT, PT) to specific principles of global perspectives on disaster management and response. Covers epidemiology of various diseases and population health issues from a global and domestic perspective. Employs an all-hazards framework, providing essential skills to function in the event of a catastrophe. Guest speakers from healthcare disciplines who work internationally will present first-hand experiences in managing disasters.
Term Offered: Spring
PUBH 6420 Social Marketing in Health
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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: Summer

PUBH 6460 Health Promotion Programs
[3 credit hours (3, 0, 0)]
PUBH 6500 Disaster Preparedness/Response
[3 credit hours (3, 0, 0)]
PUBH 6510 Issues in Pandemic Preparedness and Response
[3 credit hours (2, 1, 0)]
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

PUBH 6520 Public Health Nutrition
[3 credit hours (0, 0, 0)]
PUBH 6550 Chronic Disease Epidemiology
[3 credit hours (3, 0, 3)]
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 or PUBH 601
Term Offered: Spring, Summer, Fall

PUBH 6560 Interdisciplinary Crisis Management for Medical and Public Health Professionals
[3 credit hours (3, 0, 0)]
The purpose of this semester course is to introduce the interdisciplinary healthcare learner (including but not limited to MD, PA, MPH, MSN, OT and PT students) to specific principles of epidemiology and disaster medicine employing an all-hazards framework and to provide essential skills enabling proper functioning in the event a catastrophe arises in the near future. The course will include lectures, simulation exercises and independent web-assisted content.
Term Offered: Spring, Fall

PUBH 6600 Health Behavior
[3 credit hours (0, 0, 0)]
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 (3, 0, 0)]
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: Fall

PUBH 6630 Public Health Advocacy
[3 credit hours (3, 0, 0)]
An examination of the importance of advocacy for the individual, community, and public health professionals. Special emphasis will be place on developing advocacy-based skills to effectively advocate at the micro and macro level. In addition, students will participate in advocacy efforts external to the university to gain experience that enriches the student's training.
Term Offered: Spring

PUBH 6730 Research Environmental Health
[3 credit hours (0, 0, 3)]
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 Indep Study in Biostatistics
[0-3 credit hours (0, 0, 0)]
This courses addresses areas of biostatistics not covered by a regular course offering. It is intended to provide students the knowledge and experience needed in that area. This course is designed for public health students and could be beneficial to Ph.D. students, specifically those who need advanced statistical techniques for their dissertation. Topics include survival analysis, statistical models in carcinogenesis, statistical genetics, nonparametric statistics and multivariate techniques. May be repeated for credit.
Term Offered: Spring, Summer, Fall
PUBH 6800 Evaluation of Health Programs  
[3 credit hours (3, 0, 0)]  
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 (UT-Main). Prerequisites: HEAL 6460/HEAL 8460; co-requisite: HEAL 6750.  
Term Offered: Spring, Fall

PUBH 6890 Indep Study in Public Health  
[1-3 credit hours (0, 0, 0)]  
The student and instructor will agree on a program of study that will enable the student to achieve specific learning objectives in environmental health. May be repeated for credit.  
Term Offered: Spring, Summer, Fall

PUBH 6950 Integrative Learning Experience  
[2 credit hours (0, 0, 2)]  
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 6960 Internship in Public Health  
[1-4 credit hours (0, 0, 1-4)]  
Comprehensive or focused practical training in environmental and occupational health at a designated agency, organization, or company.  
Term Offered: Spring, Summer, Fall

PUBH 6970 Project in Public Health  
[1-4 credit hours (0, 0, 0)]  
Independent development by a student with approval and guidance by a Major Advisor, of a paper, manual, software, etc. applicable to a specific area of environmental and occupational health.  
Term Offered: Spring, Summer, Fall

PUBH 6980 Seminar in Public Health  
[1-3 credit hours (0, 0, 0)]  
A systematic study of selected topics in public health. Course meets for three consecutive semesters. Students may begin any semester, but must complete in sequence. Students register for one credit each term for a cumulative total of three consecutive semesters. May be repeated for credit.  

PUBH 6990 Thesis Research  
[1-4 credit hours (0, 0, 1-4)]

PUBH 8000 Biostatistics  
[3 credit hours (3, 0, 0)]

PUBH 8010 Public Health Epidemiology  
[3 credit hours (3, 0, 0)]  
This course will present principles of the epidemiology method including problem solving. Various study designs will be discussed, including prospective and retrospective studies, analytical, and experimental methods.  
Term Offered: Spring, Fall

PUBH 8020 Management and Leadership in Public Health  
[3 credit hours (3, 0, 0)]  
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, Fall

PUBH 8030 Advanced Epidemiology  
[3 credit hours (3, 0, 0)]  
The 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: Summer

PUBH 8060 Advanced Biostatistics  
[3 credit hours (3, 0, 0)]

PUBH 8090 Issues in Public Health  
[3 credit hours (3, 0, 0)]  
Examination of various contemporary issues in public health. Included are 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 (3, 0, 0)]

PUBH 8120 Epidemiology Infectious Diseases  
[3 credit hours (3, 0, 0)]  
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: Fall

PUBH 8130 Molecular Epidemiology  
[3 credit hours (3, 0, 0)]  
This course covers both the major theoretical and practical issues of conducting an epidemiology study involving molecular and genomic techniques. The course will emphasize from infectious disease, chronic disease, and cancer research literature.  
Term Offered: Fall

PUBH 8150 Clinical Epidemiology  
[3 credit hours (3, 0, 0)]  
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
PUBH 8160 Reproductive Epidemiology  
[3 credit hours (3, 0, 0)]  
Additional assignments are here for students who will take this course as PUBH 8160. Covers broad reproductive health issues from the pre-conception, pre-natal, delivery, and post-natal periods and emphasizes how these issues affect women, men, babies, and infants. Relevant methodological and programmatic issues will be presented with practical illustrations from domestic and international settings. Guest speakers, including health care providers, will give real world experience and insight to these topics of study.  
Prerequisites: PUBH 6010 and PUBH 8010  
Term Offered: Spring

PUBH 8170 Molecular and Genomic Ep  
[3 credit hours (3, 0, 0)]  

PUBH 8180 Cancer Epidemiology  
[3 credit hours (0, 0, 0)]  
Focusses 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: Summer, Fall

PUBH 8330 Public Health and Aging  
[3 credit hours (0, 0, 3)]  
Examines public health and aging issues in contemporary society. Introduces physical, cognitive, and affective function from a public health perspective. Prevention and health promotion are included.  
Term Offered: Summer

PUBH 8410 Global Perspectives on Public Health and Disaster Preparedness  
[3 credit hours (2, 1, 0)]  
This course introduces the introductory healthcare learner (including but not limited to MD, MPH, PA, MSN, MSBS, OT, PT) to specific principles of global perspectives on disaster management and response. Covers epidemiology of various diseases and population health issues from a global and domestic perspective. Employs an all-hazards framework, providing essential skills to function in the event of a catastrophe. Guest speakers from healthcare disciplines who work internationally will present first-hand experiences in managing disasters.  
Term Offered: Summer

PUBH 8420 Social Marketing in Health  
[3 credit hours (3, 0, 0)]  
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 Ps” 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 8430 Community Mental Health  
[3 credit hours (3, 0, 0)]  
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: Summer

PUBH 8500 Disaster Preparedness/Response  
[3 credit hours (3, 0, 0)]  
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

PUBH 8550 Chronic Disease Epidemiology  
[3 credit hours (3, 0, 3)]  
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 or PUBH 601  
Term Offered: Summer

PUBH 8560 Interdisciplinary Crisis Management for Medical and Public Health Professionals  
[3 credit hours (3, 0, 0)]  
The purpose of this semester course is to introduce the interdisciplinary healthcare learner (including but not limited to MD, MPH, MSN, OT and PT students) to specific principles of epidemiology and disaster medicine employing an all-hazards framework and to provide essential skills enabling proper functioning in the event a catastrophe arises in the near future. The course will include lectures, simulation exercises and independent web-assisted content.  
Term Offered: Spring, Fall

PUBH 8620 Introduction to Health Policy and Health Systems  
[3 credit hours (3, 0, 0)]  
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: Fall

PUBH 8630 Public Health Advocacy  
[3 credit hours (3, 0, 0)]  
An examination of the importance of advocacy for the individual, community, and public health professionals. Special emphasis will be placed on developing advocacy-based skills to effectively advocate at the micro and macro level. In addition, students will participate in advocacy efforts external to the university to gain experience that enriches the student’s training.  
Term Offered: Spring
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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBH 6000/8000</td>
<td>Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6010/8010</td>
<td>Public Health Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6030/8030</td>
<td>Advanced Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6060/8060</td>
<td>Advanced Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6110/8110</td>
<td>Categorical Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>15</td>
</tr>
</tbody>
</table>

Certificate in Contemporary Gerontological Practice

Barbara Kopp Miller, Ph.D., administrative director, Center for Successful Aging

The Graduate Certificate in Contemporary Gerontological Practice at the University of Toledo is offered through the Center for Successful Aging and is designed to provide knowledge about contemporary issues in gerontology and geriatrics and prepare individuals for working with older adults and their families in the current interprofessional health care system.

A unique feature of the Certificate Program is the delivery system. Recognizing that individuals continually balance personal and professional responsibilities, the courses are accessible “24/7” through distance education methods. The five course curriculum is focused on meeting the educational needs of health care professionals and students through effective and innovative educational methods. Minimum credits required for the Certificate in Contemporary Gerontological Practice is 15 credits.

Students are admitted for fall or spring semesters. The application deadline is July 1 for fall admission and November 1 for spring admission. To be considered for admittance into the program, a candidate must:

- Hold a bachelor’s degree from an accredited college or university with a minimum 3.0 undergraduate grade point average. Degrees in progress will be considered. Official transcripts are required;
- Submit two online letters of recommendation;
- Submit a completed online application and the accompanying application fee.

Only online applications through the College of Graduate Studies are accepted.

Students who are currently enrolled in a program at the University of Toledo may apply to the Graduate Certificate Program by submitting an online Request to Add a Graduate Certificate Form. Students will also need to complete a Plan of Study form. The student must be in good standing in her or her current degree. (The accompanying fee is waived.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GERO 5400</td>
<td>Health and Aging</td>
<td>3</td>
</tr>
<tr>
<td>GERO 5410</td>
<td>Issues Contemp Gerontol Pract</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>6</td>
</tr>
<tr>
<td>Second Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GERO 5420</td>
<td>Grief and Bereavement Issues</td>
<td>3</td>
</tr>
<tr>
<td>GERO 5430</td>
<td>Funding Adult Programming</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>6</td>
</tr>
<tr>
<td>Third Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GERO 5440</td>
<td>Independent Study Gerontology (Offered Fall Spring and Summer)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>15</td>
</tr>
</tbody>
</table>
Certificate in Disaster Preparedness and Response

Students will receive training and education related to preparing communities for and responding to any disaster. Apart from synchronous and asynchronous didactic education, the learner will participate in tabletop scenarios, functional exercises, and skill labs, taking full advantage of the University of Toledo’s Jacobs Inter-professional Immersive Simulation Center. This will include weekly exercises, a live, simulated response to a tornado and triaging of victims, and hospital evacuation exercises. Students will receive online and in-person training with the Incident Command System (ICS). Additional skills will be interwoven throughout this program including patient assessment, splinting, suturing, tourniquet application, START and SALT triage, personal protective equipment (PPE) application, decontamination, and more.

The certificate’s strength is its commitment to interdisciplinary education where students from the various health disciplines (e.g. medicine, physician assistant, pharmacy, nursing, EMS, PT, OT, RT, etc.) can work with public health students and where everyone can obtain a better perspective of what each discipline does and how they can form comprehensive health care teams when a disaster occurs. Minimum required credit hours for completion is 12.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBH 5260</td>
<td>Haz Mat and Emerg Response (Offered Summer)</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6090/8090</td>
<td>Issues in Public Health</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6550/8550</td>
<td>Disaster Preparedness/Response (Offered Fall)</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6560/8560</td>
<td>Interdisciplinary Crisis Management for Medical and Public Health Professionals (Offered Spring)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBH 6000/8000</td>
<td>Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6010/8010</td>
<td>Public Health Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6120/8120</td>
<td>Epidemiology Infectious Disease</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6550/8550</td>
<td>Chronic Disease Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

Certificate in Global Public Health

Not currently accepting new admissions.

The 15 credit hours graduate Certificate in Global Public Health will contribute to the development of public health practitioners who understand disparities in health and well-being in underdeveloped regions of the world, and who can develop effective programs to reduce such inequalities and improve the lives of the impoverished. NOCPH MPH students may take this certificate concurrently while earning their MPH; this route requires an additional three courses or 9 credit hours.

**Student Learning Objectives**

Student learning objectives for the Certificate in Global Public Health:

- Summarize the major types and magnitude of global health and environmental problems in developing nations
- Describe the roles of government, globalization, politics, war, famine, disaster, climate change, migration, and other factors on the health, environment, and well-being of people of developing nations
- Summarize the different roles of large and small organizations and institutions in addressing global health problems
- Develop and apply effective programs, methods, and approaches to improve global health and the environment
- Appreciate the cultural differences between Americans and developing nations and be sensitive to other cultures

Certificate in Global Public Health students (non-MPH majors) take the following courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBH 5030</td>
<td>(in development)</td>
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</tr>
<tr>
<td>PUBH 6120</td>
<td>Epidemiology Infectious Disease</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6550</td>
<td>Chronic Disease Epidemiology</td>
<td>3</td>
</tr>
</tbody>
</table>
Certificate in Public Health and Emergency Response

The 12 credit hours graduate Certificate in Public Health and Emergency Response focuses on the characteristics and human health impacts of biological, chemical, and radiological agents; personal protective equipment and decontamination; site monitoring instrumentation and methods; epidemiological investigation and surveillance; and, applicable regulatory standards and recommended professional guidelines for incident recognition, response, and control. NOCPH MPH students may not take this certificate concurrently while earning the MPH.

Student Learning Objectives

Student learning objectives for the Certificate in Public Health and Emergency Response:

- Apply fundamental and advanced principles of statistics, epidemiology, environmental health science, and occupational health science to real-world public health issues and problems
- Objectively and subjectively assess chemical, biological, and physical agents classified as hazardous to humans health (including terrorism agents)
- Conduct fundamental sample collection of media contaminated with hazardous chemical, biological, and physical agents
- Critically analyze and interpret statistical, epidemiological, toxicological, and communicable disease information for prevention and remediation program development and implementation
- Collect and evaluate applicable information to conduct disaster preparation/planning

Certificate in Public Health and Emergency Response students take the following courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBH 5260</td>
<td>Haz Mat and Emerg Response</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6000</td>
<td>Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6010</td>
<td>Public Health Epidemiology</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours: 15
Select one of the following:  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBH 5310</td>
<td>Chemical Agents</td>
</tr>
<tr>
<td>PUBH 5520</td>
<td>Biological Agents</td>
</tr>
<tr>
<td>PUBH 5700</td>
<td>Risk Assessment</td>
</tr>
<tr>
<td>PUBH 6030</td>
<td>Advanced Epidemiology</td>
</tr>
<tr>
<td>PUBH 6120</td>
<td>Epidemiology Infectious Diseases</td>
</tr>
</tbody>
</table>

**Total Hours: 12**

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**Master of Public Health: Environmental and Occupational Health**

The school of population health offers a variety of degree options and graduate courses. In health, a master of public health is offered with five majors.

**MPH Program**

The MPH degree program is fully accredited by the Council on Education for Public Health (CEPH) and requires four semesters to complete as a full-time student. Part-time students take approximately eight semesters to complete the program.

The core competencies for the Master of Public Health are:

**Evidence-based Approaches to Public Health**

1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research, policy or practice

**Public Health & Health Care Systems**

1. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings
2. Discuss the means by which structural bias, social inequities and racism undermine health care and create challenges to achieving health equity at organizational, community, and societal level

**Planning & Management to Promote Health**

1. Assess population needs, assets and capacities that affect communities’ health
2. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
3. Design a population-based policy, program, project, or intervention
4. Explain basic principles and tools of budget and resource management
5. Select methods to evaluate public health programs

**Policy in Public Health**

1. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
2. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
3. Advocate for political, social or economic policies and programs that will improve health in diverse populations
4. Evaluate policies for their impact on public health and health equity

**Leadership**

1. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making
2. Apply negotiation and mediation skills to address organizational or community challenges

**Communication**

1. Select communication strategies for different audiences and sectors
2. Communicate audience-appropriate public health content, both in writing and through oral presentation
3. Describe the importance of cultural competence in communicating public health content

**Interprofessional Practice**

1. Perform effectively on interprofessional teams

**Systems Thinking**

1. Apply systems thinking tools to a public health issue

**Environmental and Occupational Health (ENVH):** Specialists in this field focus 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 as well as in emergencies. The major focus is recognition, evaluation, and control of human exposures to contaminated air, water, soil, and food. Emergency and disaster planning, preparation, and recognition are also emphasized.

**Environmental and Occupational Health (ENVH) major competencies:**

1. Apply fundamental and advanced principles of statistics, epidemiology, environmental health science, and occupational health science to real-world public health issues and problems
2. Objectively and subjectively assess chemical, biological, and physical agents classified as hazardous to human health
3. Conduct fundamental sample collection of media contaminated with hazardous chemical, biological, and physical agents
4. Critically analyze and interpret statistical, epidemiological, toxicological, and communicable disease information for prevention and remediation program development and implementation
5. Collect and evaluate applicable information to perform a risk assessment
6. Make administrative decisions based on recommended measures to reduce or eliminate environmental and occupational health hazards
7. Develop and present administrative, scientific, technical, and/or regulatory reports

Applicants are required to complete an online application, as well as submit official transcripts from all institutions where they have taken courses (transcripts from institutions outside the US must be translated, evaluated, and reported on the 4.00 scale), 3 letters of recommendation (2 of which must be from persons with a graduate degree), a resume, and a letter of statement of purpose.

The GRE is not required for graduates from an accredited US institution with a GPA ≥ 3.00. The GRE may be required by the MPH Admissions Committee for applicants with a GPA < 3.00. The GRE is required for all students graduating from institutions outside the US and any student with a GPA < 2.7.

Regular admission to the MPH program requires:

- An earned bachelor’s degree from an accredited college or university
- GPA ≥ 3.00 (on a 4.00 scale)
- All students must have foundation courses in college-level mathematics, and social sciences
  - Environmental and Occupational Health and Safety majors must also complete college-level courses in organic/inorganic chemistry, organic chemistry and biological science (biology, biochemistry, anatomy, physiology, etc.)
  - Public Health Epidemiology majors also must complete college level courses in biological sciences (e.g., biology, biochemistry, anatomy, physiology, etc.)
  - TOEFL ≥ 550 (paper-based), ≥ 213 (computer-based), or ≥79 (IBT) for applicants who graduated from institutions outside the US.

Provisional admission to the MPH program may be offered with one or more of the following deficiencies:

- Missing foundation course(s)
- GPA < 3.00, but ≥ 2.7

Provisional students take 4 courses (12 credit hours) in the MPH program. Preferably, all 4 courses will be core courses, but 1 major specific course is also allowed. No electives may be taken. Students must attain a B or better in each of these courses to be admitted as a regular status student. Any student not attaining a B or better in these 4 courses could be dismissed from the program.

All MPH students are required to take the following 8 (24 credit hours) core courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>PUBH 6000</td>
<td>Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6010</td>
<td>Public Health Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6020</td>
<td>Management and Leadership in Public Health</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6050</td>
<td>Concepts and Issues in Environmental Health</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 5160</td>
<td>Environmental Health</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6080</td>
<td>Social Determinants of Health</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6950</td>
<td>Integrative Learning Experience</td>
<td>2</td>
</tr>
<tr>
<td>Select one of the following:</td>
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</tbody>
</table>

All ENVH majors are required to take the following 5 (15 credit hours) major specific courses. In addition, all ENVH majors are required to take 2 (6 credit hours) advised electives.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBH 5020</td>
<td>Occupational Health</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 5060</td>
<td>Occupational Safety</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 5310</td>
<td>Chemical Agents</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 5520</td>
<td>Biological Agents</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 5620</td>
<td>Physical Agents</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

**Master of Public Health: Health Promotion and Education**

The school of population health offers a variety of degree options and graduate courses. In health, a master of public health is offered with five majors.

**MPH Program**

The MPH degree program is fully accredited by the Council on Education for Public Health (CEPH) and requires four semesters to complete as a full time student. Part time students take approximately eight semesters to complete the program.

The core competencies for the Master of Public Health are:

**Evidence-based Approaches to Public Health**

1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research, policy or practice

**Public Health & Health Care Systems**

1. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings
2. Discuss the means by which structural bias, social inequities and racism undermine health care and create challenges to achieving health equity at organizational, community, and societal level

**Planning & Management to Promote Health**

1. Assess population needs, assets and capacities that affect communities’ health
2. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
3. Design a population-based policy, program, project, or intervention
4. Explain basic principles and tools of budget and resource management
5. Select methods to evaluate public health programs

Policy in Public Health
1. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
2. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
3. Advocate for political, social or economic policies and programs that will improve health in diverse populations
4. Evaluate policies for their impact on public health and health equity

Leadership
1. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making
2. Apply negotiation and mediation skills to address organizational or community challenges

Communication
1. Select communication strategies for different audiences and sectors
2. Communicate audience-appropriate public health content, both in writing and through oral presentation
3. Describe the importance of cultural competence in communicating public health content

Interprofessional Practice
1. Perform effectively on interprofessional teams

Systems Thinking
1. Apply systems thinking tools to a public health issue

The Health Promotion and Education (HPRO) major focuses on methods for planning, implementing and evaluating educational and behavioral changes as well as programs that enhance health. Graduates are prepared for positions that emphasize program planning, health promotion, health education, disease prevention and social action. Graduates work in business, voluntary, non-profit and governmental agencies at the local, county, state and federal levels.

Health Promotion and Education (HPRO) major competencies:
1. Develop an intervention and survey based on a health theory
2. Demonstrate skills to plan and implement appropriate health programs
3. Explain the contribution of logic models in program development, implementation, and evaluation
4. Identify evidence-based practices to address a variety of public health problems
5. Demonstrate skills to present effective health programs using a variety of techniques and appropriate teaching strategies
6. Develop strategies to organize community members to advocate for change that impacts public health
7. Differentiate the purpose of formative, process, and outcome evaluation
8. Apply program evaluation knowledge and skill using established models

Applicants are required to complete an online application, as well as submit official transcripts from all institutions where they have taken courses (transcripts from institutions outside the US must be translated, evaluated, and reported on the 4.00 scale), 3 letters of recommendation (2 of which must be from persons with a graduate degree), a resume, and a letter of statement of purpose.

The GRE is not required for graduates from an accredited US institution with a GPA $\geq 3.00$. The GRE may be required by the MPH Admissions Committee for applicants with a GPA < 3.00. The GRE is required for all students graduating from institutions outside the US and any student with a GPA < 2.7.

Regular admission to the MPH program requires:
- An earned bachelor's degree from an accredited college or university
- GPA $\geq 3.00$ (on a 4.00 scale)
- All students must have foundation courses in college-level mathematics, and social sciences
  - Environmental and Occupational Health and Safety majors must also complete college-level courses in organic/inorganic chemistry, organic chemistry and biological science (biology, biochemistry, anatomy, physiology, etc.)
  - Public Health Epidemiology majors also must complete college level courses in biological sciences (e.g., biology, biochemistry, anatomy, physiology, etc.)
- TOEFL $> 550$ (paper-based), $> 213$ (computer-based), or $> 79$ (IBT) for applicants who graduated from institutions outside the US.

Provisional admission to the MPH program may be offered with one or more of the following deficiencies:
- Missing foundation course(s)
- GPA < 3.00, but $\geq 2.7$

Provisional students take 4 courses (12 credit hours) in the MPH program. Preferably, all 4 courses will be core courses, but 1 major specific course is also allowed. No electives may be taken. Students must attain a B or better in each of these courses to be admitted as a regular status student. Any student not attaining a B or better in these 4 courses could be dismissed from the program.

All MPH students are required to take the following 8 (24 credit hours) core courses:

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University of Toledo

Master of Public Health: Public Health Epidemiology

The school of population health offers a variety of degree options and graduate courses. In health, a master of public health is offered with five majors.

MPH Program

The MPH degree program is fully accredited by the Council on Education for Public Health (CEPH) and requires four semesters to complete as a full time student. Part time students take approximately eight semesters to complete the program.

The core competencies for the Master of Public Health are:

Evidence-based Approaches to Public Health

1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research, policy or practice

Public Health & Health Care Systems

1. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings

2. Discuss the means by which structural bias, social inequities and racism undermine health care and create challenges to achieving health equity at organizational, community, and societal level

Planning & Management to Promote Health

1. Assess population needs, assets and capacities that affect communities’ health
2. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
3. Design a population-based policy, program, project, or intervention
4. Explain basic principles and tools of budget and resource management
5. Select methods to evaluate public health programs

Policy in Public Health

1. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
2. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
3. Advocate for political, social or economic policies and programs that will improve health in diverse populations
4. Evaluate policies for their impact on public health and health equity

Leadership

1. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making
2. Apply negotiation and mediation skills to address organizational or community challenges

Communication

1. Select communication strategies for different audiences and sectors
2. Communicate audience-appropriate public health content, both in writing and through oral presentation
3. Describe the importance of cultural competence in communicating public health content

Interprofessional Practice

1. Perform effectively on interprofessional teams

Systems Thinking

1. Apply systems thinking tools to a public health issue

Epidemiology involves factors affecting disease and disability in populations. As a fundamental science of public health and preventive medicine, epidemiology traditionally has focused on causation through population studies for both infectious and chronic diseases. Epidemiologists quantify the distribution of diseases and establish determinants of health problems by describing and analyzing the biological, environmental, and behavioral factors affecting health, illness, and premature death. Epidemiologists use descriptive and analytic techniques to gather information on disease occurrence, extend basic
knowledge about the physical, mental, and social processes affecting health, and develop effective disease control measures.

**Public Health Epidemiology (PHEP) major competencies:**

1. Differentiate the major epidemiologic research study designs based on their strengths and limitations
2. Distinguish between the major sources of bias in epidemiologic research (confounding, selection bias, and measurement error) and select the appropriate method to evaluate and reduce bias
3. Apply criteria to support whether or not an association is causal
4. Formulate appropriate public health recommendations using evidence-based practice based on a synthesis of findings across studies found in the scientific literature
5. Design an epidemiologic study to address a question of interest
6. Identify and apply molecular/genetic principles and technologies in public health practice
7. Write a clear description of the rationale, methods, results, and interpretation of an epidemiologic investigation
8. Identify, analyze, and interpret data arising from local, national, or international research and surveillance databases

Applicants are required to complete an online application, as well as submit official transcripts from all institutions where they have taken courses (transcripts from institutions outside the US must be translated, evaluated, and reported on the 4.00 scale), 3 letters of recommendation (2 of which must be from persons with a graduate degree), a resume, and a letter of statement of purpose.

The GRE is not required for graduates from an accredited US institution with a GPA \( \geq 3.00 \). The GRE may be required by the MPH Admissions Committee for applicants with a GPA < 3.00. The GRE is required for all students graduating from institutions outside the US and any student with a GPA < 2.7.

Regular admission to the MPH program requires:

- An earned bachelor’s degree from an accredited college or university
- GPA \( \geq 3.00 \) (on a 4.00 scale)
- All students must have foundation courses in college-level mathematics, and social sciences
  - Environmental and Occupational Health and Safety majors must also complete college-level courses in organic/inorganic chemistry, organic chemistry and biological science (biology, biochemistry, anatomy, physiology, etc.)
  - Public Health Epidemiology majors also must complete college level courses in biological sciences (e.g., biology, biochemistry, anatomy, physiology, etc.)
- TOEFL \( \geq 550 \) (paper-based), \( \geq 213 \) (computer-based), or \( >79 \) (IBT) for applicants who graduated from institutions outside the US.

Provisional admission to the MPH program may be offered with one or more of the following deficiencies:

- Missing foundation course(s)
- GPA < 3.00, but \( \geq 2.7 \)

Provisional students take 4 courses (12 credit hours) in the MPH program. Preferably, all 4 courses will be core courses, but 1 major specific course is also allowed. No electives may be taken. Students must attain a B or better in each of these courses to be admitted as a regular status student. Any student not attaining a B or better in these 4 courses could be dismissed from the program.

All MPH students are required to take the following 8 (24 credit hours) core courses.

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<tbody>
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<td>PUBH 6960</td>
<td>Internship in Public Health</td>
<td>4</td>
</tr>
<tr>
<td>PUBH 6970</td>
<td>Project in Public Health</td>
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</tr>
</tbody>
</table>

**Total Hours** 24

All PHEP majors are required to take the following 5 (15 credit hours) major specific courses. In addition, all PHEP majors are required to take 2 (total of 6 credit hours) advised electives.

<table>
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<tr>
<th>Code</th>
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<tr>
<td>PUBH 6030</td>
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<td>Advanced Biostatistics</td>
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<td>PUBH 6120</td>
<td>Epidemiology Infectious Diseases</td>
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<tr>
<td>PUBH 6550</td>
<td>Chronic Disease Epidemiology</td>
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<tr>
<td>PUBH 6070</td>
<td>Genetic Epidemiology</td>
<td>3</td>
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</tbody>
</table>

or PUBH 6130 Molecular Epidemiology

**Total Hours** 15

**Master of Public Health: Public Health Policy and Law**

Not accepting students. (last admission Fall 2017)

The school of population health offers a variety of degree options and graduate courses. In health, a master of public health is offered with five majors.

**MPH Program**

The MPH degree program is fully accredited by the Council on Education for Public Health (CEPH) and requires four semesters to complete as a full time student. Part time students take approximately eight semesters to complete the program.

The core competencies for the Master of Public Health are:

Evidence-based Approaches to Public Health
1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research, policy or practice

Public Health & Health Care Systems
1. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings
2. Discuss the means by which structural bias, social inequities and racism undermine health care and create challenges to achieving health equity at organizational, community, and societal level

Planning & Management to Promote Health
1. Assess population needs, assets and capacities that affect communities’ health
2. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
3. Design a population-based policy, program, project, or intervention
4. Explain basic principles and tools of budget and resource management
5. Select methods to evaluate public health programs

Policy in Public Health
1. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
2. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
3. Advocate for political, social or economic policies and programs that will improve health in diverse populations
4. Evaluate policies for their impact on public health and health equity

Leadership
1. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making
2. Apply negotiation and mediation skills to address organizational or community challenges

Communication
1. Select communication strategies for different audiences and sectors
2. Communicate audience-appropriate public health content, both in writing and through oral presentation
3. Describe the importance of cultural competence in communicating public health content

Interprofessional Practice
1. Perform effectively on interprofessional teams

Systems Thinking
1. Apply systems thinking tools to a public health issue

The Public Health Policy and Law major focuses on identifying appropriate kinds of legal interventions to address specific public health issues, considering who might pursue these interventions, and weighing the relative merits of such interventions. Students learn about the key concerns and ethical considerations shaping public health law, the relative role of public health professionals and lawyers in exercising these responsibilities, and how to influence health policy and program decision-making using scientific knowledge, analysis, communication, and consensus-building.

Public Health Policy and Law (PHPL) major competencies:
1. Demonstrate how legal rules from cases, statutes, and regulations apply to specific factual situations
2. Interpret when legal authority can intervene in public health based on powers and limitations
3. Select appropriate kinds of legal interventions to address specific public health issues and evaluate the merits of the interventions
4. Evaluate and weigh the relative merits of various local, state, and federal legal interventions for public health
5. Interpret key policy concerns and ethical considerations shaping public health law and distinguish the roles of public health professionals and lawyers in exercising these responsibilities
6. Influence health policy and program decision-making using scientific knowledge, analysis, communication, and consensus building
7. Develop policies and plans that support individual and community health efforts

Applicants are required to complete an online application, as well as submit official transcripts from all institutions where they have taken courses (transcripts from institutions outside the US must be translated, evaluated, and reported on the 4.00 scale), 3 letters of recommendation (2 of which must be from persons with a graduate degree), a resume, and a letter of statement of purpose.

The GRE is not required for graduates from an accredited US institution with a GPA ≥ 3.00. The GRE may be required by the MPH Admissions Committee for applicants with a GPA < 3.00. The GRE is required for all students graduating from institutions outside the US and any student with a GPA < 2.7.

Regular admission to the MPH program requires:
• An earned bachelor’s degree from an accredited college or university
• GPA ≥ 3.00 (on a 4.00 scale)
• All students must have foundation courses in college-level mathematics, and social sciences
  • Environmental and Occupational Health and Safety majors must also complete college-level courses in organic/inorganic chemistry, organic chemistry and biological science (biology, biochemistry, anatomy, physiology, etc.)

The University of Toledo

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• Public Health Epidemiology majors also must complete college level courses in biological sciences (e.g., biology, biochemistry, anatomy, physiology, etc.)
• TOEFL ≥ 550 (paper-based), ≥ 213 (computer-based), or >79 (IBT) for applicants who graduated from institutions outside the US.

Provisional admission to the MPH program may be offered with one or more of the following deficiencies:
• Missing foundation course(s)
• GPA < 3.00, but ≥ 2.7

Provisional students take 4 courses (12 credit hours) in the MPH program. Preferably, all 4 courses will be core courses, but 1 major specific course is also allowed. No electives may be taken. Students must attain a B or better in each of these courses to be admitted as a regular status student. Any student not attaining a B or better in these 4 courses could be dismissed from the program.

All MPH students are required to take the following 8 (24 credit hours) core courses.

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</tr>
<tr>
<td>PUBH 6050 Concepts and Issues in Environmental Health</td>
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Or for ENVH majors only:

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<tr>
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<tbody>
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<td>Project in Public Health</td>
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</tbody>
</table>

Total Hours 24

All PHPL majors are required to take the following 5 (15 credit hours) major specific courses. In addition, all PHPL majors are required to take 2 (6 total credit hours) advised electives.

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<tbody>
<tr>
<td>LAWM 5000</td>
<td>Law And The Legal System</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6620</td>
<td>Introduction to Health Policy and Health Systems</td>
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</tr>
<tr>
<td>PUBH 6630</td>
<td>Public Health Advocacy</td>
<td>3</td>
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<tr>
<td>LAWX XXXX Health Law</td>
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Total Hours 15

**Master of Public Health: Generalist**

The school of population health offers a variety of degree options and graduate courses. In health, a master of public health is offered with five majors.

**MPH Program**

The MPH degree program is fully accredited by the Council on Education for Public Health (CEPH) and requires four semesters to complete as a full time student. Part time students take approximately eight semesters to complete the program.

The core competencies for the Master of Public Health are:

**Evidence-based Approaches to Public Health**

1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research, policy or practice

**Public Health & Health Care Systems**

1. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings
2. Discuss the means by which structural bias, social inequities and racism undermine health care and create challenges to achieving health equity at organizational, community, and societal level

**Planning & Management to Promote Health**

1. Assess population needs, assets and capacities that affect communities’ health
2. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
3. Design a population-based policy, program, project, or intervention
4. Explain basic principles and tools of budget and resource management
5. Select methods to evaluate public health programs

**Policy in Public Health**

1. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
2. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
3. Advocate for political, social or economic policies and programs that will improve health in diverse populations
4. Evaluate policies for their impact on public health and health equity

**Leadership**

1. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making
2. Apply negotiation and mediation skills to address organizational or community challenges
Communication

1. Select communication strategies for different audiences and sectors
2. Communicate audience-appropriate public health content, both in writing and through oral presentation
3. Describe the importance of cultural competence in communicating public health content

Interprofessional Practice

1. Perform effectively on interprofessional teams

Systems Thinking

1. Apply systems thinking tools to a public health issue

The generalist major offers a general overview of public health and factors affecting communication, data, policy, and general health and safety of populations.

Generalist (GENL) major competencies:

1. Assess risk factors and evidence for establishing morbidity and mortality problems
2. Develop a health promotion program
3. Apply advanced statistical techniques for continuous data
4. Select the appropriate methods to communicate and disseminate evaluation findings
5. Apply the appropriate health and safety programs that are available or commonly used in the workplace

Applicants are required to complete an online application, as well as submit official transcripts from all institutions where they have taken courses (transcripts from institutions outside the US must be translated, evaluated, and reported on the 4.00 scale), 3 letters of recommendation (2 of which must be from persons with a graduate degree), a resume, and a letter of statement of purpose.

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Regular admission to the MPH program requires:

- An earned bachelor’s degree from an accredited college or university
- GPA ≥ 3.00 (on a 4.00 scale)
- All students must have foundation courses in college-level mathematics, and social sciences
  - Environmental and Occupational Health and Safety majors must also complete college-level courses in organic/inorganic chemistry, organic chemistry and biological science (biology, biochemistry, anatomy, physiology, etc.)
  - Public Health Epidemiology majors also must complete college level courses in biological sciences (e.g., biology, biochemistry, anatomy, physiology, etc.)
- TOEFL ≥ 550 (paper-based), ≥ 213 (computer-based), or ≥79 (IBT) for applicants who graduated from institutions outside the US.

Provisional admission to the MPH program may be offered with one or more of the following deficiencies:

- Missing foundation course(s)
- GPA < 3.00, but ≥ 2.7

Provisional students take 4 courses (12 credit hours) in the MPH program. Preferably, all 4 courses will be core courses, but 1 major specific course is also allowed. No electives may be taken. Students must attain a B or better in each of these courses to be admitted as a regular status student. Any student not attaining a B or better in these 4 courses could be dismissed from the program.

All MPH students are required to take the following 8 (24 credit hours) core courses.

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Total Hours 24

All GENL majors are required to take the following 5 (15 credit hours) major specific courses. In addition, all GENL majors are required to take 2 (6 total credit hours) advised electives.

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<td>PUBH 6030</td>
<td>Advanced Epidemiology</td>
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<td>PUBH 6060</td>
<td>Advanced Biostatistics</td>
<td>3</td>
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<td>PUBH 6460</td>
<td>Health Promotion Programs</td>
<td>3</td>
</tr>
<tr>
<td>PUBH 6800</td>
<td>Evaluation of Health Programs</td>
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</table>

Total Hours 15

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 profession focuses on prevention of exposure or occurrence and
mitigation of factors and agents that contribute to worker harm, as work-related illnesses and injuries.

The comprehensive and flexible curriculum of the Master of Science in Occupational Health (MSOH) degree – Industrial Hygiene (IH) program 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 and weekends to facilitate graduate study for those engaged in full-time daily employment. The schedule also permits students without applicable practical experience to complete an internship.

The MSOH degree is fully accredited by the Accreditation Board for Engineering and Technology - Applied Science Accreditation Commission (ABET-ASAC) and requires four semesters to complete as a full-time student. Part time students take approximately eight semesters to complete the program.

**Student Learning Objectives**

The MSOH degree-IH program student outcomes state that upon completion of the program, graduates should be able to:

- 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
- Understand physiological and/or toxicological interactions of physical, chemical, biological, and ergonomic agents, factors, and/or stressors with the human body
- Assess qualitative and quantitative aspects of exposure assessment, dose-response, and risk characterization based on applicable pathways and modes of entry
- Calculate, interpret, and apply statistical and epidemiological data
- Recommend and evaluate engineering, administrative, and personal protective equipment controls and/or other interventions to reduce or eliminate hazards
- Demonstrate the importance of appropriate ethical performance and practice
- Demonstrate an understanding of applicable business and managerial practices
- Interpret and apply applicable occupational and environmental regulations
- Participate in the development and implementation of applicable industrial-hygiene-related programs
- Generate, review, and interpret data, whether from original research or other published sources
- Prepare scientific and technical summaries and reports
- Understand fundamental aspects of safety and environmental health
- Understand the necessity of teamwork among management, industrial hygienists, safety specialists, environmental specialists, engineers, and clinicians (i.e. occupational health physicians and nurses)
- Attain recognized professional certification

Applicants are required to complete an online application, as well as submit official transcripts from all institutions where they have taken courses (transcripts from institutions from outside the US must be translated, evaluated, and reported on the 4.00 scale), 3 letters of recommendation (2 of which must be from persons with a graduate degree), a resume, and a letter of interest (statement of purpose).

The GRE is not required for graduates from an accredited US institution with a GPA ≥ 3.00. The GRE may be required by the MPH Admissions Committee for applicants with a GPA < 3.00. The GRE is required for all students graduating from institutions outside the US and for any student with a GPA ≤ 2.7.

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)
- Foundation courses in college-level mathematics (preferably calculus), inorganic chemistry, organic chemistry, physics, biology, and English/writing
- Work experience based on applicability and duration and applicable certifications such as CIH or CSP will also be considered
- TOEFL > 550 (paper-based), > 213 (computer-based), or >79 (iBT) for applicants who graduated from institutions outside the US and whose primary language is not English.

Provisional admission to the MSOH program may be offered with one or more of the following deficiencies:

- Missing foundation course(s)
- GPA < 3.00, but ≥ 2.7

Provisional students take 4 courses (12 credits hours) in the MSOH program. No electives may be taken. Students must attain a B or better in each of these courses to be admitted as a regular status student. Any student not attaining a B or better in these 4 courses could be dismissed from the program.

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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>PUBH 5020</td>
<td>Occupational Health</td>
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<td>Occupational Safety</td>
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<td>PUBH 5160</td>
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<td>PUBH 5260</td>
<td>Haz Mat and Emerg Response</td>
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<tr>
<td>PUBH 5310</td>
<td>Chemical Agents</td>
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<td>PUBH 5410</td>
<td>Hazard Control</td>
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<td>PUBH 5520</td>
<td>Biological Agents</td>
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<td>PUBH 5620</td>
<td>Physical Agents</td>
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<td>PUBH 5700</td>
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</tr>
<tr>
<td>PUBH 6000</td>
<td>Biostatistics</td>
<td>3</td>
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</tbody>
</table>
**PhD in Health Education**

The doctoral degree program in health focuses on advanced study and research in community/health education. The program prepares advanced students to contribute to the field of health through research. Although research and health courses are required, the program is individualized through selection of a cognate and elective courses to develop each student for leadership roles in universities, public service or the private health sector.

An opportunity exists for graduate students interested in pursuing a joint OTD/PhD degree in Occupational Therapy and Health Education. This joint degree program provides occupational therapy students with the clinical practice, advocacy, leadership, research, and scholarship skills needed to pursue careers in higher education. The occupational therapy program provides detailed description of the application process and curriculum. Opportunities also exist for students to take related graduate level courses across campus that lead to certification (e.g., biostatistics and epidemiology, gerontological practice, occupational health, public health and emergency response).

Admission to the program includes completion of a master’s degree from an accredited institution. In addition to the College of Graduate Studies requirements, evaluation of applicants is based on the following criteria:

- completion of the GRE;
- a clearly defined statement of purpose that specifies the area of specialization within the degree program;
- a minimum of three letters of reference from faculty members with specific expertise in health who have worked with the applicant in an academic setting;
- evidence of research and/or writing ability through a master’s thesis, project, paper, report, publication or paper presented to a professional society will be considered;
- international applicants must submit a TOEFL score of 550 or higher

Prospective students should contact the department for further information.

The program requires 12 credits of research core courses, 27 hours of specified health education courses, 12 hours from a related field to fulfill the cognate, 9 credits of approved electives based on the student’s needs and interests, a portfolio, and a dissertation that contributes to the field of health education.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tr>
<td>RESM 8120</td>
<td>Quantitative Methods II</td>
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**Required Courses**

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<td>HEAL 8000</td>
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<tr>
<td>HEAL 8200</td>
<td>Methods And Materials In Public Health</td>
<td>3</td>
</tr>
<tr>
<td>HEAL 8300</td>
<td>Community Health Organization</td>
<td>3</td>
</tr>
<tr>
<td>HEAL 8360</td>
<td>Applied Survey Research In Health</td>
<td>3</td>
</tr>
<tr>
<td>HEAL 8460</td>
<td>Health Promotion Programs</td>
<td>3</td>
</tr>
<tr>
<td>HEAL 8600</td>
<td>Health Behavior</td>
<td>3</td>
</tr>
<tr>
<td>HEAL 8800</td>
<td>Evaluation Of Health Programs</td>
<td>3</td>
</tr>
<tr>
<td>HEAL 8900</td>
<td>Grant Writing In Health Sciences</td>
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</table>

**Elective Courses**

Student must consult with advisor and program committee to select elective courses

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td></td>
<td><strong>Cognate Area</strong></td>
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<tr>
<td></td>
<td>Student must consult with advisor and program committee to specify courses for cognate area</td>
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</tbody>
</table>

**Doctoral Dissertation**

An opportunity exists for graduate students interested in pursuing a joint OTD/PhD degree in Occupational Therapy and Health Education. This joint degree program provides occupational therapy students with the clinical practice, advocacy, leadership, research, and scholarship skills needed to pursue careers in higher education. The occupational therapy program provides detailed description of the application process and curriculum. Opportunities also exist for students to take related graduate level courses across campus that lead to certification (e.g., biostatistics and epidemiology, gerontological practice, occupational health, public health and emergency response).

**School of Social Justice**

**CElia Williamson, chair**

The department of criminal justice, social work and legal specialties offers individual master’s degrees in each of the professions.

**Criminal Justice Program**

The department of criminal justice, social work and legal specialties offers a graduate program leading to a master of arts in criminal justice as well as an optional certificate in juvenile justice. In addition, the department of criminal justice, social work and legal specialties with the College of Law offers a joint degree program leading to the Master of Arts in criminal justice and the juris doctor.
Social Work Program

The school of social justice offers the professional master of social work degree (MSW). The graduate program in social work is fully accredited by the Council on Social Work Education (CSWE).

Degrees Offered

- Certificate in Child Advocacy (p. 185)
- Certificate in Elder Law (p. 185)
- Certificate in Patient Advocacy (p. 185)
- Joint M.A. in Criminal Justice/Juris Doctor (p. 185)
- MA in Criminal Justice (p. 185)
- MSW in Social Work (p. 186)

CRIM 6000 Advanced Theories: Criminal Justice
[3 credit hours (3, 0, 0)]
This course critically examines contributions made by 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 (3, 0, 0)]
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 (3, 0, 0)]
This course is designed to provide students with the opportunity to integrate ethics in an understanding of criminal justice.
Term Offered: Summer

CRIM 6310 Juvenile Justice In The Metropolitan Community
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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: Fall

CRIM 6620 Police And Society
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-3)]
Field placement experience in an approved criminal justice agency to enhance the knowledge of the student.
Term Offered: Spring, Summer, Fall

CRIM 6960 Thesis
[1-6 credit hours (0, 0, 0-3)]
This course involves research leading to a written thesis. Both the topic of the research and the final thesis must be defended and approved by the student’s thesis committee.

CRIM 6980 Special Topics In Criminal Justice
[3 credit hours (3, 0, 0)]
Content will vary as instructors present a single concentration on developments, problems and controversies in criminal justice.
Term Offered: Spring, Summer, Fall

SOCW 5010 Social Work Research Methods And Analysis
[3 credit hours (3, 0, 0)]
Course introduces students to qualitative and quantitative research methodologies, supporting statistical methods as utilized within the social work profession, data analysis technology and evidenced based social work practice concepts.
Term Offered: Summer, Fall

SOCW 5110 Social Work Practice I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 and SOCW 5210
Term Offered: Spring

SOCW 5130 Social Work Practice III
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring
SOCW 5210 Micro Social Work Perspectives In Human Behavior And The Social Environment
[3 credit hours (3, 0, 0)]
Course is organized on a developmental model including social work perspectives 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 (3, 0, 0)]
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
Term Offered: Spring, Summer

SOCW 5330 Policy Issues And Analysis In Social Work
[3 credit hours (3, 0, 0)]
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: Summer, Fall

SOCW 5900 FOUNDATION FIELD EXPERIENCE AND INTEGRATIVE SEMINAR I
[3 credit hours (0, 0, 10)]
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.
Corequisites: SOCW 5010, SOCW 5110, SOCW 5210, SOCW 5330
Term Offered: Fall

SOCW 5910 FOUNDATION FIELD EXPERIENCE AND INTEGRATIVE SEMINAR II
[3 credit hours (0, 0, 16)]
Students continue in the field agency assigned in SOCW 5900; complete 240 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 or SOCW 5120 or SOCW 5220
Corequisites: SOCW 5130
Term Offered: Spring, Summer

SOCW 6030 Research Methods For Macro Social Work Practice
[3 credit hours (3, 0, 0)]
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.
Prerequisites: SOCW 5010
Term Offered: Fall

SOCW 6040 Research Methods For Micro Social Work Practice
[3 credit hours (3, 0, 0)]
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.
Prerequisites: SOCW 5010
Term Offered: Fall

SOCW 6110 Advanced Generalist Practice I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring, Summer

SOCW 6130 Advanced Generalist Practice III
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

SOCW 6140 Advanced Social Work Assessment
[3 credit hours (3, 0, 0)]
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 assessment purposes. Prerequisites all 5000 level corses, advanced standing status or by permission.
Term Offered: Spring, Summer

SOCW 6410 Social Work Micro Practice with Children and Families
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring


SOCW 6460 Social Work Journal Review Seminar I: Child And Family Services
[1 credit hour (0, 0, 1)]
This course enables students to gain a critical understanding and appreciation of the social work literature and research underpinning social work practice in child and family services. Prerequisite: All 5000-level classes and SOCW 6140. Corequisites: SOCW 6110, 6410, or permission of instructor
Term Offered: Spring

SOCW 6470 Social Work Journal Review Seminar II - Child And Family Services
[1 credit hour (0, 0, 1)]
Course provides a more in depth examination and appreciation of social work literature and research underpinning social work practice with children and family services. Prerequisite: SOCW 6110, 6140, 6410 with a B or better. Corequisite: 6430.
Prerequisites: SOCW 6460
Term Offered: Spring

SOCW 6510 Social Work Micro Practice in Mental Health
[3 credit hours (3, 0, 0)]
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.
Term Offered: Fall

SOCW 6530 Social Work Macro Practice in Mental Health
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

SOCW 6560 Social Work Journal Review Seminar I - Mental Health Practice
[1 credit hour (0, 0, 1)]
Course enables students to gain a critical understanding and appreciation of the social work literature and research underpinning social work practice in mental health settings. Prerequisites: All 5000-level classes, advanced standing status, and SOCW 6140. Corequisites: SOCW 6110, 6510, or permission of instructor.
Term Offered: Fall

SOCW 6570 Social Work Journal Review Seminar II - Mental Health Practice
[1 credit hour (0, 0, 1)]
Course provides a more in depth examination and appreciation of social work literature and research underpinning social work practice in mental health settings. Prerequisites: SOCW 6110, 6140, 6510 with a B or better.
Prerequisites: SOCW 6560
Term Offered: Spring

SOCW 6580 Social Work Policy Issues In Aging
[3 credit hours (3, 0, 0)]
Course provides an understanding of social worker's role in aging practice settings. Included are major theoretical perspectives currently accepted in the field with emphasis on strengths and empowerment.

SOCW 6630 Social Work Policy Issues In Aging
[3 credit hours (3, 0, 0)]
Course provides knowledge about the current policy issues concerning social work services for the elderly. Major emphasis is placed on social and economic justice in the resolution of policy conflicts.

SOCW 6660 Social Work Journal Review Seminar I - Aging Services
[1 credit hour (0, 0, 1)]
Course provides an understanding and appreciation of the social work literature and research underpinning social work practice with older adults.

SOCW 6670 Social Work Journal Review Summer II - Aging Services
[1 credit hour (0, 0, 1)]
Course provides a more in depth examination and appreciation of the social work literature and research underpinning social work practice with older adults.
Prerequisites: SOCW 6660
SOCW 6700 Perspectives on Child Maltreatment and Child Advocacy
[3 credit hours (0, 0, 3)]
This course provides a foundation of in-depth information on the child protection system in the U.S., child neglect, child physical abuse, child sexual abuse the investigation, and substantiation of maltreatment, and the role of advocacy in the process.

SOCW 6710 ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR I
[5 credit hours (0, 0, 24)]
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 and SOCW 6410 (may be taken concurrently) or SOCW 6510 (may be taken concurrently) and SOCW 6560
Term Offered: Fall

SOCW 6710 ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR II
[5 credit hours (0, 0, 24)]
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 and SOCW 6430 (may be taken concurrently) or SOCW 6530 (may be taken concurrently)
Term Offered: Fall

SOCW 6960 Thesis
[1-6 credit hours (0, 0, 0-1)]
This course involves research leading to a written thesis. Thesis topic, defense, and final thesis must be approved by the student’s thesis committee.
Term Offered: Fall
Certificate in Elder Law
Not accepting students.

Certificate in Patient Advocacy
Not accepting students.

Joint M.A. in Criminal Justice/Juris Doctor
This program is administered jointly by the College of Law and the criminal justice program. The program is designed for students who wish to have theoretical and practical knowledge in the law and in the field of criminal justice.

- First be accepted by the University of Toledo College of Law
- Successfully complete of the first year of law school
- Be a student in good standing at the University of Toledo College of Law
- Complete an application for the master of arts in criminal justice

To complete the master of arts in criminal justice, the student must meet the degree requirements. Six to nine hours of law courses may be applied as electives in the master of arts in criminal justice, subject to the approval of the CJ graduate advisor.

To qualify for the juris doctor degree, a student must comply with all the academic and non-academic rules of the College of Law. The student must be at least a second year law student before applying for the joint degree. Under the joint program, up to 12 semester hours taken for the Master of Arts in criminal justice may be applied toward the completion of credit hours for juris doctor degree. The student must earn a grade of B or better in those courses to be credited toward the juris doctor.

MA in Criminal Justice
The Master of Arts in criminal justice is designed to provide students with a broad understanding of the criminal justice system, social control and the nature of crime, in addition to developing and improving skills necessary to critically assess criminal justice problems and develop meaningful responses to these problems. The program also provides students with the skills to conduct applied research and evaluation, as well as the ability to understand empirical scholarly publications. The program prepares students for leadership roles in the field of criminal justice and the pursuit of criminal justice doctoral studies. The program allows a person to be either a full-time or part-time student. The program is available as a blend of land-based and online courses. A full-time student can complete the program in one year. A student can complete the program entirely online in two years. A student can also complete the program entirely land based in two years.

In addition to the College of Graduate Studies and College of Health and Human Services requirements, evaluation of applicants for the criminal justice graduate program is based on the following criteria:

- application
- three letters of recommendation
Meeting the minimum admission requirements does not guarantee entrance into the program. Admission is competitive and is dependent on the availability of space within the program. Under special circumstances, the graduate admissions committee may choose to admit a promising applicant as a provisional student in the program.

The Master of Arts in criminal justice requires a minimum of 30 semester hours including core and elective course work. Students should meet with the director of the graduate program in criminal justice to develop a plan of study which must be submitted by the end of the first semester or 12 credits hours. Any electives taken outside of criminal justice must be preapproved by the director of the graduate program in criminal justice. A student may complete a thesis or must pass a comprehensive exam to earn the degree. Within the first semester of graduate study, a student may elect to complete a thesis in lieu of 3 credit hours of elective course work.

### Course Title Hours

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<th>First Term</th>
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<tbody>
<tr>
<td>CRIM 6590</td>
<td>Administration Of Criminal Justice</td>
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</tr>
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<td>CRIM 6200</td>
<td>Data Analysis In Criminal Justice</td>
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<td>CRIM 6400</td>
<td>Graduate Criminal Justice Research Methodology</td>
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<tr>
<td>Elective in CRIM</td>
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<td>Advanced Theories: Criminal Justice</td>
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<tbody>
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<tr>
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<td><strong>Total Hours</strong></td>
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</tr>
</tbody>
</table>

A maximum of 18 hours of elective work must be done in graduate level courses. A maximum of 6 hours may be done in graduate level course work outside of CJ with pre-approval of the CJ graduate advisor.

### MSW in Social Work

The master of social work program has a strong emphasis on social and economic justice. As such, the degree has an advanced generalist concentration, preparing students to create change at all system levels, from individuals to communities. Students may select a specialization in either mental health or in child and family practice.

A 33 hour advanced standing program exists for students who meet specific criteria including a baccalaureate social work degree from an undergraduate social work program accredited by the Counsel of Social Work Education (CSWE). Students with related degrees will not be admitted under advanced standing status, but may be admitted to the 60 hour foundation program.

In addition to the admission criteria established by the College of Graduate Studies at The University of Toledo, the applicant to the MSW program must submit:

- three letters of recommendation from both employers and prior faculty members
- a personal statement that speaks to her/his commitment to social and economic justice as well as the applicant’s professional goals

Additional requirements for admission to the advanced standing program include:

- a baccalaureate degree in social work from a CSWE-accredited social work program
- minimum undergraduate GPA of 3.0
- minimum GPA of 3.3 in social work courses

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 encourage diversity among the students accepted to the program. This includes diversity of gender, age, race/ethnicity, sexual orientation, ability and experience in the profession, etc. Prospective applicants are urged to review information on the program website.

The complete MSW Program requires 60 semester 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 required 900 hours required by CSWE. Six (6) of these hours are taken during the foundation year and ten (10) 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 awarded admission with advanced standing must complete 33 credit hours to obtain the MSW degree. The advanced standing program focuses on advanced generalist and specialty courses.
Program of Study for the Foundation Master of Social Work

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
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<td>First Term</td>
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<td></td>
</tr>
<tr>
<td>SOCW 5110</td>
<td>Social Work Practice I</td>
<td>3</td>
</tr>
<tr>
<td>SOCW 5210</td>
<td>Micro Social Work Perspectives In Human Behavior And The Social Environment</td>
<td>3</td>
</tr>
<tr>
<td>SOCW 5330</td>
<td>Policy Issues And Analysis In Social Work</td>
<td>3</td>
</tr>
<tr>
<td>SOCW 5010</td>
<td>Social Work Research Methods And Analysis</td>
<td>3</td>
</tr>
<tr>
<td>SOCW 5900</td>
<td>FOUNDATION FIELD EXPERIENCE AND INTEGRATIVE SEMINAR I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
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<tr>
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</tr>
<tr>
<td>SOCW 5120</td>
<td>Social Work Practice II</td>
<td>3</td>
</tr>
<tr>
<td>SOCW 5130</td>
<td>Social Work Practice III</td>
<td>3</td>
</tr>
<tr>
<td>SOCW 5220</td>
<td>Macro Social Work Perspectives In Human Behavior And The Social Environment</td>
<td>3</td>
</tr>
<tr>
<td>SOCW 6140</td>
<td>Advanced Social Work Assessment</td>
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</tr>
<tr>
<td>SOCW 5910</td>
<td>FOUNDATION FIELD EXPERIENCE AND INTEGRATIVE SEMINAR II</td>
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</tr>
<tr>
<td></td>
<td>Hours</td>
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</tr>
<tr>
<td>Third Term</td>
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<tr>
<td>SOCW 6110</td>
<td>Advanced Generalist Practice I</td>
<td>3</td>
</tr>
<tr>
<td>Research Elective</td>
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<tr>
<td>SOCW 6110</td>
<td>Advanced Generalist Practice I</td>
<td>3</td>
</tr>
<tr>
<td>Journal Review Seminar I</td>
<td></td>
<td></td>
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<tr>
<td>SOCW 6900</td>
<td>ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR I</td>
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<td>Hours</td>
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<td>Fourth Term</td>
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<tr>
<td>SOCW 6120</td>
<td>Advanced Generalist Practice II</td>
<td>3</td>
</tr>
<tr>
<td>SOCW 6130</td>
<td>Advanced Generalist Practice III</td>
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<tr>
<td>Field of Practice - Mezzo-Macro</td>
<td></td>
<td></td>
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<tr>
<td>Social Work Journal Review Seminar II</td>
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<td></td>
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<tr>
<td>SOCW 6910</td>
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<tr>
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<td>Total Hours</td>
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Program of Study for the Advanced Standing Master of Social Work

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<tr>
<th>Course</th>
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<th>Hours</th>
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<tr>
<td>SOCW 6140</td>
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</tr>
<tr>
<td></td>
<td>Hours</td>
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<td>Second Term</td>
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<tr>
<td>Research Elective</td>
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<td></td>
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<tr>
<td>SOCW 6110</td>
<td>Advanced Generalist Practice I</td>
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<tr>
<td>Field of Practice - Micro</td>
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<tr>
<td>Journal Review Seminar I</td>
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<tr>
<td>SOCW 6900</td>
<td>ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR I</td>
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<tr>
<td></td>
<td>Hours</td>
<td>8</td>
</tr>
<tr>
<td>Third Term</td>
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<td></td>
</tr>
<tr>
<td>SOCW 6120</td>
<td>Advanced Generalist Practice II</td>
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</tr>
<tr>
<td>SOCW 6130</td>
<td>Advanced Generalist Practice III</td>
<td>3</td>
</tr>
<tr>
<td>Field of Practice - Mezzo-Macro</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Journal Review Seminar II</td>
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<tr>
<td>SOCW 6910</td>
<td>ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR II</td>
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<tr>
<td></td>
<td>Hours</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>22</td>
</tr>
</tbody>
</table>

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 School that offers that degree program. Program descriptions are provided in the information under each school.

School of Population Health

Masters Degree Programs

Master of Public Health

- Health Promotion and Education
- Public Health Administration
- Public Health Epidemiology
- Public Health Nutrition

Master of Science in Occupational Health

- Industrial Hygiene

Doctoral Degree Programs

- Doctor of Philosophy in Health Education

Dual Degree Program

- Doctor of Medicine and Master of Public Health


• Students may choose between Social Work Practice in Mental Health, and Child and Family Social Work Practice.
Graduate Degrees/Certificates Offered

(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
- Certificate in Contemporary Gerontological Practice
- Certificate in Disaster Preparedness and Response
- Certificate in Epidemiology
- Certificate in Occupational Health
- Certificate in Public Health and Emergency Response

School of Exercise and Rehabilitation Sciences

Masters Degree Programs
- Master of Science in Exercise Science
  - Applied Biomechanics
  - Exercise Physiology
  - Athletic Training

Master of Arts in Recreation
- Recreation Administration
- Recreation Therapy

Doctoral Degree Programs
- Doctor of Philosophy in Health Education
- Doctor of Philosophy in Exercise Science
- Doctor of Physical Therapy
- Occupational Therapy Doctorate
- Doctor of Philosophy in Counselor Education

School of Intervention and Wellness

Masters Degree Programs
- Master of Arts in Speech-Language Pathology
- Master of Arts in Counselor Education
  - School Counseling Program
  - Clinical Mental Health Counseling

Master of Arts in School Psychology

Doctoral Degree Program
- Doctor of Philosophy in Counselor Education

Educational Specialist Degree Program
- Education Specialist in School Psychology

School of Social Justice

Masters Degree Programs
- Master of Arts in Criminal Justice
- Master of Arts in Criminal Justice and Juris Doctor
  (Offered through the College of Health and Human Services and the College of Law)

Masters in Social Work
College Policies (Graduate Handbook)

3364-80-01 Law Student Handbook (http://www.utoledo.edu/law/studentlife/resources/handbook_policies/conduct.html)

COGS Graduate Student Handbook (http://www.utoledo.edu/graduate/files/Graduate%20Student%20Handbook%202015-2016.pdf)
  • College Policies and Procedures (p. 392)
  • Academic Regulations (p. 394)
  • Other Policies and Information (p. 399)

Application

The applications for the master of studies in law and compliance certificate programs are available at apply.utoledo.edu (http://apply.utoledo.edu).

Master of studies in law and compliance certificate applicants need to:
  • complete an application for graduate study;
  • submit transcripts from all baccalaureate and post-baccalaureate programs attended; and
  • submit a personal statement and resume.
  • Master’s applicants must also submit one letter of recommendation.
  • Applicants may also submit their LSAT, GRE, GMAT or MCAT scores, but no score is required unless their undergraduate GPA is below 2.7 (that requirement does not apply for students who have successfully completed another master’s degree).
  • Students educated outside the U.S. must also submit a TOEFL score and an LSAT, GRE, GMAT or MCAT score.

Admission to the master of studies in law or compliance graduate programs does not require undergraduate or graduate academic preparation in law. To qualify for admission, all applicants must meet the admission criteria set by the College of Graduate Studies at The University of Toledo.

The College of Law will make final recommendations for admission.

For more information, contact the College of Law Director of Communications, Special Programs, and Financial Aid at 419.530.4712 or kirsten.winek@utoledo.edu.
Grading

Master of studies in law and compliance certificate students take some classes side-by-side with J.D. students. However, non-J.D. graduate student grades are determined using the standards associated with other graduate programs at The University of Toledo.

The College of Law permits master of studies in law students to earn up to six credit hours of graduate-level courses in another College at the University of Toledo. To transfer the credits toward the master of studies in law degree, the student must earn a minimum grade of B (or Satisfactory, if graded on a satisfactory/no credit basis) in the non-law graduate course.

Programs Offered

The College of Law offers a master of studies in law degree. The master of studies in law (MLW) is an entry-level graduate degree designed for those who seek a better understanding of the law, legal institutions and legal methods. The master of studies in law program can benefit those who work with lawyers, those whose work is governed by law and regulations, and those in professions where knowledge of the law is valuable. Although designed for professionals to enhance their careers, the master of studies in law program can help re-direct and launch career paths, too. The degree does not qualify the holder to sit for a bar examination or to practice law, nor will it be considered as a qualifier for entry into the J.D. program. Classes taken toward the master of studies in law degree will not be later applied toward a J.D. degree.

Requirements

The Master of Studies in Law program requires students to successfully complete 30 credit hours.

The program is offered on both a full-time and part-time schedule.

The Master of Studies in Law requires students to complete 4 required courses. The required courses are:

- Law and the Legal System (Fall Semester, 2-3 credit hours),
- Lawyering Skills I (Fall Semester, 2 credit hours),
- One additional first-year course (typically Fall Semester, 3-4 credit hours), and
- A seminar or independent research project (2-3 credit hours).

For full-time M.L.W. students, Law and the Legal System, Lawyering Skills I, and the additional first-year course must be taken in the fall semester of the first year.

For the additional first-year course, students can choose from courses such as Property, Torts, Civil Procedure, or Contracts.

The College offers graduate certificates in Health Care Compliance and Higher Education Compliance. Each requires 15 credits of study in compliance and compliance-related courses. Both require the following core courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Elements of Compliance I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Organizational Governance &amp; Compliance</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Essential Elements of Compliance II</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Privacy &amp; Data Security</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

In addition,

- the Health Care Compliance certificate requires Health Law (3 hours); and
- the Higher Education certificate requires Higher Education Law (3 hours).

The programs are designed to be ones that students can complete in 10-12 months on a part-time basis. All classes are offered in an asynchronous, online format.

Students may continue to work full-time while enrolled in the compliance programs. Students may transfer up to 9 credits from the compliance programs to the MLW. Students may take longer than 10-12 months to complete the program if desired.

Graduate Degrees/Certificates Offered

- MLW in Studies in Law (http://www.utoledo.edu/law/mlw)

Sample Master’s Areas of Concentration

Because of the diverse and rich curriculum and the varied scholarly and teaching backgrounds of the instructional staff at the College of Law, master of studies in law students may design specific areas of concentration to fit their particular interests and needs. Sample areas of concentration include business and regulatory compliance, business law, criminal justice law, education law, employment and labor law, environmental law, health law, intellectual property law, international law, real estate law, and trusts and estates. Courses are offered during the day, in the evening, during summer sessions, and in a distance learning format, enabling part-time students to take full advantage of course offerings.
COLLEGE OF MEDICINE & LIFE SCIENCES

2018-2019 graduate Catalog

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 patient centered and high-quality care and by producing nationally recognized research in focused area.

The College of Medicine 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.

Mission

The mission of The University of Toledo College of Medicine and Life Sciences is to improve health in the communities and region we serve. We do this by educating excellent clinicians and scientists, by providing patient centered and high-quality care and by producing nationally recognized research in focused area.

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.

Christopher J. Cooper, M.D.
Executive Vice President for Clinical Affairs
Dean of the College of Medicine & Life Sciences

Health Science Campus
MD Programs
419.383.3680
medadmissions@utoledo.edu

Graduate Programs
419.383.4112
grdsch@utnet.utoledo.edu

College Policies (Graduate Handbook)

COGS Graduate Student Handbook (http://www.utoledo.edu/graduate/files/Graduate%20Student%20Handbook%202015-2016.pdf)
- College Policies and Procedures (p. 392)
- Academic Regulations (p. 394)
- Other Policies and Information (p. 399)

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 tracks.

Admission to Graduate Programs

Admission requirements for College of Graduate Studies are discussed in the general College of Graduate Studies (p. 392) 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 the department and/or 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 are administered jointly by the College of Medicine & Life Sciences and the College of Graduate Studies of the University of Toledo. Students may contact specific departments or programs, the college's graduate advisor, or the College of Graduate Studies for further information on programs or admission requirements. Student should be aware that course names/credit hours may be revised over the course of the program per the department or program requirements. Please consult with your department or 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 complete 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 general academic standards outlined in the general section of the College of Graduate Studies Catalog, for the following programs, a maximum number of credits of C will be allowed on a candidate's Plan of Study as listed below:

- 10 credits PhD degree (biomedical sciences - all tracks)
- 8 credits MSBS research tracks (including CAB, MOME, MMIM, NND, and BIPG); and MSN degree
- 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 Cancer Biology (p. 192)
Department of Medical Microbiology & Immunology (p. 195)
Department of Neurosciences (p. 201)
Department of Orthopaedic Surgery (p. 204)
Department of Pathology (p. 206)
Department of Physician Assistant Studies (p. 209)
Department of Physiology & Pharmacology (p. 217)
Department of Radiology and Department of Radiation Oncology (p. 219)
Division of Dentistry (p. 224)

Department of Cancer Biology

William A. Maltese, Ph.D., chair
Kandace Williams, Ph.D., co-track director
Dayanidhi Raman, PhD., co-track director

The Cancer Biology track within the PhD and MSBS\(^1\) in Biomedical Sciences program at the University of Toledo fosters young scientists to become cutting-edge researchers who understand the molecular genetic basis of cancer and to develop better therapies for the many forms of cancer. Students in the Cancer Biology track develop scientific thinking and laboratory skills to approach cancer research questions in ways that will best lead to success. Graduates of the Cancer Biology program move on to become successful scientists and leaders in academic, government, and industrial settings.

Cancer Biology PhD and MSBS\(^1\) students enroll in a first-year core curriculum that is designed to provide a foundation of 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. In addition, students complete laboratory rotations during the first two semesters to identify a Cancer Biology major advisor and laboratory for their thesis or dissertation research project. PhD students complete three rotations and then may join a Cancer Biology laboratory after the spring semester of their first year. MSBS\(^1\) students complete one rotation and may join a lab the beginning of spring semester of the first year. In year two and beyond, students take advanced courses, journal clubs, and seminars in Cancer Biology, but primarily focus on their thesis or dissertation research. Doctoral students in good academic standing may be supported financially by a tuition scholarship and stipend 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. However, teaching experiences can be arranged if a student desires this training as well. Cancer Biology PhD students generally complete the degree in approximately five years, whereas MSBS students average about 2.5 years.

\(^1\) MSBS in Cancer Biology is not currently offered.

Most faculty members in the Cancer Biology track are the Department of Biochemistry and Cancer Biology in the College of Medicine & Life Sciences at the University of Toledo. Other faculty have primary faculty appointments in other departments within the College of Medicine & Life Sciences or other colleges of the University. The laboratory facilities and shared equipment utilized by Cancer Biology faculty are state of the art.

Degrees Offered

• MSBS in Cancer Biology (p. 193)
• Ph.D in Biomedical Science (p. 194)

CABP 6250 Scientific Communication Skills and Cancer Goals
[2 credit hours (1, 0, 1)]
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 (3, 0, 0)]
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 (1, 0, 0)]
A readings and discussion course that will examine classic and current research publications from within the broad realm of cancer biology.

Term Offered: Spring

CABP 6730 Research in Cancer Biology
[1-15 credit hours (0, 0, 0)]

CABP 6890 Ind Study in Cancer Biology
[1-15 credit hours (0, 0, 0)]
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 Biology
[1-15 credit hours (0, 0, 0)]
CABP 8250 Scientific Communication Skills and Cancer Goals  
[2 credit hours (1, 0, 1)]  
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 (3, 0, 0)]  
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 (1, 0, 0)]  
A readings and discussion course that will examine classic and current research publications from within the broad realm of cancer biology.  
Term Offered: Spring

CABP 8730 Research in Cancer Biology  
[1-15 credit hours (0, 0, 0)]  
CABP 8890 Ind Study in Cancer Biology  
[1-15 credit hours (0, 0, 0)]  
Intensive study in the field of cancer biology including theoretical and experimental work. May be repeated for credit.  
Term Offered: Spring, Summer, Fall

MSBS in Cancer Biology

MSBS in Cancer Biology is not currently offered

The MSBS Qualifying Exam is taken in the summer term of the first year. Prior to completing the exam, students should carry out their thesis research under the course Research in CABP CABP 6730. After passing the Qualifying Exam, students conduct their research under the course Thesis Research (CABP 6990). The minimum number of credits required for MSBS is 40, with a minimum of 25 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 Cancer Biology track.

All Masters students are also required to present posters in the annual UTHSC Graduate Student Research Forum and oral presentations in the annual Larry Gentry Research Symposia beginning in their second year.

Advanced Courses in the Cancer Biology Track

Advanced Cancer Biology  
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;  
• cancer therapies, and  
• overviews of several major types of cancer.

Readings in Cancer Biology  
A readings and discussion course that will examine classic and current research publications from within the broad realm of cancer biology.

Independent Study in Cancer Biology  
In-depth study of research areas chosen by individual faculty. Examples of such topics may be: drug therapy and resistance, hormonal carcinogenesis, and epigenetic mechanisms of oncogenesis.

The minimum number of credits required for MSBS is 40, with a minimum of 25 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 Cancer Biology track.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>First Term</td>
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</tr>
<tr>
<td>Introduction to Biomedical Research $^1$</td>
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<tr>
<td>BMSP 6330 Curr Prob Res App Protein Str $^1$</td>
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<tr>
<td>BMSP 6340 Curr Prob Res App Genes/Genom $^1$</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 6360 Curr Prob Cell Membranes $^1$</td>
<td>3</td>
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<td>BMSP 6380 Methods Biomed Sciences $^1$</td>
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<td>INDI 6020 On Being a Scientist $^1$</td>
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<td>BMSP 6390 Mentored Research $^1$</td>
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<td>Second Term</td>
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<tr>
<td>BMSP 6350 Cell Biology &amp; Signaling $^1$</td>
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<tr>
<td>BMSP 6390 Mentored Research (2 additional rotations possible)</td>
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<tr>
<td>BMSP 6310 Systems Pathophysiology I (optional)</td>
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<tr>
<td>BMSP 6320 Systems Pathophysiology II (optional)</td>
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<tr>
<td>CABP 6730 Research in Cancer Biology</td>
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<tr>
<td>CABP 6890 Ind Study in Cancer Biology (or other Electives) (optional)</td>
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<td></td>
<td>13</td>
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<tr>
<td>Third Term</td>
<td></td>
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<tr>
<td>BMSP 5320 Statistical Methods $^1$</td>
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<td>BIPG 5110 Practical Bioinformatics $^1$</td>
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<tr>
<td>CABP 6730 Research in Cancer Biology $^1$</td>
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<tr>
<td>CABP 6890 Ind Study in Cancer Biology (or other Electives) (optional)</td>
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First Year Qualifying Examination (successful completion required in third term)

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<tr>
<th>Hours</th>
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Fourth Term

<table>
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<tr>
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<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CABP 6270</td>
<td>Advanced Cancer Biology (or take this course in third year)</td>
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Fifth Term

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Sixth Term

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Year 3 (if necessary)

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Ninth Term

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1 Required.

Ph.D in Biomedical Science

Cancer Biology Track

The PhD Qualifying Exam is taken in the spring semester or summer term of the second year. Prior to completing the exam, students should carry out their dissertation research under the course Research in CABP 6730/CABP 8730 or in some cases, Independent Study in CABP 6890/CABP 8890. After passing the Qualifying Exam, students conduct their research under the course Dissertation Research (CABP 9990). The minimum number of credits required for PhD is 90, with a minimum of 25 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 Cancer Biology track.

The minimum number of credits required for PhD is 90, with a minimum of 25 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 Cancer Biology track.

All PhD students are also required to present a seminar on their research in the third year. They are also required to present posters in the annual UTHSC Graduate Student Research Forums and oral presentations in the annual Larry Gentry Research Symposia beginning in their second year.

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Second Term

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Third Term

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<td>Ind Study in Cancer Biology</td>
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<td>BMS 6390/8390</td>
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Ph.D in Biomedical Science
Fourth Term
Term 4 Hours
CABP 6270/8270 Advanced Cancer Biology (or take this course in third year) ¹
Select one or all of the following:
CABP 6730/8730 Research in Cancer Biology ¹
CABP 6890/8890 Ind Study in Cancer Biology
Or other Electives (optional)

Fifth Term
Term 5 Hours
CABP 6560/8560 Readings in Cancer Biology ¹
CABP 6730/8730 Research in Cancer Biology ¹
CABP 6890/8890 Ind Study in Cancer Biology (or other Electives) (optional)

Sixth Term
Term 6 Hours
CABP 6730/8730 Research in Cancer Biology ¹
CABP 6890/8890 Ind Study in Cancer Biology (or other Electives) (optional)
Second Year PhD Qualifying Examination (successful completion required in fifth or sixth term)

Seventh Term
Term 7 Hours
CABP 9990 Dissertation Research CABP ¹
CABP 8270 Advanced Cancer Biology (if not taken in second year) ¹

Eighth Term
Term 8 Hours
CABP 9990 Dissertation Research CABP ¹
CABP 8560 Readings in Cancer Biology ¹

Ninth Term
Term 9 Hours
CABP 9990 Dissertation Research CABP ¹
Third Year Student Seminar (required in seventh or eighth term)

Tenth Term
Year 4 and beyond (9 credits Fall, Spring, 6 credits Summer) 9

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CABP 9990 Dissertation Research CABP (Fall, Spring and Summer Terms)

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¹ Required.

Department of Medical Microbiology & Immunology

Z. Kevin Pan, Ph.D., Chair
Z. Kevin Pan, Ph.D., Co-Track Director
Jason Huntley, Ph.D., Co-Track Director

The Medical Microbiology and Immunology (MMIM) (formerly Infection, Immunity and Transplantation) training program 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 1st 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 1st year and join a MMIM laboratory during the spring semester of their 1st year. In the 2nd 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, Council for Biomedical Graduate Student research forums, and presentations at regional, national, and international conferences. All PhD students in good academic standing (GPA > 3.0) may be supported by a tuition scholarship and stipend 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 his/her 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

- MSBS in Medical Microbiology & Immunology (p. 198)
- Ph.D in Biomedical Science - Medical Microbiology & Immunology (p. 198)
- Ph.D in Biomedical Science - Molecular Medicine (p. 199)

BMSP 5320 Statistical Methods I
[3 credit hours (3, 0, 0)]
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 6250 Grant Writing Workshop
[2 credit hours (2, 0, 0)]
This is an interdisciplinary course designed to teach students skills in developing a research plan in the form of a grant proposal.
Term Offered: Spring

BMSP 6310 Systems Pathophysiology I
[2.5 credit hours (0, 0, 0)]
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 6320 Systems Pathophysiology II
[2.5 credit hours (0, 0, 0)]
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 6330 Curr Prob Res App Protein Str
[2.5 credit hours (2.5, 0, 0)]
The course will cover principles of protein structure/function relationships in proteins, protein folding, ligand-protein interactions and mechanism of enzyme-catalyzed reactions. Special emphasis will be given to the present-day research.
Term Offered: Fall

BMSP 6340 Curr Prob Res App Genes/Genom
[2.5 credit hours (2.5, 0, 0)]
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 (3, 0, 0)]
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 Curr Prob Cell Membranes
[3 credit hours (3, 0, 0)]
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 (1, 0, 0)]
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 Biomed Sciences
[3 credit hours (3, 0, 0)]
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 (1-15, 1-15, 0)]
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 (1, 0, 0)]
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 7320 Statistical Methods I
[3 credit hours (3, 0, 0)]
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 8250 Grant Writing Workshop
[2 credit hours (2, 0, 0)]
This is an interdisciplinary course designed to teach students skills in developing a research plan in the form of a grant proposal.
Term Offered: Spring

BMSP 8310 Systems Pathophysiology I
[2.5 credit hours (0, 0, 0)]
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 8320 Systems Pathophysiology II
[2.5 credit hours (0, 0, 0)]
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 (2.5, 0, 0)]
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
[2.5 credit hours (2.5, 0, 0)]
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 (3, 0, 0)]
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
[3 credit hours (3, 0, 0)]
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
[3 credit hours (3, 0, 0)]
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 (1-15, 1-15, 0)]
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

IITP 6010 Infection Immunity Transplanta
[1 credit hour (1, 0, 0)]
The course will introduce fundamental knowledge of the immune system and its defense mechanisms and the nature and role of microbial pathogens in human and animal diseases.
Term Offered: Summer, Fall

IITP 8010 Infection Immunity Transplanta
[1 credit hour (1, 0, 0)]
The course will introduce fundamental knowledge of the immune system and its defense mechanisms and the nature and role of microbial pathogens in human and animal diseases.
Term Offered: Summer, Fall

MICB 5020 Medical Microbiology II
[5 credit hours (0, 0, 5)]
A series of lectures describing the classification, replication strategies and structural composition of the major families of animal viruses that infect humans.

MICB 6200 Microbiology Human Infections
[3 credit hours (0, 0, 3)]
A series of lectures describing the classification, replication strategies and structural composition of the major families of animal viruses that infect humans.

MICB 6210 Advanced Virology
[3 credit hours (0, 0, 3)]
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 6220 Laboratory Molecular Virology
[4 credit hours (0, 0, 0)]
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 (0, 0, 0)]
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 (3, 0, 3)]
A series of lectures describing the classification, replication strategies and structural composition of the major families of animal viruses that infect humans.

MICB 8210 Advanced Virology
[3 credit hours (0, 0, 3)]
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 Togaviridae 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 (0, 0, 0)]
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 (0, 0-15, 0)]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit
Term Offered: Spring, Summer, Fall
**MSBS in Medical Microbiology & Immunology**

The Medical Microbiology and Immunology (MMIM) (formerly Infection, Immunity and Transplantation) track participates in the masters in Biomedical Sciences 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 experience one or more rotations before selecting a major advisor and thesis laboratory. In addition to 40 credit hours in didactic and other courses, including a minimum of 10 credit hours of thesis research is required for degree. 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.

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<td>BMSP 8330</td>
<td>Curr Prob Res App Protein Str</td>
<td>2.5</td>
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<tr>
<td>BMSP 8340</td>
<td>Curr Prob Res App Genes/Genome</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8360</td>
<td>Curr Prob Cell Membranes</td>
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<td>BMSP 8380</td>
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<td>All MSBS students must pass MMIM ’100 Question Exam’ by June 30th of their 1st year.</td>
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1 Required.
2 Seventh, Eighth, and Ninth Terms if necessary.

The minimum number of credits required for MSBS is 40, with a minimum of 25 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.

**Ph.D in Biomedical Science - Medical Microbiology & Immunology**

The minimum number of credits required for PhD is 90, with a minimum of 25 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 Microbiology and Immunology Track. In the first year, students will take 14 credits the first term (Fall), 13 credits the second term (Spring), and 6 credits during summer term. During subsequent years while full-time, students will register for 9, 9, and 6 credits, respectively during fall, spring, and summer terms.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction to Biomedical Research</td>
<td></td>
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</tr>
<tr>
<td>Current Problems and Research Approaches (CPRA) in:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMSP 8330</td>
<td>Curr Prob Res App Protein Str</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8340</td>
<td>Curr Prob Res App Genes/Genome</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8360</td>
<td>Curr Prob Cell Membranes</td>
<td>3</td>
</tr>
<tr>
<td>BMSP 8380</td>
<td>Methods Biomedical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>INDI 8020</td>
<td>On Being a Scientist</td>
<td>1</td>
</tr>
<tr>
<td>BMSP 8390</td>
<td>Mentored Research</td>
<td>1-15</td>
</tr>
<tr>
<td><strong>Second Term</strong></td>
<td></td>
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</table>
**Second Term**

<table>
<thead>
<tr>
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<th>Hours</th>
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<tbody>
<tr>
<td>BMSP 8310</td>
<td>Systems Pathophysiology I</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8320</td>
<td>Systems Pathophysiology II</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8350</td>
<td>Cell Biology &amp; Signaling</td>
<td>3</td>
</tr>
<tr>
<td>BMSP 8390</td>
<td>Mentored Research</td>
<td>1-15</td>
</tr>
<tr>
<td>MMIM 8030</td>
<td>Current Topics in MMI</td>
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</table>

All students must pass MMIM '100 Question Exam' by June 30th of their 1st year.

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**Third Term**

<table>
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<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>BMSP 7320</td>
<td>Statistical Methods I</td>
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</tr>
<tr>
<td>MICB 8890</td>
<td>Independent Study Microbiology</td>
<td>15</td>
</tr>
<tr>
<td>BMSP 8390</td>
<td>Mentored Research</td>
<td>1-15</td>
</tr>
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</table>

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**Fourth Term**

<table>
<thead>
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<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>MMIM 8020</td>
<td>Advanced Immunology</td>
<td>1</td>
</tr>
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<td>Current Topics in MMI</td>
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</tr>
<tr>
<td>MMIM 8890</td>
<td>Independent Study in MMI</td>
<td>1-15</td>
</tr>
</tbody>
</table>

All PhD students must pass Qualifying Exam by the end of fall semester (December) of their 2nd year.

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**Fifth Term**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Electives</td>
<td></td>
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<tr>
<td>MMIM 8040</td>
<td>Advanced Microbiology</td>
<td>1</td>
</tr>
<tr>
<td>MMIM 8030</td>
<td>Current Topics in MMI</td>
<td>1</td>
</tr>
<tr>
<td>MMIM 9990</td>
<td>Dissertation Research MMI</td>
<td>1-15</td>
</tr>
</tbody>
</table>

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**Sixth Term**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MMIM 9990</td>
<td>Dissertation Research MMI</td>
<td>1-15</td>
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</tbody>
</table>

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**Seventh Term**

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<th>Hours</th>
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<td>MMIM 8030</td>
<td>Current Topics in MMI</td>
<td>1</td>
</tr>
<tr>
<td>MMIM 9990</td>
<td>Dissertation Research MMI</td>
<td>1-15</td>
</tr>
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</table>

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**Eighth Term**

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<tr>
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<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>MMIM 9990</td>
<td>Dissertation Research MMI</td>
<td>1-15</td>
</tr>
<tr>
<td>MMIM 8030</td>
<td>Current Topics in MMI</td>
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**Ninth Term**

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<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMIM 9990</td>
<td>Dissertation Research MMI</td>
<td>1-15</td>
</tr>
</tbody>
</table>

---

**Total Hours**

54-180

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1 Required.

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Third Year and Above: (Student Seminar/Current Topics in MMI required in fall and spring semesters)

---

**PhD Program Students: Year 4 and above**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMIM 8030</td>
<td>Current Topics in MMI</td>
<td>1</td>
</tr>
<tr>
<td>MMIM 9990</td>
<td>Dissertation Research MMI</td>
<td>1-15</td>
</tr>
</tbody>
</table>

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All PhD students must pass their Qualifying Exam by the end of the Fall semester (December) of the 2nd year. Prior to completing the exam, students should conduct dissertation research by registering for either Independent Study in Microbiology (graded; MICB 8890) or Independent Study in MMI (Satisfactory/Unsatisfactory; MMIM 8890). After passing the Qualifying Exam, students should conduct their research by registering for Dissertation Research (MMIM 9990).

---

All PhD students are required to register for Current Topics in MMI (MMIM 8030) 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 MMI.

---

**Ph.D in Biomedical Science - Molecular Medicine**

The Molecular Medicine (MOME) track (formerly Cardiovascular and Metabolic Diseases) track 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.
PhD Program Students: Year 1

The minimum number of credits required for PhD is 90, with a minimum of 25 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. In the first year, students will take 14 credits the first term (Fall), 13 credits the second term (Spring), and 6 credits during summer term. During subsequent years while full-time, students will register for 9, 9, and 6 credits, respectively during fall, spring, and summer terms.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Term</td>
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<tr>
<td>Introduction to Biomedical Research (^1)</td>
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</tr>
<tr>
<td>Current Problems and Research Approaches (CPRA) in:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMSP 8330                                      Curr Prob Res App Protein Str</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>BMSP 8340                                      Curr Prob Res App Genes/Genome</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>BMSP 8360                                      Curr Prob Cell Membranes</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BMSP 8380                                      Methods Biomedical Sciences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>INDI 8020                                      On Being a Scientist</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BMSP 8390                                      Mentored Research</td>
<td>1-15</td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td>13-27</td>
<td></td>
</tr>
<tr>
<td>Second Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMSP 8310                                      Systems Pathophysiology I</td>
<td>2.5</td>
<td></td>
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<tr>
<td>BMSP 8320                                      Systems Pathophysiology II</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>BMSP 8350                                      Cell Biology &amp; Signaling</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BMSP 8390                                      Mentored Research</td>
<td>1-15</td>
<td></td>
</tr>
<tr>
<td>MOME 8600                                      Journal Paper Review in Molecular Medicine</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td>10-24</td>
<td></td>
</tr>
<tr>
<td>Third Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMSP 7320                                      Statistical Methods I (required BMS core course)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MOME 8730                                      Research in Molecular Medicine</td>
<td>1-9</td>
<td></td>
</tr>
<tr>
<td>BMSP 8390                                      Mentored Research (if additional 5 week rotation is necessary)</td>
<td>1-15</td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td>5-27</td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td>28-78</td>
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</table>

\(^1\) Required.

PhD Program Students: Year 2 and Beyond

In addition to the BMS core requirements, PhD students in the Molecular Medicine track will be required to take the following courses to graduate:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOME 8300</td>
<td>Seminar in Molecular Medicine (required in fall and spring semesters of the 2nd, 3rd and 4th years)</td>
<td>1</td>
</tr>
<tr>
<td>MOME 8500</td>
<td>Advanced Topics in Molecular Medicine (fall)</td>
<td>3</td>
</tr>
<tr>
<td>MOME 8600</td>
<td>Journal Paper Review in Molecular Medicine (required in fall and spring semesters of the 2nd and 3rd years)</td>
<td>1</td>
</tr>
<tr>
<td>BMSP 8250</td>
<td>Grant Writing Workshop (spring)</td>
<td>2</td>
</tr>
<tr>
<td>MOME 8890</td>
<td>Independent Study in Molecular Medicine</td>
<td>1-9</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>0-4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5-13</td>
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</tbody>
</table>

Total Hours 7-27

Typical Course Schedules for Years 2-4

PhD Program Students: Year 2

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Fourth Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOME 8500</td>
<td>Advanced Topics in Molecular Medicine (fall)</td>
<td>3</td>
</tr>
<tr>
<td>MOME 8300</td>
<td>Seminar in Molecular Medicine (fall and spring)</td>
<td>1</td>
</tr>
<tr>
<td>MOME 8600</td>
<td>Journal Paper Review in Molecular Medicine (fall and spring)</td>
<td>1</td>
</tr>
<tr>
<td>MOME 8730</td>
<td>Research in Molecular Medicine</td>
<td>1-9</td>
</tr>
<tr>
<td>and/or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOME 8890</td>
<td>Independent Study in Molecular Medicine</td>
<td>1-9</td>
</tr>
<tr>
<td>and/or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>0-4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5-13</td>
</tr>
<tr>
<td>Fifth Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOME 8300</td>
<td>Seminar in Molecular Medicine (fall and spring)</td>
<td>1</td>
</tr>
<tr>
<td>MOME 8600</td>
<td>Journal Paper Review in Molecular Medicine (fall and spring)</td>
<td>1</td>
</tr>
<tr>
<td>BMSP 8250</td>
<td>Grant Writing Workshop (spring)</td>
<td>2</td>
</tr>
<tr>
<td>MOME 9990</td>
<td>Dissertation Research in Molecular Medicine</td>
<td>1-9</td>
</tr>
<tr>
<td>and/or</td>
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<td></td>
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<tr>
<td>Electives</td>
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<td>0-4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5-13</td>
</tr>
</tbody>
</table>
Sixth Term

MOME 9990  Dissertation Research in Molecular Medicine  1-9

and/or

Electives

Hours  1-9

Total Hours  13-49

Second Year Qualifying Examination (successful completion required in spring or summer semester)

PhD Program Students: Year 3

Course  Title

Seventh Term

MOME 8300  Seminar in Molecular Medicine (fall and spring)  1
MOME 8600  Journal Paper Review in Molecular Medicine (fall and spring)  1
MOME 9990  Dissertation Research in Molecular Medicine  1-9

Hours  3-11

Eighth Term

MOME 8300  Seminar in Molecular Medicine (fall and spring)  1
MOME 8600  Journal Paper Review in Molecular Medicine (fall and spring)  1
MOME 9990  Dissertation Research in Molecular Medicine  1-9

Hours  3-11

Ninth Term

MOME 9990  Dissertation Research in Molecular Medicine  1-9

Hours  1-9

Total Hours  7-31

PhD Program Students: Year 4 and Beyond

Course  Title

Fall, Spring and Summer

MOME 8300  Seminar in Molecular Medicine (fall and spring)  1
MOME 9990  Dissertation Research in Molecular Medicine  1-9
8 (fall and spring); 6 (summer)
9 (fall and spring); 6 (summer)

Total Hours  2-10

Department of Neurosciences

Robert McCullumsmith, M.D., Ph.D., chair
David Giovannucci, Ph.D., 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 four biomedical science degree programs in the University of Toledo, College of Medicine & Life Sciences, the Neurosciences 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 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,
- Otolaryngology,
- Psychiatry and
- Radiation Therapy.

Modern, state-of-the-art research laboratory and core facilities are available through the program and these participating departments.

The Neurosciences and Neurological Disorders training program at the University of Toledo on the Health Science Campus offers the PhD, or MD/PhD degrees through the interdisciplinary degree programs in Biomedical Sciences. The primary goal of the doctoral program in Neurosciences and Neurological Disorders is to train students for independent, creative careers in research and/or teaching. 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 four 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 or thesis research. A faculty committee is also jointly chosen by the student and advisor to supervise academic progress toward completion of the PhD or MSBS degree. PhD students are required to successfully pass a qualifying exam and to write and defend a research dissertation. Masters students complete a minimum of 40 credit hours and write and defend a research thesis.\textsuperscript{1}

\textsuperscript{1} MSBS in Neuroscience and Neurological Disorders is not currently offered.

Degrees Offered

- MS in Biomedical Science - Neuroscience & Neurological Disorders (p. 202)
- Ph.D in Biomedical Science - Neuroscience & Neurological Disorders (p. 203)
NNDP 5810 Neuroscience  
[5 credit hours (5, 5, 0)]  
A survey of medical neuroscience, taught as part of the medical school curriculum. It includes lectures, laboratories, and patient-presentation sessions.

NNDP 6010 Neurosciences Neurolog Disease  
[2 credit hours (2, 0, 0)]

NNDP 6500 Seminar in Neuroscience  
[1 credit hour (0, 0, 0)]  
Training and practice in presenting seminars on neuroscience research. May be repeated for credit.  
**Term Offered:** Spring

NNDP 6540 Jnl Paper Review Neuroscience  
[2 credit hours (0, 0, 0)]  
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 6560 Readings in Neuroscience  
[1-4 credit hours (0, 0, 0)]  
Tutorial course between major advisor and student to acquaint student with important writings relevant to neuroscience concepts. May be repeated for credit.  
**Term Offered:** Summer, Fall

NNDP 6720 Current Topics in Neuroscience  
[1-4 credit hours (0, 0, 0)]  
Tutorial course between major advisor and student to acquaint student with the range of topics of current major interest in neuroscience research. May be repeated for credit.  
**Term Offered:** Fall

NNDP 6730 Research in NNDP  
[1-15 credit hours (0, 0, 0)]

NNDP 6890 Indep Study in Neuroscience  
[1-12 credit hours (0, 0, 0)]  
Independent library and laboratory work under the supervision of the major advisor. May be repeated for credit.  
**Term Offered:** Summer, Fall

NNDP 6990 Thesis Research Neurosci Neuro  
[1-15 credit hours (0, 0, 0)]

NNDP 7810 Neuroscience  
[6 credit hours (6, 6, 0)]  
A survey of medical neuroscience, taught as part of the medical school curriculum. It includes lectures, laboratories, and patient-presentation sessions.  
**Term Offered:** Spring

NNDP 8010 Neurosci Neuro Diseases  
[2 credit hours (2, 0, 0)]  
The objectives of the course are to study nervous system development, organization and structure and of nervous system-related diseases.

NNDP 8500 Seminar in Neuroscience  
[1 credit hour (0, 0, 0)]  
Training and practice in presenting seminars on neuroscience research. May be repeated for credit.  
**Term Offered:** Spring

NNDP 8540 Jnl Paper Review Neuroscience  
[2 credit hours (0, 0, 0)]  
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 8560 Readings in Neuroscience  
[1-4 credit hours (0, 0, 0)]  
Tutorial course between major advisor and student to acquaint student with important writings relevant to neuroscience concepts. May be repeated for credit.  
**Term Offered:** Spring, Summer, Fall

NNDP 8720 Current Topics in Neuroscience  
[1-4 credit hours (0, 0, 0)]  
Tutorial course between major advisor and student to acquaint student with the range of topics of current major interest in neuroscience research. May be repeated for credit.  
**Term Offered:** Spring, Summer, Fall

NNDP 8890 Indep Study in Neuroscience  
[1-12 credit hours (0, 0, 0)]  
Independent library and laboratory work under the supervision of the major advisor. May be repeated for credit.  
**Term Offered:** Spring, Summer, Fall

NNDP 8990 Research in Neuroscience  
[1-15 credit hours (0, 0, 0)]  
Training in neuroscience research techniques through laboratory experience. May be repeated for credit.  
**Term Offered:** Spring, Summer, Fall

**MS in Biomedical Science - Neuroscience & Neurological Disorders**

MSBS in Neuroscience and Neurological Disorders is not currently offered

The NND track participates in the masters in biomedical sciences 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 experience one or more rotations before selecting a major advisor and thesis laboratory. In addition to 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.

In addition to 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.

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</tr>
<tr>
<td>BMSP 8380</td>
<td>Methods Biomedical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>INDI 8020</td>
<td>On Being a Scientist</td>
<td>1</td>
</tr>
<tr>
<td>BMSP 6390</td>
<td>Mentored Research (two 5 week lab rotations)</td>
<td>1-15</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>13-27</td>
</tr>
<tr>
<td><strong>Second Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMSP 8310</td>
<td>Systems Pathophysiology I</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8320</td>
<td>Systems Pathophysiology II</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8350</td>
<td>Cell Biology &amp; Signaling</td>
<td>3</td>
</tr>
<tr>
<td>BMSP 6390</td>
<td>Mentored Research (one additional rotation possible)</td>
<td>1-15</td>
</tr>
<tr>
<td>NNDP 6730</td>
<td>Research in NNDP</td>
<td>1-15</td>
</tr>
<tr>
<td>NNDP 8500</td>
<td>Seminar in Neuroscience</td>
<td>1</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>11-39</td>
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<tr>
<td><strong>Third Term</strong></td>
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<tr>
<td>BMSP 5320</td>
<td>Statistical Methods I (required BMS core course)</td>
<td>3</td>
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<tr>
<td>First Year Qualifying Examination (successful completion required in second or third term)</td>
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<tr>
<td>NNDP 6730</td>
<td>Research in NNDP</td>
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<tr>
<td><strong>Hours</strong></td>
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<td>Research in NNDP</td>
<td>1-15</td>
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<tr>
<td>NNDP 6990</td>
<td>Thesis Research Neurosci Neuro (and/or Electives)</td>
<td>1-15</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
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<td>2-30</td>
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<td><strong>Fifth Term</strong></td>
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<td>1-15</td>
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<tr>
<td>NNDP 6990</td>
<td>Thesis Research Neurosci Neuro</td>
<td>1-15</td>
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<tr>
<td>NNDP 8500</td>
<td>Seminar in Neuroscience (and/or Electives)</td>
<td>1</td>
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<tr>
<td><strong>Hours</strong></td>
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<td><strong>Sixth Term</strong></td>
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<tr>
<td><strong>Hours</strong></td>
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<td>1-15</td>
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<tr>
<td><strong>Seventh Term</strong></td>
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<td><strong>Hours</strong></td>
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<td><strong>Eighth Term</strong></td>
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<tr>
<td>NNDP 6990</td>
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</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>12</td>
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<table>
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<th>Title</th>
<th>Hours</th>
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<tr>
<td>NNDP 6990</td>
<td>Thesis Research Neurosci Neuro</td>
<td>9</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
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</tr>
<tr>
<td><strong>Total Hours</strong></td>
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<td>67-193</td>
</tr>
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</table>

1 Required.
2 Seventh, Eighth and Ninth Terms if necessary.

The minimum number of credits required for MSBS is 40, with a minimum of 25 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 NND track.

**Ph.D in Biomedical Science - Neuroscience & Neurological Disorders**

The minimum number of credits required for PhD is 90, with a minimum of 25 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction to Biomedical Research</td>
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</tr>
<tr>
<td>Current Problems and Research Approaches (CPRA) in:</td>
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<td>BMSP 8330</td>
<td>Curr Prob Res App Protein Str</td>
<td>2.5</td>
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<tr>
<td>BMSP 8340</td>
<td>Curr Prob Res App Genes/Genome</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8360</td>
<td>Curr Prob Cell Membranes</td>
<td>3</td>
</tr>
<tr>
<td>BMSP 8380</td>
<td>Methods Biomedical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>INDI 8020</td>
<td>On Being a Scientist</td>
<td>1</td>
</tr>
<tr>
<td>BMSP 8390</td>
<td>Mentored Research (two 5 week lab rotations)</td>
<td>1-15</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>13-27</td>
</tr>
<tr>
<td><strong>Second Term</strong></td>
<td></td>
<td></td>
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<tr>
<td>BMSP 8310</td>
<td>Systems Pathophysiology I</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8320</td>
<td>Systems Pathophysiology II</td>
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</tr>
<tr>
<td>BMSP 8350</td>
<td>Cell Biology &amp; Signaling</td>
<td>3</td>
</tr>
<tr>
<td>BMSP 8390</td>
<td>Mentored Research (one 5 week lab rotation)</td>
<td>1-15</td>
</tr>
<tr>
<td>NNDP 8500</td>
<td>Seminar in Neuroscience</td>
<td>1</td>
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<tr>
<td><strong>Hours</strong></td>
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<td><strong>Third Term</strong></td>
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<td>BMSP 7320</td>
<td>Statistical Methods I</td>
<td>3</td>
</tr>
<tr>
<td>NNDP 8990</td>
<td>Research in Neuroscience</td>
<td>1-15</td>
</tr>
<tr>
<td>BMSP 8390</td>
<td>Mentored Research (if additional 5 week rotation is necessary)</td>
<td>1-15</td>
</tr>
<tr>
<td>NNDP 8890</td>
<td>Independent Study in Neuroscience (optional)</td>
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<tr>
<td><strong>Hours</strong></td>
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<td>6-45</td>
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<td><strong>Fourth Term</strong></td>
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<tr>
<td>NNDP 8560</td>
<td>Readings in Neuroscience</td>
<td>1-4</td>
</tr>
<tr>
<td>NNDP 8720</td>
<td>Current Topics in Neuroscience</td>
<td>1-4</td>
</tr>
</tbody>
</table>
ORTH 5600 Phys Exam Musculoskeletal Sys
[1 credit hour (1, 1, 1)]
Students will be taught to do a complete physical exam of the musculoskeletal system and how to identify common clinical pathologies. A quick review of anatomy is helpful before taking this course. May be repeated for credit.
Term Offered: Summer, Fall
ORTH 5700 Orthopaedic X-Ray Conference
[2 credit hours (0, 2, 0)]
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 (3, 0, 3)]
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 (3, 0, 3)]
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 (3, 0, 3)]
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 (3, 0, 3)]
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, Summer, Fall

ORTH 6550 Jnl Rev Orthopaedic Science [1 credit hour (0, 0, 1)]
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 6730 Research in Orthopaedic Sci [0-4 credit hours (0, 0-4, 0)]
Students will participate in ongoing research programs of the members of the department faculty. Research could be clinical, theoretical, or experimental in nature. May be repeated for credit.
Term Offered: Spring, Fall

ORTH 6750 Biomaterials in Medicine [3 credit hours (3, 0, 0)]
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 (1, 0, 0)]
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 (0, 0, 0)]
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 6930 Orthopaedic Biomechanics [0-3 credit hours (0-3, 0-3, 0)]
Topics could range from fracture mechanics to study of different fixation devices or new prosthetic implant designs; may involve theoretical and/or experimental work. May be repeated for credit.
Term Offered: Spring, Fall

ORTH 6940 Adult Reconstruction & Tumor [1-3 credit hours (0, 1-3, 1-3)]
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 6950 Foot and Ankle [1-3 credit hours (1-3, 0, 1-3)]
ORTH 6950 is a clinical elective in Foot and Ankle Surgery. Students will gain familiarity with common problems associated with the foot and ankle and how they affect a person’s gait and function. Students will have the opportunity to observe surgical procedures including fracture care, fusions of the foot or ankle and correction of deformities of the toes. Students will spend 1 – 3 hours per week with a physician in this sub-specialty.
Term Offered: Spring

ORTH 6960 Upper Extremity and Hand [3 credit hours (0, 3, 0)]
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 (0, 0, 3-6)]
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 (3, 0, 0)]
Biomaterials use in wide variety range of applications in medicine including drug delivery carriers and replacement of tissues.
Term Offered: Spring

**MSBS in Orthopedic Sciences**

**Track Name: Bone Biology and Orthopedic Sciences**

The Department of Orthopedic Surgery offers graduate-level courses through the Master of Science in Biomedical Sciences program at the University of Toledo. This is a 2-year program consisting of classes, seminars, and research. The students work with:

- Dr. Martin Skie, Department of Orthopedic Surgery;  
- Beata Lecka-Czernik, Department of Orthopedic Surgery;  
- A. Champa Jayasuriya, Department of Orthopedic Surgery; and  
- Dr. Vijay Goel, Department of Bioengineering.

Our unique partnership with the Department of Bioengineering allows our researchers and physicians to have access to not only lab and research facilities, but also to the expertise of scientists in the biomechanics field.

Research in Orthopedic Sciences at the University of Toledo College of Medicine & Life Sciences covers a broad spectrum of topics including:

- Biomechanics  
- Biomineralization
• Bone diseases
• Bone tissue engineering and regenerative medicine
• Hand and foot disorders
• Hip and knee replacements
• Spinal injuries and disorders
• Sports medicine
• Stem cell technologies
• Trauma/fixation

Additional information may be found at http://www.utoledo.edu/med/depts/ortho/master_program/index.html.

Minimum number of credit hours for MSBS in Orthopedic Sciences degree completion is 69 for the 2-year program.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>First Term</td>
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<tr>
<td>BMSP 6330</td>
<td>Curr Prob Res App Protein Str</td>
<td>2.5</td>
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<tr>
<td>BMSP 6340</td>
<td>Curr Prob Res App Genes/Genom</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 6360</td>
<td>Curr Prob Cell Membranes</td>
<td>3</td>
</tr>
<tr>
<td>BMSP 6380</td>
<td>Methods Biomed Sciences</td>
<td>3</td>
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<tr>
<td>INDI 6020</td>
<td>On Being a Scientist</td>
<td>1</td>
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<tr>
<td>ORTH 6500</td>
<td>Orthopaedic Basic Science Sem</td>
<td>3</td>
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<tr>
<td></td>
<td>Hours</td>
<td>15</td>
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| Second Term |                                            |       |
| BMSM 6350   | Cell Biology & Signaling                   | 3     |
| ORTH 5800   | Ortho Bone Physiology                      | 3     |
| ORTH 6500   | Orthopaedic Basic Science Sem              | 3     |
| ORTH 6990   | Thesis Research or Scholarly Project for Medical Sciences | 0-10 |
| or INDI 6980|                                            |       |
|             | Hours                                      | 9-19  |

| Third Term  |                                            |       |
| ORTH 5700   | Orthopaedic X-Ray Conference               | 1     |
| BMSP 5320   | Statistical Methods I                      | 3     |
| ORTH 6550   | Jnl Rev Orthopaedic Science                | 1     |
| ORTH 6990   | Thesis Research or Scholarly Project for Medical Sciences | 0-10 |
| or INDI 6980|                                            |       |
|             | Hours                                      | 5-15  |

| Fourth Term |                                            |       |
| BIOE 5710   | Biomechanics of Soft and Hard Materials     | 3     |
| ORTH 5700   | Orthopaedic X-Ray Conference               | 1     |
| ORTH 6910   | Orthopaedic Trauma 1                       | 1-3   |
| ORTH 6920   | Orthopaedic Spine 1                        | 1-3   |
| ORTH 6930   | Orthopaedic Biomechanics 1                 | 1-3   |
| ORTH 6940   | Adult Reconstruction & Tumor 1             | 1-3   |
| ORTH 6950   | Foot and Ankle 1                           | 1-3   |
| ORTH 6960   | Upper Extremity and Hand 1                 | 1-3   |
| ORTH 6500   | Orthopaedic Basic Science Sem              | 3     |
| ORTH 6550   | Jnl Rev Orthopaedic Science                | 1     |

Minimum number of credit hours for MSBS in Orthopedic Sciences degree completion is 69 for the 2-year program.

Department of Pathology
Amira Gohara, M.D., Program Director

Degrees Offered
• Certificate in Pathology Fellowship (p. 208)
• MSBS Assistant in Pathology (p. 208)

PATH 6050 Clinical Neuropathology
[1 credit hour (1, 1, 0)]
Prerequisites: including utilization of virtual tissue slides.

**PATH 6060 Intro Surgical Path and Cytology**

[0-4 credit hours (0-4, 0-4)]

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 (0-4, 0-4)]

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 Intro Postmortem Pathology**

[0-4 credit hours (0-4, 0-4)]

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 (1, 1, 0)]

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 (1-4, 1-4, 0)]

Students will participate in ongoing research programs of the department faculty. May be repeated for credit.

**PATH 6780 Histology and Cell Physiology I**

[2 credit hours (2, 0, 0)]

The course is intended to introduce histologic techniques including tissue fixation, processing, staining, microtomy, 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

**PATH 6790 Histology and Cell Physiology II**

[2 credit hours (2, 0, 0)]

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

**PATH 6890 Independent Study in Pathology**

[0-12 credit hours (0-12, 0)]

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 (1, 1, 0)]

**PATH 7130 Pathology Case Studies**

[1-6 credit hours (0, 0, 1-6)]

Present, discuss and provide clinical pathologic correlation on various disease process. Interpret lab tests related to various diseases. Utilize laboratory testing to diagnose and manage various disease. Interact professionally with peers in the discussion of the cases.

**Term Offered:** Spring, Summer, Fall

**PATH 8050 Clinical Neuropathology**

[1 credit hour (1, 1, 0)]

**PATH 8060 Intro Surgical Path and Cytology**

[1-4 credit hours (1, 1, 0)]

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 (1, 1, 0)]

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 (1, 1, 0)]

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 (1, 1, 0)]
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 (1-4, 1-4, 0)]
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 (1, 1, 0)]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit.

Certificate in Pathology Fellowship
Pathology for Post-Second Year Medical Students Certificate
“Pre-Clinical Pathology Fellowship”

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
• perform phlebotomies on in- and out-patients

Electives and Scholarly Activities
• analyze scientific articles
• interpret EM specimens
• prepare and present scientific papers at annual scientific day

Teaching
• teach second year medical school labs

Students from LCME accredited medical schools who have completed their second 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.

Certificate in Pathology Fellowship
Pathology for Post-Second Year Medical Students Certificate
“Pre-Clinical Pathology Fellowship”

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 all organs from a given autopsy

Surgical Pathology
• perform gross and microscopic examinations on surgical specimens
• cut and stain frozen sections
• compile related medical history to the surgical specimens

Clinical Pathology
• interpret clinical data and correlate to surgical procedure
• provide clinicopathologic correlations for chemistry, microbiology, immunology tests
• evaluate images findings to the surgical specimens

Electives and Scholarly Activities
• analyze scientific articles
• prepare and present scientific papers at annual scientific day

MSBS Assistant in Pathology
Student Learning Objectives
At the end of the program, 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 all organs from a given autopsy

Surgical Pathology
• perform gross examinations and submit sections for surgical specimens
• cut and stain frozen sections
• compile related medical history to the surgical specimens

Clinical Pathology
• interpret clinical data and correlate to surgical procedure
• provide clinicopathologic correlations for chemistry, microbiology, immunology tests
• evaluate images findings to the surgical specimens

Electives and Scholarly Activities
• analyze scientific articles
• prepare and present scientific papers at annual scientific day

1. 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. GRE
3. $45 application fee
4. 3 letters of recommendation
5. Passing TOEFL (only international students)
6. One shadowing experience in autopsy and surgical pathology
7. meet all the requirements for College of Graduate

Prerequisites Courses:

The applicant should have successfully completed the following courses:

- general chemistry,
- organic chemistry or biochemistry,
- biology,
- microbiology,
- mathematics and
- English composition.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>First Term</td>
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<tr>
<td>ANAT 5000</td>
<td>Anatomy for Physician Assist</td>
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<td>PHSL 5050</td>
<td>Human Physiology</td>
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<tr>
<td>PATH 6060</td>
<td>Intro Surgical Path and Cytolo</td>
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<tr>
<td>PATH 6080</td>
<td>Intro Postmortem Pathology</td>
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</tr>
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<td>PHYA 6050</td>
<td>Ethics for PA Profession</td>
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<tr>
<td>PATH 6060</td>
<td>Intro Surgical Path and Cytolo (Ethics for PA Profession)</td>
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<tr>
<td>PATH 7130</td>
<td>Pathology Case Studies</td>
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<tr>
<td>PATH 6080</td>
<td>Intro Postmortem Pathology (Hospital + Forensics) Clinical</td>
<td>2</td>
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<td>Independent Study in Pathology</td>
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<td>PATH 6060</td>
<td>Intro Surgical Path and Cytolo (Clinical)</td>
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<td>Intro Postmortem Pathology</td>
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<td>PATH 7130</td>
<td>Pathology Case Studies</td>
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<td>PATH 7130</td>
<td>Pathology Case Studies</td>
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</table>

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.

Department of Physician Assistant Studies

Linda M. Speer, MD, FAAFP, Chair
April Gardner, MSBS, PA-C, Program Director

Masters Programs

Physician Assistants (PAs) are health care professionals, prepared and licensed 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 Physician Assistant 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 administration duties. The American Academy of Physician Assistants (AAPA) is the national organization that represents graduate PAs. The Student Academy of the American Academy of Physician Assistants (SAAAPA) serves the interests of PA students. The University of Toledo PA Program is a member of the Physician Assistant Education Association (PAEA), which is the national organization representing Physician Assistant education.

Accreditation

At its March 2017 meeting, the Accreditation Review Commission on Education for the Physician Assistant (ARC-PA) placed the University of Toledo Physician Assistant program sponsored by University of Toledo on Accreditation-Probation status until its next review in March 2019.

Probation is a temporary status of accreditation conferred when a program does not meet the Standards and when the capability of the program to provide an acceptable educational experience for its students is threatened.

Once placed on probation, programs that still fail to comply with accreditation requirements in a timely manner, as specified by the ARC-PA, may be scheduled for a focused site visit and/or risk having their accreditation withdrawn.

Specific questions regarding the Program and its plans should be directed to the Program Director and/or the appropriate institutional official(s).

Degrees Offered

- MSBS in Human Donation Science (PSM) (p. 213)
- MSBS in Physician Assistant Studies (p. 214)
HDSC 5010 Organ Transplant Procurement
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]

HDSC 5110 Fundamental Concepts and Clinical Practicum I
[3 credit hours (3, 0, 0)]
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 (0, 0, 0)]
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 (8, 0, 0)]
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 (6, 0, 0)]
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.
Corequisites: HDSC 5010, HDSC 5110
Term Offered: Spring, Summer, Fall

HDSC 5310 Clinical Aspects Procurement
[4 credit hours (4, 4, 0)]
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 (2, 0, 0)]
Selected topics that integrate learning and practice in human donation science.
Term Offered: Spring, Summer, Fall

PHYA 5010 Introduction to PA Profession
[1 credit hour (1, 0, 0)]
An overview of the history and philosophy of the physician assistant profession. Includes a review of current professional issues relevant to the PA profession.
Term Offered: Spring, Fall

PHYA 5100 Principle Interview/Medical History
[3 credit hours (3, 3, 3)]
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
[3 credit hours (3, 3, 0)]
Students will develop the knowledge and skills to competently perform a complete physical examination, 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 (2, 0, 0)]
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 (2, 2, 0)]
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
[1 credit hour (1, 1, 0)]
Introduction to the use and interpretation of commonly used diagnostic and therapeutic tools, including laboratory studies, radiographic studies, and electrocardiography.
Term Offered: Summer

PHYA 5230 Diagnostic and Therapeutic Skills III
[2 credit hours (2, 0, 0)]
Introduction to the use and interpretation of commonly used diagnostic and therapeutic tools, including laboratory studies, radiographic studies, and electrocardiography.
Term Offered: Fall

PHYA 5310 Clinical Medicine I
[4 credit hours (4, 0, 0)]
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 (6, 0, 0)]
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  
[3 credit hours (3, 0, 0)]  
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: Summer  
PHYA 5400 Pathophysiology I  
[2 credit hours (2, 0, 0)]  
An overview of physiological and pathologic processes that influence the human organism at the cellular, organ and systemic levels.  
Term Offered: Spring  
PHYA 5410 Pathophysiology II  
[2 credit hours (2, 0, 0)]  
An overview of physiological and pathologic processes that influence the human organism at the cellular, organ and systemic levels.  
Term Offered: Summer  
PHYA 5430 Pathophysiology III  
[1 credit hour (1, 0, 0)]  
An overview of physiological and pathologic processes that influence the human organism at the cellular, organ and systemic levels.  
Prerequisites: PHYA 5400 and PHYA 5410  
Term Offered: Fall  
PHYA 5510 Fundamentals of Pharmacology I  
[2 credit hours (2, 0, 0)]  
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  
[2 credit hours (2, 0, 0)]  
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  
[2 credit hours (2, 2, 0)]  
A study of the general principles of pharmacotherapeutics and the rational use of drugs for the diagnosis, prevention and treatment of diseases.  
Term Offered: Fall  
PHYA 6010 Basic Genetics  
[1 credit hour (1, 0, 1)]  
This course will provide an introduction to human genetics with an emphasis on medical aspects including common genetic disorders, cytogenetics, molecular genetics, cancer genetics, prenatal diagnosis, and genetic counseling.  
Term Offered: Summer  
PHYA 6040 Introduction to Clinical Radiology  
[1 credit hour (0, 0, 1)]  
Introducing the student to clinical medicine by providing the student with practical experience in radiology.  
Term Offered: Summer  
PHYA 6050 Ethics for PA Profession  
[2 credit hours (2, 0, 0)]  
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 Health Promo Disease Prevention  
[1 credit hour (1, 0, 0)]  
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 Principle of Research and Statistics  
[2 credit hours (2, 0, 0)]  
Presentation of methods of research and their application to clinical research in clinical practice. Present useful knowledge and understanding of the basic language, logic and methods of research design and statistical analysis.  
Term Offered: Fall  
PHYA 6150 Behavioral Science  
[2 credit hours (2, 0, 0)]  
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 I  
[2 credit hours (2, 0, 0)]  
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.  
Term Offered: Spring, Summer, Fall  
PHYA 6320 Clinical Rotation II  
[2 credit hours (2, 0, 0)]  
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.  
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)  
Term Offered: Spring, Summer, Fall
PHYA 6330 Clinical Rotation III
[2 credit hours (2, 0, 0)]
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)
Term Offered: Spring, Summer, Fall

PHYA 6340 Clinical Rotation IV
[2 credit hours (2, 0, 0)]
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)
Term Offered: Spring, Summer, Fall

PHYA 6350 Clinical Rotation V
[2 credit hours (2, 0, 0)]
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)
Term Offered: Spring, Summer, Fall

PHYA 6360 Clinical Rotation VI
[2 credit hours (2, 0, 0)]
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)
Term Offered: Spring, Summer, Fall

PHYA 6370 Clinical Rotation VII
[2 credit hours (2, 0, 0)]
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)
Term Offered: Spring, Summer, Fall

PHYA 6380 Clinical Rotation VIII
[2 credit hours (2, 0, 0)]
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)
Term Offered: Spring, Summer, Fall

PHYA 6410 Clinical Practice - ER
[1 credit hour (0, 0, 0)]
To provide the students with the opportunity to gain medical knowledge, develop proficiency and directed practical experience working directly with patients and health care personnel.
Term Offered: Spring, Summer, Fall

PHYA 6420 Clinical Practice - Family Medicine
[2 credit hours (0, 0, 0)]
To provide the students with the opportunity to gain medical knowledge, develop proficiency and directed practical experience working directly with patients and health care personnel.
Term Offered: Spring, Summer, Fall

PHYA 6430 Clinical Practice - Internal Medicine
[2 credit hours (0, 0, 0)]
To provide the students with the opportunity to gain medical knowledge, develop proficiency and directed practical experience working directly with patients and health care personnel.
Term Offered: Spring

PHYA 6440 Clinical Practice - Pediatrics
[2 credit hours (0, 0, 0)]
To provide the students with the opportunity to gain medical knowledge, develop proficiency and directed practical experience working directly with patients and health care personnel.
Term Offered: Spring, Fall

PHYA 6450 Clinical Practice - Surgery
[2 credit hours (0, 0, 0)]
To provide the students with the opportunity to gain medical knowledge, develop proficiency and directed practical experience working directly with patients and health care personnel.
Term Offered: Spring, Summer, Fall
PHYA 6500 Introduction to Clinical Practice
[1 credit hour (1, 0, 0)]
Students will review history taking and patient interview skills and patient evaluation skills. Clinical orientation will consist of clinical assignments and review of clinical manual. Students will acquire ACLS certification.
Term Offered: Spring

PHYA 6600 Research Practicum
[1 credit hour (0, 0, 0)]
Students will develop and implement a scholarly project under the supervision of the student’s major advisor.
Term Offered: Spring

PHYA 6610 Scholarly Project I
[1 credit hour (0, 0, 1)]
Students will develop and implement a scholarly project related to their professional goals. The project is negotiated between the student and the student's advisory committee.
Term Offered: Spring

PHYA 6620 Scholarly Project II
[1 credit hour (0, 0, 0)]

PHYA 6630 Scholarly Project III
[1 credit hour (0, 0, 0)]
Students will develop and implement a scholarly project related to their professional goals. The project is negotiated between the student and the student's advisory committee.
Term Offered: Spring, Summer, Fall

PHYA 6760 Clinical Preceptorship
[4 credit hours (0, 0, 4)]

PHYA 6890 PA Independent Study
[0-4 credit hours (0, 0, 0-4)]
The student and instructor will agree on a program of study that will enable the student to achieve his/her objectives. Requires approval of the Program Director. May be repeated for credit.
Term Offered: Spring, Summer, Fall

MSBS in Human Donation Science (PSM)
Linda Miller, RN, BSN, MPH, Interim Program Director

The Human Donation Science Master Degree (MSBS-HDS, PSM) program is designed to provide entry-level professional preparation for individuals who wish to become an organ procurement transplant coordinator. Organ procurement coordinators facilitate the organ donation process from beginning to end. They are the liaisons between the donor’s family, the coroner, the medical and nursing staff, the organ procurement organization and ultimately the transplant surgeon. 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 science coursework with business and management coursework further enables the HDS-MSBS, PSM graduate to step into the professional world of organ and tissue donation and transplantation.

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.
• Submission of online University of Toledo Graduate School Application.
• Three letters of recommendation (using the University of Toledo forms).
• 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.
• Satisfactory completion of a course in medical terminology or pass a medical terminology proficiency examination. Candidates who are unable to pass the medical terminology proficiency examination will be required to participate in a self-study program and pass a re-test.
• The Graduate Record Examination (GRE) and TOEFL are only required for international students.
• Interview, if requested.
• Graduate School application fee.

Although not required, shadowing an organ procurement coordinator is highly recommended.

Persons who are currently practicing professionals in the field of donation and transplantation are also eligible to enroll in 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 on-campus track.

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<tr>
<td>First Term</td>
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<td>HDSC 5010</td>
<td>Organ Transplant Procurement</td>
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<td>Scientific &amp; Clinical Foundations for Human Organ &amp; Tissue Donation &amp; Transportation</td>
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<td>Human Donation Sci Internship</td>
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<td>HDSC 5410</td>
<td>Human Donation Science Seminar</td>
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Total Hours 40

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The University of Toledo (UT) Physician Assistant Program is a graduate entry-level professional 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 health care. 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 admits students each Fall Semester only.

To be considered for the Physician Assistant Program, candidates must comply with all of the following:

The completion of all admission requirements to the central application service or CASPA (https://portal.caspaonline.org/) by OCTOBER 1. CASPA will be available once the next cycle of application opens.

CASPA submissions must include:

- Completed and signed application form
- Application fee
- Three letters of recommendation
- Transcripts for all colleges/universities attended
- In addition, candidates must complete the supplementary application online and pay the associated application fee.

Applicants to the University of Toledo PA Program must be citizens or permanent residents of the United States. Applicants who have completed any of their previous undergraduate or graduate training internationally must fulfill the requirements of the University of Toledo, College of Graduate Studies for international students, available on the College of Graduate Studies website at www.utoledo.edu/graduate. The University of Toledo PA Program requires applicants to provide foreign transcript evaluation from one of the accepted credential evaluation agencies: ECE or WES. The evaluation will be at the applicant’s expense. In addition to the requirement for regular admission, all students from non-English speaking countries must achieve satisfactory scores on the Test of English as a Foreign Language (TOEFL) (unless the international applicant has graduated from a US accredited college or university). All international applicants must also demonstrate that they have adequate financial resources for their graduate education before they can be admitted. The TOEFL score requirements and a copy of the financial statement form are available for viewing at the College of Graduate Studies website at www.utoledo.edu/graduate.

The following Minimum Prerequisites must be completed with a grade of B- (3.0) or better:

1. Human Anatomy (Lab recommended)
2. Human Physiology (Lab recommended)
3. Inorganic/General Chemistry with Lab
4. Organic Chemistry/Biochemistry with Lab
5. Microbiology with Lab
6. Introductory Psychology, or upper-level Psychology
7. Additional Psychology Course (Lifespan Psychology recommended)
8. College Algebra, or higher mathematics
9. Medical Terminology (minimum 1 credit hour or pass a medical terminology test)

Notes about Admission Requirements

Each prerequisite course above must consist of at least three (3) SEMESTER credit hours. All coursework identified above must be current within eight (8) years of admission to the program. The deadline for finishing prerequisite coursework for the class entering in August is June 15th. These are minimum program requirements. All prerequisites must be completed with a grade of B- or better. For courses where separate grades are assigned for lecture and laboratory sections, the candidate must receive a grade of B- or better for BOTH lecture and lab. For applicants enrolled at institutions that use a QUARTER system, credit hours are converted such that five (5) quarter hours = three (3) semester hours. There are many factors involved in the holistic selection process, including but not limited to:

- cumulative undergraduate (or completed graduate) grade point average,
- cumulative science grade point average,
- personal experiences,
- writing sample,
- reference letters,
- familiarity with the PA profession and the University,
- problem solving and
- teamwork.

An applicant must complete the general admission requirements specified above. Circumstances which may result in a provisional admission include: An applicant with a Bachelor’s degree in progress (must be completed by June 15th). An official transcript with the degree posted must be received prior to matriculation into the program.

An applicant who has any prerequisite courses to complete at the time of application may be admitted with provisional status, with a clear understanding that remaining prerequisites must be satisfactorily (grade of B- or better) completed prior to June 15th for matriculation into the program.
Program. Official transcripts or other appropriate documentation will be required.

In addition to the above minimum requirements, preference will be given to applicants that have earned a B- or better in any of the following advanced healthcare and science-related undergraduate or graduate courses, including but not limited to:

- immunology,
- physics,
- pathophysiology,
- pharmacology,
- endocrinology,
- neuroanatomy,
- neurobiology or
- higher level chemistry courses.

A candidate with less than a 3.40 undergraduate GPA may be considered for admission with regular student status only if he/she has completed at least 10 semester hours (15 quarter hours) of applicable coursework at the graduate level and has a minimum GPA of 3.40 in these courses.

Formal healthcare experience, shadowing of PAs or other healthcare providers or patient contact hours are not required. The program does not expect a "required" number of shadowing hours.

Prior to matriculation, candidates must present evidence that they are currently trained in basic cardiopulmonary resuscitation (CPR) according to American Heart Association standards. This training must be maintained throughout the program of study.

Candidates must demonstrate proof of prior Medical Terminology Course with a grade of B- or better or pass a proficiency exam administered prior to matriculation.

Preference will be given to current Ohio residents, graduates of The University of Toledo, non-traditional and diverse applicants and those with significant health care experience.

The University of Toledo PA Program does not provide advanced placement or advanced standing for any students.

Selection Process

Candidates for interviews will be selected from those with completed applications (both CASPA and the University of Toledo PA Supplemental Application Form) who meet the minimum entrance requirements. Interviews typically occur in January and continue through March. The selection process is highly competitive and merely meeting minimum entrance requirements does not guarantee an interview or admission to the program. Formal patient contact experience is not a requirement for entrance. There are many factors involved in the selection process, including but not limited to:

- cumulative undergraduate (or completed graduate) grade point average,
- cumulative science grade point average,
- personal experiences,
- writing sample,
- reference letters,
- familiarity with the PA profession and the University,
- problem solving and
- teamwork.

Based upon a point scoring system with holistic consideration of each candidate, the Admissions Committee may recommend one of the following:

Acceptance: The review of the candidates' scores that are based upon the candidate's completed CASPA application and interviews will be recommended to the University of Toledo, College of Graduate Studies for acceptance. The number of candidates recommended for acceptance will be determined by the PA Program class size of 20 students. Following interviews, candidates are informed of acceptance beginning in April.

Wait List: All interviewed candidates who were not offered admission will be placed on the wait list. Candidates not admitted from the wait list must reapply if they wish to be considered for the following year. Candidates are informed of wait list status in May or June after all seats have been offered and accepted.

Admission Criteria for "Provisional" Status

An applicant must complete the general admission requirements specified above. Circumstances which may result in a provisional admission include:

- An applicant with a Bachelor's degree in progress (must be completed by June 15th). An official transcript with the degree posted must be received prior to matriculation into the program.
- An applicant with an undergraduate cumulative grade point average (GPA) less than 3.0 may be admitted with provisional status. Students must achieve a 3.0 in graduate study at University of Toledo by the completion of 15 semester hours or may be subject to dismissal. In the past, candidates with undergraduate GPAs less than 3.0 have not been competitive unless they have demonstrated academic achievement through the completion of a relevant graduate level degree program.
- An applicant who has any prerequisite courses to complete at the time of application may be admitted with provisional status, with a clear understanding that remaining prerequisites must be satisfactorily (grade of B- (3.0) or better) completed prior by June 15th for matriculation into the Program. Official transcripts or other appropriate documentation will be required.
- Candidates who are unable to pass the medical terminology proficiency examination will be required to participate in a self-study program and retest or satisfactorily complete a medical terminology course at an accredited college or university prior to matriculation in Fall courses.

Technical Standards for Admission

Our objective is to increase the opportunities for persons with disabilities, while maintaining the expectation that all students achieve the goals of the Program. The technical standards for admission establish the expectations and abilities considered essential for students admitted to the Physician Assistant Program in order to achieve the level of competency required for graduation and ultimately practice as a
Physician Assistant Program students:

- must have the mental capacity to assimilate and learn a large amount of complex, technical and detailed information, to solve clinical problems, and synthesize and apply concepts and information from various disciplines in order to formulate diagnostic and therapeutic plans;
- must have the ability to maintain composure and emotional stability during periods of high stress;
- must have the ability to communicate effectively and sensitively with patients from different social and cultural backgrounds and develop effective professional rapport with patients and co-workers;
- must have the ability to record examination and diagnostic results clearly, accurately and efficiently;
- must have adequate sensory function to fulfill minimum competency objectives for palpation, percussion and auscultation necessary to perform a physical examination;
- must possess sufficient postural control, neuromuscular control and eye-to-hand coordination to use standard medical/surgical instruments and possess sufficient control of the upper extremities to meet the physical requirements for training and for performing a safe physical examination;
- are expected to learn and perform common diagnostic and therapeutic procedures (e.g., phlebotomy, suturing) and interpret the results;
- are expected to have a degree of coordination of motor skills necessary to respond to emergency situations quickly and appropriately.

Candidates are urged 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. Questions may be directed to the Program Director or Office of Student Services. 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. Information about disabilities is handled in a confidential manner. Reasonable accommodations will be made to comply with the Americans with Disabilities Act. These require program and institutional approval. Requests for accommodations must be submitted in writing, allowing sufficient time prior to matriculation for action on these requests pursuant to Policy 01061, Nondiscrimination on the Basis of Disability.

**Other Requirements**

Individuals selected for admission to the program must undergo a general physical examination and provide evidence of up-to-date immunization prior to the start of classes in the first year and again just prior to the beginning of clinical rotations in the second year. In addition, students are required to maintain health insurance and liability insurance coverage. Further information is contained in the College of Graduate Studies Handbook and will be reviewed in detail at orientation.

To remain in good academic standing in the Physician Assistant Program, a student must be able to demonstrate the possession of:

1. a current cumulative graduate GPA of at least 3.0
2. satisfactory grades, successful completion of each clinical rotation and completion of all Program requirements.

Failure to achieve each criterion listed above shall be adequate grounds for the Program Director to recommend probation or dismissal from the Program for academic deficiencies.

No D or F grades will be permitted in any courses.

Clinical Practice consists of a total eight (4 week) rotations, with one in each of the following specialties:

- emergency medicine,
- internal medicine,
- family medicine,
- behavioral,
- women’s health,
- surgery,
- pediatrics, and
- an elective (which may be any specialty of medicine).

The clinical preceptorship consists of an 8 week rotation in family medicine or general internal medicine.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ANAT 5000</td>
<td>Anatomy for Physician Assistant</td>
<td>5</td>
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<tr>
<td>PHSL 5050</td>
<td>Human Physiology</td>
<td>3</td>
</tr>
<tr>
<td>PHYA 5010</td>
<td>Introduction to PA Profession</td>
<td>1</td>
</tr>
<tr>
<td>PHYA 5100</td>
<td>Principle Interview/Medical History</td>
<td>3</td>
</tr>
<tr>
<td>PHYA 5140</td>
<td>Health Care Teams and Systems</td>
<td>2</td>
</tr>
<tr>
<td>PHYA 5130</td>
<td>Patient Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>PHYA 5210</td>
<td>Diagnostic and Therapeutic Skills I</td>
<td>2</td>
</tr>
<tr>
<td>PHYA 5310</td>
<td>Clinical Medicine I</td>
<td>4</td>
</tr>
<tr>
<td>PHYA 5400</td>
<td>Pathophysiology I</td>
<td>2</td>
</tr>
<tr>
<td>PHYA 5510</td>
<td>Fundamentals of Pharmacology I</td>
<td>2</td>
</tr>
<tr>
<td>PHYA 6050</td>
<td>Ethics for PA Profession</td>
<td>2</td>
</tr>
<tr>
<td>PHYA 5220</td>
<td>Diagnostic and Therapeutic Skills II</td>
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<td>PHYA 5340</td>
<td>Clinical Medicine II</td>
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<tr>
<td>PHYA 5410</td>
<td>Pathophysiology II</td>
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</tr>
<tr>
<td>PHYA 5520</td>
<td>Fundamentals of Pharmacology II</td>
<td>2</td>
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<tr>
<td>PHYA 6010</td>
<td>Basic Genetics</td>
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<tr>
<td>PHYA 6040</td>
<td>Introduction to Clinical Radiology</td>
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<tr>
<td>PHYA 6110</td>
<td>Health Promo Disease Prevention</td>
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<tr>
<td>PHYA 5230</td>
<td>Diagnostic and Therapeutic Skills III</td>
<td>2</td>
</tr>
<tr>
<td>PHYA 5330</td>
<td>Clinical Medicine III</td>
<td>6</td>
</tr>
</tbody>
</table>
The revised program is pending review.

**Department of Physiology & Pharmacology**

_Bina Joe, Ph.D., chair_

_Andrew Beavis, Ph.D., track director_

**Degrees Offered**

- MSBS in Molecular Medicine (p. 218)

**BMSP 5320 Statistical Methods I**

[3 credit hours (3, 0, 0)]

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 6250 Grant Writing Workshop**

[2 credit hours (2, 0, 0)]

This is an interdisciplinary course designed to teach students skills in developing a research plan in the form of a grant proposal.

*Term Offered:* Spring

**BMSP 6310 Systems Pathophysiology I**

[2.5 credit hours (2, 0, 0)]

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 6320 Systems Pathophysiology II**

[2.5 credit hours (0, 0, 0)]

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 6330 Curr Prob Res App Protein Str**

[2.5 credit hours (2, 0, 0)]

The course will cover principles of protein structure/function relationships in proteins, protein folding, ligand-protein interactions and mechanism of enzyme-catalyzed reactions. Special emphasis will be given to the present-day research.

*Term Offered:* Fall

**BMSP 6340 Curr Prob Res App Genes/Genom**

[2.5 credit hours (2, 0, 0)]

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 (3, 0, 0)]

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 Curr Prob Cell Membranes**

[3 credit hours (3, 0, 0)]

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 (1, 0, 0)]

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 Biomed Sciences**

[3 credit hours (3, 0, 0)]

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 (1-15, 1-15, 0)]

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 (1, 0, 0)]  
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 7320 Statistical Methods I  
[3 credit hours (3, 0, 0)]  
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 8250 Grant Writing Workshop  
[2 credit hours (2, 0, 0)]  
This is an interdisciplinary course designed to teach students skills in developing a research plan in the form of a grant proposal.  
Term Offered: Spring

BMSP 8310 Systems Pathophysiology I  
[2.5 credit hours (0, 0, 0)]  
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 8320 Systems Pathophysiology II  
[2.5 credit hours (0, 0, 0)]  
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 (2.5, 0, 0)]  
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  
[2.5 credit hours (2.5, 0, 0)]  
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 (3, 0, 0)]  
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  
[3 credit hours (3, 0, 0)]  
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  
[3 credit hours (3, 0, 0)]  
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 (1-15, 1-15, 0)]  
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

MSBS in Molecular Medicine

The minimum number of credits required for MSBS is 40, with a minimum of 25 credits of didactic coursework (letter grade).

The MSBS curriculum includes advanced electives in Molecular Medicine or other areas to make up the 25 required didactic credit hours.

A minimum of 10 credits of Thesis Research is required for graduation.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Introduction to Biomedical Research</td>
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<tr>
<td>Current Problems and Research Approaches (CPRA) in:</td>
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</tr>
<tr>
<td>BMSP 8330 Curr Prob Res App Protein Str</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8340 Curr Prob Res App Genes/Genome</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8360 Curr Prob Cell Membranes</td>
<td>3</td>
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<tr>
<td>BMSP 8380 Methods Biomedical Sciences</td>
<td>3</td>
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<tr>
<td>INDI 8020 On Being a Scientist</td>
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</tr>
<tr>
<td>BMSP 6390 Mentored Research (one or if necessary two 5 week lab rotations)</td>
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<td>Hours</td>
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<thead>
<tr>
<th>Course Title</th>
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<tbody>
<tr>
<td>MOME 8600 Journal Paper Review in Molecular Medicine</td>
<td>1</td>
</tr>
<tr>
<td>BMSP 8310 Systems Pathophysiology I</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 8350 Cell Biology &amp; Signaling</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
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<tr>
<td>MOME 6730 Research in Molecular Medicine</td>
<td>1-9</td>
</tr>
<tr>
<td>Hours</td>
<td>7.5-15.5</td>
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<table>
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<tr>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BMSP 5320 Statistical Methods I (required BMS core course)</td>
<td>3</td>
</tr>
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</table>
MOME 6730 Research in Molecular Medicine 1-9

The MSBS First Year Qualifying Examination (successful completion required in third term) is taken at the end of the first year

<table>
<thead>
<tr>
<th>Term</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Fourth Term</td>
<td>4-12</td>
</tr>
<tr>
<td>MOME 6300 Seminars in Molecular Medicine</td>
<td>1</td>
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<tr>
<td>MOME 6600 Journal Paper Review in Molecular Medicine</td>
<td>1</td>
</tr>
<tr>
<td>MOME 6990 Thesis Research in Molecular Medicine (and/or Electives)</td>
<td>1-9</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Term</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fifth Term</td>
<td>3-11</td>
</tr>
<tr>
<td>BMSP 8310 Systems Pathophysiology I (if not taken in year 1)</td>
<td>2.5</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>BMSP 8350 Cell Biology &amp; Signaling (if not take in year 1)</td>
<td>3</td>
</tr>
<tr>
<td>MOME 6300 Seminars in Molecular Medicine (required for students in their 2nd year)</td>
<td>1</td>
</tr>
<tr>
<td>MOME 6600 Journal Paper Review in Molecular Medicine (required for students in their 2nd year)</td>
<td>1</td>
</tr>
<tr>
<td>MOME 6990 Thesis Research in Molecular Medicine (and/or Electives)</td>
<td>1-9</td>
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<tr>
<th>Term</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Sixth Term</td>
<td>8.5-16.5</td>
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<td>MOME 6990 Thesis Research in Molecular Medicine (and/or Electives)</td>
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<tr>
<th>Term</th>
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</thead>
<tbody>
<tr>
<td>Seventh Term</td>
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<tr>
<td>MOME 6990 Thesis Research in Molecular Medicine (and/or Electives)</td>
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<tr>
<th>Term</th>
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</thead>
<tbody>
<tr>
<td>Eighth Term</td>
<td>1-9</td>
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<tr>
<td>MOME 6990 Thesis Research in Molecular Medicine (and/or Electives)</td>
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</tbody>
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<table>
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<tr>
<th>Term</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Ninth Term</td>
<td>1-9</td>
</tr>
<tr>
<td>MOME 6990 Thesis Research in Molecular Medicine (and/or Electives)</td>
<td>1-9</td>
</tr>
</tbody>
</table>

| Total Hours   | 40-118 |

1 Required.
2 Seventh, Eighth, and Ninth Terms if necessary. Fall/Spring Semester (9 credits each), Summer (6 credits)

Department of Radiology and Department of Radiation Oncology

Degree Programs

- MSBS Medical Physics (Diagnostic Imaging Track)
- MSBS Medical Physics (Radiation Oncology Track)
- (Also PhD in Physics and Astronomy with specialization in medical physics in both tracks is offered through the College of Natural Sciences & Mathematics.)

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

- Medical Physics Programs (p. 223)

MPHY 6010 Survey of Diagnostic Medical Imaging I
[3 credit hours (3, 0, 0)]
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 basics of Nuclear Medicine will be covered. The course builds upon basic reviews 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 (0, 0, 3)]
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 (0-5, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0-4)]
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 (2, 0, 0)]
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: Fall

MPHY 6120 Radiation Dosimetry I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 6140 Radiation Biology
[3 credit hours (3, 3, 0)]
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 6150 Physics of Radiation Therapy
[3 credit hours (3, 0, 0)]
Basic radiation physics and physical aspects of treatment planning, using photon and electron beams as well as brachytherapy sources will be taught.
Term Offered: Spring, Fall

MPHY 6190 Brachytherapy
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 3)]
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 Radiation Therapy
[2 credit hours (0, 0, 0)]
Computer fundamentals and problem solving through programming. Typical problems include PDD, TAR, TMR, MU calculations, scatter summation, TMR for arc and dose distributions.

MPHY 6280 Electronics for Med Physicists
[2 credit hours (0, 0, 0)]
Basics of electronics circuit design to perform specific tasks as it relates to medical physics applications.

MPHY 6300 Radiation Detection/Measuremen
[3 credit hours (3, 3, 0)]
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 (4, 0, 0)]
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 Rad
[2 credit hours (2, 2, 0)]
Basic practical considerations in measurements of photon and electron beam parameters of the linear accelerator.
Term Offered: Summer

MPHY 6400 Intro to LINAC in Radiation Th
[3 credit hours (0, 0, 0)]
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 (1, 0, 0)]
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 Measurement
[3 credit hours (0, 0, 0)]
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 Clinical Training in Radiation Physics I
[4 credit hours (0, 0, 0)]
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, IGRT, 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 Clinical Training in Radiation Physics II
[4 credit hours (0, 0, 0)]
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 tune 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 Clinical Training in Radiation Physics III
[5 credit hours (0, 0, 0)]
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
[4-0 credit hours (0-4, 0)]
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: Medical Physics
[0-12 credit hours (0-12, 0, 0)]
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 (0-12, 0, 0)]
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: Radiation Therapy
[0-12 credit hours (0-12, 0-12, 0)]
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 6970 Scholarly Project
[3 credit hours (0, 0, 0)]
Develop an in-depth scholarly project in radiation therapy to fulfill the requirements for the MSBS degree. May be repeated for credit.

MPHY 8010 Survey of Diagnostic Medical Imaging I
[3 credit hours (0, 0, 0)]
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 (0, 0, 3)]
This course builds on the material taught in MPHY 6010/8010, and discusses advanced concepts in medical imaging including functional MRI, SPECT, and PET imaging. Details of radioactivity & nuclear transformation, radionuclide production & radiopharmaceuticals, 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 Diagnostic Radiological Physics
[0-5 credit hours (0-5, 0, 0)]
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 (3, 0, 0)]
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 of Clinical Radiology
[2 credit hours (2, 0, 0)]
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: Fall
MPHY 8120 Radiation Dosimetry I
[3 credit hours (3, 0, 0)]
Series of lectures covering basic concepts of 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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Basic radiation physics and physical aspects of treatment planning, using photon and electron beams as well as brachytherapy sources will be taught.
Term Offered: Spring, Fall

MPHY 8190 Brachytherapy
[3 credit hours (0, 0, 0)]
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 Radiation Protect and Regulation
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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 (0, 0, 0)]
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 (0, 0, 0)]
Basics of electronics circuit design to perform specific tasks as it relates to medical physics applications.

MPHY 8300 Radiation Detection/Measuremen
[3 credit hours (3, 0, 0)]
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 (4, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0)]
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 Tmg Radi Oncol Physcs II
[4 credit hours (0, 0, 0)]
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 tune their techniques in Treatment Planning, QA Issues, daily clinical responsibilities and operations as a medical physicist are taught.
Term Offered: Spring

MPHY 8630 Clin Tmg Radi Oncol Physc III
[5 credit hours (0, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0-15)]
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

Medical Physics Programs

Programs of study leading to the 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, a specific course of study is offered in radiation oncology physics or in diagnostic imaging. This course of study includes didactic courses, independent study, and hands-on clinical 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 capability of 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. 231) 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, digital scanner for chromic film dosimetry system, RIT densitometry package, etc.

The Medical Physics program is housed on the Health Science Campus and the University of Toledo Medical Center (UTMC) where much of the medical physics training is accomplished at the newly built 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. There also exists a large Cs-137 irradiator is also available on campus for blood, small animal, or other cellular petri-dish irradiation.

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 chronic film dosimetry
• RIIT 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.

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 10 credits in Thesis Research (INDI699).

The MSBS degree in Medical Physics typically involves 55 credit hours over a 22 months period.

Medical physics core courses include:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MPHY 6310</td>
<td>Anatomy/Physiology</td>
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<tr>
<td>IND 6020</td>
<td>On Being a Scientist</td>
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<tr>
<td>MPHY 6010</td>
<td>Survey of Diagnostic Medical Imaging I</td>
<td>3</td>
</tr>
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<td>MPHY 6120</td>
<td>Radiation Dosimetry I</td>
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</tr>
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<td>MPHY 6160</td>
<td>Radiation Biology</td>
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</tr>
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<td>MPHY 6300</td>
<td>Radiation Detection/Measuremen</td>
<td>3</td>
</tr>
<tr>
<td>MPHY 6200</td>
<td>Radiation Protect and Regulation</td>
<td>3</td>
</tr>
<tr>
<td>MPHY 6110</td>
<td>Survey Clinical Radi Therapy</td>
<td>2</td>
</tr>
<tr>
<td>MPHY 6500</td>
<td>Medical Physics Seminar</td>
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</tr>
<tr>
<td>IND 6990</td>
<td>Thesis Research</td>
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</table>

Typical course curriculum in Medical Physics - Radiation Oncology track include:

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>MPHY 6130</td>
<td>Radiation Dosimetry II</td>
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<tr>
<td>MPHY 6180</td>
<td>Physics of Radiation Therapy</td>
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<tr>
<td>MPHY 6190</td>
<td>Brachytherapy</td>
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<tr>
<td>MPHY 6320</td>
<td>Practical Measurements in Rad</td>
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</tbody>
</table>

Typical course curriculum in Medical Physics - Diagnostic Imaging track include:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPHY 6020</td>
<td>Survey of Diagnostic Medical Imaging II</td>
<td></td>
</tr>
<tr>
<td>MPHY 6060</td>
<td>Nuclear Medicine</td>
<td></td>
</tr>
<tr>
<td>MPHY 6860</td>
<td>Independent Study in Radiology (CT and MRI)</td>
<td></td>
</tr>
</tbody>
</table>

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.

Division of Dentistry

Michael Nedley, D.D.S., chair

Degrees Offered
• MSBS in Oral Biology (p. 225)
DENT 6010 Growth and Development
[0.5 credit hours (0.5, 0, 0)]
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 (0.5, 0, 0)]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, expected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Fall

DENT 6030 Dento-alveolar Trama I
[0.5 credit hours (0.5, 0, 0)]
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 6040 Conscious Sedation I
[2 credit hours (2, 0, 0)]
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, Fall

DENT 6050 Clinical Pediatric Dentistry
[0.5-1 credit hours (0.5-1, 0, 0)]
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 (2, 0, 0)]
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 (0.5, 0, 0)]
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 (1, 0, 0)]
Lecture and discussion of select topics in gross anatomy and embryology.
Term Offered: Spring

DENT 6090 Concepts - Dental Microbiology
[0.5 credit hours (0.5, 0, 0)]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, expected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Spring, Summer, Fall

DENT 6100 Pediatric Medicine Lecture
[2 credit hours (2, 0, 0)]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, expected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Spring, Summer, Fall

DENT 6110 Oral Health Policies
[2 credit hours (2, 0, 0)]

DENT 6120 Pharmacology II
[0.5 credit hours (0.5, 0, 0)]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, expected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Spring

DENT 6130 Dento-alveolar Trama II
[0.5 credit hours (0.5, 0, 0)]

DENT 6140 Conscious Sedation
[2 credit hours (2, 0, 0)]
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

DENT 6150 Amer Board of Pediatric Dent RE
[0.5 credit hours (0.5, 0, 0)]

DENT 6160 Special Care Dentistry
[1-10 credit hours (0, 0, 1-10)]
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 6170 Clinical Pediatric Dent Clinic
[1-10 credit hours (0, 0, 1-10)]
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 6180 Pediatric Medicine Lecture
[1 credit hour (1, 0, 0)]
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

MSBS in Oral Biology
The oral biology program is restricted to Pediatric 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 specific to each Dental Resident and students should consult with their advisor to create their specific Plan of Study.

<table>
<thead>
<tr>
<th>Course Title</th>
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<tbody>
<tr>
<td>DENT 6040 Consious Sedation I</td>
<td>2</td>
</tr>
</tbody>
</table>
### Graduate Degrees/Certificates Offered

#### Graduate Degrees Offered

**Doctor of Philosophy in Biomedical Science**
- Cancer Biology (Department of Biochemistry & Cancer Biology)
- Molecular Medicine (Previously Cardiovascular and Metabolic Disease) (Department of Physiology & Pharmacology)
- Medical Microbiology and Immunology (Previously Infection, Immunity, and Transplantation) (Department of Medical Microbiology & Immunology)
- Neurosciences and Neurological Disorders (Department of Neurosciences)

**Doctor of Philosophy in Biomedical Engineering**
See College of Engineering (p. 89) catalog.

**Master of Science in Biomedical Sciences**
- Assistant in Pathology
- Bioinformatics and Proteomics/Genomics
- Biomarkers and Diagnostics (Professional Science Masters)
- Molecular Medicine
- Medical Microbiology and Immunology
- Human Donation Sciences (Professional Science Masters)
- Medical Physics
- Medical Sciences
- Oral Biology
- Orthopedic Sciences
- Physician Assistant Studies

#### Dual Degrees
- Doctor of Medicine and Doctor of Philosophy in Biomedical Sciences
  - Please go to this link for more information: [http://www.utoledo.edu/med/mdphd/pdf/2016%20UT%20MDPhD%20Handbook.pdf](http://www.utoledo.edu/med/mdphd/pdf/2016%20UT%20MDPhD%20Handbook.pdf)
- Doctor of Medicine and Master of Science in Biomedical Sciences
- Doctor of Medicine and Master of Public Health

1 Students must be accepted into the MD program first to be eligible for the dual degree (contact the College of Health Sciences for additional information about Master of Public Health requirements).

Additional Dual Degrees available in MD/JD (contact Medical School Admissions) and MD/MBA (Refer to the College of Business and Innovation (p. 52) catalog for additional information).

#### Graduate Certificates
- Certificate in Biomarkers and Bioinformatics
- Certificate in Pathology for Post Second Year Medical Students

### UNDERGRADUATE CERTIFICATE

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Hours</th>
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<tbody>
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<td>DENT 6060</td>
<td>Principles of Behav/Comm Mgmt</td>
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<td>DENT 6070</td>
<td>Pediatric Dentistry Literature</td>
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<td>DENT 6050</td>
<td>Clinical Pediatric Dentistry</td>
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<td></td>
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<td><strong>Second Term</strong></td>
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<td>DENT 6010</td>
<td>Growth and Development</td>
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<td>DENT 6020</td>
<td>Pharmacology I</td>
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<td>Dento-alveolar Trama I</td>
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<td>Clinical Pediatric Dentistry</td>
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<td>DENT 6070</td>
<td>Pediatric Dentistry Literature</td>
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<tr>
<td>INDI 6980</td>
<td>Scholarly Project for Medical Sciences</td>
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<td>(1-10 credits)</td>
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<td>PUBH 6000</td>
<td>Biostatistics</td>
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<td>Anatomy &amp; Embryology Head/Neck</td>
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<td>DENT 6090</td>
<td>Concepts - Dental Microbiology</td>
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<td>DENT 6120</td>
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<td>Conscious Sedation</td>
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</tr>
<tr>
<td>INDI 6980</td>
<td>Scholarly Project for Medical Sciences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1-10 hours)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td><strong>Fourth Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DENT 6100</td>
<td>Pediatric Medicine Lecture</td>
<td>2</td>
</tr>
<tr>
<td>DENT 6110</td>
<td>Oral Health Policies</td>
<td>2</td>
</tr>
<tr>
<td>INDI 6980</td>
<td>Scholarly Project for Medical Sciences</td>
<td></td>
</tr>
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<td></td>
<td>(1-10 hours)</td>
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<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>4</strong></td>
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<tr>
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</tr>
<tr>
<td>DENT 6100</td>
<td>Pediatric Medicine Lecture</td>
<td>2</td>
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<tr>
<td>DENT 6110</td>
<td>Oral Health Policies</td>
<td>2</td>
</tr>
<tr>
<td>DENT 6150</td>
<td>Amer Board of Pediatric Dent RE</td>
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<td>DENT 6160</td>
<td>Special Care Dentistry</td>
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<td>INDI 6980</td>
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<tr>
<td></td>
<td>(1-10 hours)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
<td><strong>7</strong></td>
</tr>
<tr>
<td><strong>Sixth Term</strong></td>
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<td></td>
</tr>
<tr>
<td>DENT 6100</td>
<td>Pediatric Medicine Lecture</td>
<td>2</td>
</tr>
<tr>
<td>DENT 6200</td>
<td>Oral Pathology</td>
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<td>INDI 6020</td>
<td>On Being a Scientist</td>
<td>1</td>
</tr>
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<td>Scholarly Project for Medical Sciences</td>
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</tr>
<tr>
<td></td>
<td>(1-10 hours)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Hours</strong></td>
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</tr>
<tr>
<td><strong>Total Hours</strong></td>
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<td><strong>32</strong></td>
</tr>
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</table>
PhD and Masters Programs

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) 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. In addition, Graduate Record Examination (GRE) scores are required in most programs of study (see individual degree programs for specific requirements). Minimum scores of the 50th percentile or above for both Verbal and Quantitative scores and 4.0 (Analytical Writing Test) are recommended to be competitive for most degree programs. 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 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 prior Masters degree is not required to enter the PhD program. 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 and a research stipend funded in whole or in part by the College of Graduate Studies and funding from a student’s advisor through a grant(s). There are a limited number of tuition scholarships and stipends available for students in the Masters in Biomedical Sciences programs.

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 a 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 at the following link, and return to the Graduate School for processing: https://www.utoledo.edu/graduate/files/Request_to_add_a_grad_certific.pdf
2. Submit a letter of support from major advisor. This can be an email that simply indicates that the thesis advisor is aware, and approves, of the student’s participation in the Certificate Program.

Applicants who are NOT UT graduate students:

1. Complete online application. https://apply.utoledo.edu
2. Submit Official transcripts
3. Earned bachelors or graduate degree and GRE score
4. Statement of Purpose
5. Two letters of recommendation are required, three letters are optional. In the event that a student decides to pursue the BIPG MSBS degree, it will save time to have the 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 University of Toledo credit hours being allowed to count towards both degrees. Students (University of Toledo biology majors) typically apply at the end of their second year, but can apply as incoming first-year students. For more information, go to the Pipeline Program website: http://www.utoledo.edu/med/depts/bioinfo/pages/pipeline%20ut.html.

Students enrolled in the BRIM Certificate Program take four courses covering the following subject areas:

1. Introduction to the scope of bioinformatics, proteomics and genomics: "Fundamentals of BPG"
2. Training in statistical methods used in biomarker research and bioinformatics: “Statistical Methods in Bioinformatics”
3. Handling and manipulation of databases and introduction to computer programming skills needed to analyze large quantities of nucleic acid and protein sequence data: “Introduction to Bioinformatic Computation”
4. Either "Applications of BPG", in which faculty members using these methods will discuss and demonstrate how these techniques are utilized to solve research problems, OR "Biomarker Discovery, Validation and Implementation", in which 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 four, 3-credit courses, for a total of 12 credits (listed below) that can be taken over 1-4 years: (BPG – Bioinformatics and Proteomics/Genomics). The following shows the one-year completion schedule.

(BPG - Bioinformatics and Proteomics/Genomics)
MSBS Biomarkers and Diagnostics (PSM)

The Professional Science Master in Biomarkers and Diagnostics (MSBS-PBD) is designed to be a terminal degree with the graduate having strong prospects for immediate employment in industry. The MSBS-PBD degree is a “job ready” degree. This is achieved by a three-pronged approach:

- To prepare master’s students with a strong foundation in the fundamentals of biomarker discovery and development through focused course work.
- To complement their science education through course work in management, orienting them to realities of the business aspects of the pharmaceutical/diagnostics industry.
- To place them as interns in a pharmaceutical- or diagnostic-oriented company for four months to enhance their practical training and employability.

The MSBS-PSMBD program is targeted to students completing a bachelor in computer science, chemistry or a biological or pharmaceutical science.

(CPRA = Current Problems & Research Approaches)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIPG 5100/7100</td>
<td>Fund Bioinformatics Proteomics</td>
<td>3</td>
</tr>
<tr>
<td>BIPG 5200/7200</td>
<td>Statistical Meth Bioinformatic</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Second Term</td>
<td>Bioinformatic Computation</td>
<td>3</td>
</tr>
<tr>
<td>BIPG 6100/8100</td>
<td>Applications of Bioinformatics or Biomarker Disc, Valid &amp; Impleme</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>BMSP 6340 or equivalent course approved by the BRIM/BPG Program, is required for admission into the Bioinformatics &amp; Biomarkers Certificate Program.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOTE: The 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 BRIM/BPG 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.</td>
<td></td>
</tr>
</tbody>
</table>

MSBS in Bioinformatics & Proteomics-Genomics

Robert Blumenthal, Ph.D., director

The Bioinformatics and Proteomics/Genomics (BPG) Programs are designed to provide training in the rapidly-developing interface between computer science and life sciences. Graduates with such training are in high demand, (in part due to the explosion in genome sequence analysis), whether the BPG studies are for an independent degree or for one of the several dual-degree programs. In addition, students in other programs may take BPG courses as electives.

Masters, Certificate and Dual Degree Programs

The program in Bioinformatics and Proteomics/Genomics, along with the Ohio Center of Excellence for Biomarker Research and Individualized Medicine at the University of Toledo, offers a Certificate that can be earned either alone or in association with the degrees of Doctor of Philosophy (PhD) or Doctor of Medicine (MD). The Certificate program is designed to fit smoothly into the doctoral programs with minimal extra time required. BPG also offers a Master of Science in Biomedical Sciences (MSBS) degree. MSBS students follow a well-defined curriculum that includes core courses, journal club, seminars, independent research, and electives in their area of interest. Both Certificate and MSBS students are trained in the theory, methods and applications of bioinformatics, proteomics, genomics, and biomarker research.

Bioinformatics programs generally place more emphasis on either computer science or the biomedical aspects of the field. The University of Toledo’s program falls into the latter category. However, there are courses in PERL, Java, and SQL programming (for example), and
the Program provides biomedical researchers with a solid introduction to the computational aspects, or computer science experts with a rigorous introduction to the biomedical aspects of bioinformatics.

To be admitted to the Masters in Biomedical Sciences Program with Regular status, applicants must hold an earned baccalaureate (or equivalent) from an accredited college or university. Students with a GPA below 3.0, but at or above 2.5, may apply for provisional acceptance that would change to regular (non-probationary) status if their first term graduate coursework has a GPA of 3.0 or above. Typically, applicants will have an undergraduate major in Biology or a related discipline such as Biochemistry or Biophysics. Students with other majors are encouraged to apply; however, their coursework should include several semesters in biology. The GRE is not required for US students with GPA above 3.0, UT or Findlay students entering the bachelors-masters pipeline program, or students with a recent MCAT score of 25 or higher. The GRE is required for all other applicants. For international applicants, the TOEFL IBT (>80) or IELTS (>6.5) is also required. For all applicants, laboratory research or computer programming experience is considered, but not required.

(CPRA = Current Problems & Research Approaches)  
(BIPG = Bioinformatics & Proteomics/Genomics)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tr>
<td><strong>First Term</strong></td>
<td></td>
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</tr>
<tr>
<td>BMSP 6340</td>
<td>Curr Prob Res App Genes/Genom (8 weeks)</td>
<td>2.5</td>
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<tr>
<td>BIPG 5200</td>
<td>Statistical Meth Bioinformatic (16 weeks)</td>
<td>3</td>
</tr>
<tr>
<td>BIPG 5100</td>
<td>Fund Bioinformatics Proteomics (16 weeks)</td>
<td>3</td>
</tr>
<tr>
<td>INDI 6020</td>
<td>On Being a Scientist (12 weeks)</td>
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<tr>
<td>BMSP 6390</td>
<td>Mentored Research (8 weeks; 2x4 wk lab rotations)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>11.5</td>
</tr>
<tr>
<td><strong>Second Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIPG 6100</td>
<td>Bioinformatic Computation (16 weeks)</td>
<td>3</td>
</tr>
<tr>
<td>BIPG 6400 or BRIM 6200</td>
<td>Applications of Bioinformatics (16 weeks)</td>
<td>3</td>
</tr>
<tr>
<td>BMSP 6350</td>
<td>Cell Biology &amp; Signaling (16 weeks)</td>
<td>3</td>
</tr>
<tr>
<td>BIPG 6990</td>
<td>Thesis in Bioinformatics (16 weeks)</td>
<td>1</td>
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<tr>
<td></td>
<td>Hours</td>
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<tr>
<td><strong>Third Term</strong></td>
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<tr>
<td>BIPG 5400</td>
<td>Biodatabases (4 weeks)</td>
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<tr>
<td>BIPG 5500</td>
<td>Microarray Analysis (4 weeks)</td>
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<td>BIPG 6990</td>
<td>Thesis in Bioinformatics</td>
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</tr>
<tr>
<td></td>
<td>Hours</td>
<td>3-17</td>
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<td><strong>Fourth Term</strong></td>
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<tr>
<td>Elective 1 (16 weeks; see approved list)</td>
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<td>BIPG 5300</td>
<td>Current Topics in BPG (16 weeks)</td>
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<td>Thesis in Bioinformatics</td>
<td>1-15</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>5-19</td>
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<td><strong>Fifth Term</strong></td>
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<tr>
<td>Elective 2 (see approved list)</td>
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<tr>
<td>BIPG 5300</td>
<td>Current Topics in BPG</td>
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<th>Title</th>
<th>Hours</th>
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<tr>
<td>BIPG 6990</td>
<td>Thesis in Bioinformatics</td>
<td>1-15</td>
</tr>
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<td></td>
<td>Hours</td>
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**Sixth Year**

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<tr>
<td>BIPG 6990</td>
<td>Thesis in Bioinformatics</td>
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|                                 | Hours                                      | 1-6   |

**Total Hours**

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<td>Third Term</td>
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<td>Fourth Term</td>
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<td>Total</td>
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</table>

1. CPRA = Current Problems & Research Approaches.
2. Students must register for a specific Bwk/2cr section of BMSP 6390 Mentored Research. As a prerequisite, students must attend an introductory series of short research presentations. These presentations are associated with another course for which BIPG students do not register, but are expected to attend for the first 8 weeks.
3. In this and other terms, with permission of advisory committee, student may take Scholarly Project in BPG (BIPG 5900) in place of Thesis in Bioinformatics.
4. Journal paper review and presentation.

The minimum number of credits required for MSBS is 44.5, with a minimum of 20.5 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.

**MSBS in Medical Science**

Nitin Puri, M.D., Ph.D., Program Director

The primary goal of this program is to educate and train graduate students who have completed all prerequisites required for medical school but wish to enhance their understanding of the biological sciences and improve their academic credentials for applying to medical school.

The 2016-2017 academic year represents a complete redesign of the former MSBS-MS program with renewed emphasis on the core-teachings of pathophysiology of disease. The program has been conceived with three primary objectives:

1. Provide clinically relevant, medical and graduate-level education to students who wish to boost their academic standing, towards a long-term goal of pursuing a career in medicine.
2. Create a strong foundation for improved performance in any MD/DO-curriculum, and USMLE step 1 and step 2 exams.
3. Provide basic and clinical research opportunities to broaden student perspective and strengthen their overall portfolio.

This advanced-foundational graduate program provides a unique opportunity for the graduate students to train along-side medical students (11 credits, multiple modules) and gain meaningful clinical and/or basic science research experience. Students will have the opportunity to complete coursework with medical students (and graded using the same scale), participate in other graduate college courses, as well as the opportunity to work with an advisor to design, perform and present a scholarly project. This curriculum will provide foundational information for continued study in the medical school curriculum.

Students completing this program with strong academic performance, as indicated by high GPAs, will have confirmed their ability to perform

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University of Toledo
in the medical school curriculum, and therefore greatly strengthen their overall admission package. Students in good academic standing in the program are guaranteed an interview for medical school at the University of Toledo, College of Medicine & Life Sciences. Students who successfully complete the program will also be awarded the Master of Science in Biomedical Sciences degree (MSBS). Completion of this degree is a requirement, but not a guarantee of admission into the Doctor of Medicine (MD) degree program at the University of Toledo College of Medicine & Life Sciences. If you have previously applied to the MD degree program at the University of Toledo College of Medicine & Life Sciences, and wish to re-apply after completing the MSBS-MS program, you will need to submit a new application to the medical school.

- Applicant must be a U.S. Citizen or Permanent Resident
- Baccalaureate degree from an accredited college or university
- All prerequisites required for medical school must be completed prior to admission into the MSBS-MS program
  - Official MCAT score (28/500 or higher is recommended)
  - Official undergraduate transcripts confirming degree submitted directly to the College of Graduate Studies
- GPA of 3.0 or greater is recommended
- One letters of recommendation
  - Committee recommendation letters are accepted with all signatures
  - Recommendation letters must include your full name
- Personal statement
  - Personal Statements submitted from medical school admission are accepted. A new career goals personal statement is required for MSBS-MS admission.
  - Personal Statements must include your full name
- University of Toledo College of Graduate Studies online application
  - Application Fee submitted at the time of online application
  - Please note: If you have already applied to the University of Toledo Medical School you must submit written authorization to the College of Graduate Studies in order for your medical school file to be accessed. Please do not make this request until you have submitted your application and fee.

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Term</strong></td>
<td>First Term Hours</td>
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</tr>
<tr>
<td>IND1 5200</td>
<td>Cellular and Molecular Biology</td>
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</tr>
<tr>
<td>IND1 5550</td>
<td>Anatomy and Pathophysiology</td>
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</tr>
<tr>
<td>PUBH 6000</td>
<td>Biostatistics</td>
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</tr>
<tr>
<td>IND1 6980</td>
<td>Scholarly Project for Medical Sciences</td>
<td></td>
</tr>
<tr>
<td><strong>Second Term</strong></td>
<td>Second Term Hours</td>
<td>11</td>
</tr>
<tr>
<td>IND1 6980</td>
<td>Scholarly Project for Medical Sciences</td>
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</tr>
<tr>
<td>IND1 5350</td>
<td>Pathophysiology of Organ Systems</td>
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<tr>
<td><strong>Third Term</strong></td>
<td>Third Term Hours</td>
<td>8</td>
</tr>
<tr>
<td>IND1 6020</td>
<td>On Being a Scientist</td>
<td></td>
</tr>
</tbody>
</table>

Program total minimum of credits for MSBS degree in Medical Science is 37 credits.
College Policies (Graduate Handbook)


COGS Graduate Student Handbook (http://www.utoledo.edu/graduate/files/Graduate%20Student%20Handbook%202015-2016.pdf)
  - College Policies and Procedures (p. 392)
  - Academic Regulations (p. 394)
  - Other Policies and Information (p. 399)

Departments

  - Department of Biological Sciences (p. 231)
  - Department of Chemistry and Biochemistry (p. 234)
  - Department of Environmental Sciences (p. 241)
  - Department of Mathematics and Statistics (p. 246)
  - Department of Physics and Astronomy (p. 257)

Department of Biological Sciences

Bruce Bamber, chair
Deborah Chadee, associate chair
Tomer Avidor-Reiss, graduate adviser

The department of biological sciences offers graduate degrees at master's and doctoral levels. Students entering the M.S. or Ph.D. programs are expected to have an adequate background in natural sciences and in mathematics. Usually, this will require knowledge of differential and integral calculus, college physics, organic and general chemistry, and biology. Students may be admitted on a provisional basis if they do not have an adequate academic background, but they will be expected to acquire it as rapidly as possible.

Degrees Offered

  - MS in Biology (p. 233)
  - MSE in Biology (p. 234)
  - PhD in Biology (p. 234)

BIOI 5030 Advanced Microbiology
[3 credit hours (3, 0, 0)]
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

BIOI 5040 Advanced Microbiology Laboratory
[1 credit hour (0, 3, 0)]
Laboratories utilizing basic microbiological techniques and illustrating principles of growth, identification and genetics of microbes.
Corequisites: BIOL 5030
Term Offered: Spring
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Term Offered</th>
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<tr>
<td>BIOL 5050</td>
<td>Advanced Immunology</td>
<td>[3]</td>
<td>Fall</td>
</tr>
<tr>
<td>BIOL 5060</td>
<td>Advanced Immunology Laboratory</td>
<td>[1]</td>
<td>Fall</td>
</tr>
<tr>
<td>BIOL 5230</td>
<td>Advanced Comparative Animal Physiology</td>
<td>[3]</td>
<td>Fall</td>
</tr>
<tr>
<td>BIOL 5980</td>
<td>Advanced Topics In The Biological Sciences For Science Educators</td>
<td>[1-3]</td>
<td>Summer, Fall</td>
</tr>
<tr>
<td>BIOL 6000</td>
<td>Introduction To Scientific Thought And Expression</td>
<td>[3]</td>
<td>Fall</td>
</tr>
<tr>
<td>BIOL 6010</td>
<td>Advanced Molecular Biology</td>
<td>[4]</td>
<td>Fall, Spring</td>
</tr>
<tr>
<td>BIOL 6020</td>
<td>Advanced Molecular Biology Laboratory</td>
<td>[2]</td>
<td>Summer</td>
</tr>
<tr>
<td>BIOL 6090</td>
<td>Advanced Cell Biology</td>
<td>[4]</td>
<td>Spring, Summer</td>
</tr>
<tr>
<td>BIOL 6200</td>
<td>Advanced Signal Transduction</td>
<td>[3]</td>
<td>Spring</td>
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<td>BIOL 6260</td>
<td>Topics in Cancer Biology</td>
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<td>Fall</td>
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<tr>
<td>BIOL 6830</td>
<td>Molecular and Cellular Biology</td>
<td>[4]</td>
<td>Fall</td>
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<tr>
<td>BIOL 6920</td>
<td>Special Projects In Biology</td>
<td>[2-4]</td>
<td>Spring, Summer, Fall</td>
</tr>
<tr>
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<td>Seminar In Biology</td>
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<td>Fall</td>
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<tr>
<td>BIOL 6960</td>
<td>Masters Thesis Research</td>
<td>[1-15]</td>
<td>Spring, Summer, Fall</td>
</tr>
<tr>
<td>BIOL 6980</td>
<td>Advanced Topics In Biology</td>
<td>[2-4]</td>
<td>Spring</td>
</tr>
<tr>
<td>BIOL 6990</td>
<td>Advanced Readings In Biology</td>
<td>[2-4]</td>
<td>Spring, Summer, Fall</td>
</tr>
<tr>
<td>BIOL 7030</td>
<td>Advanced Microbiology</td>
<td>[3]</td>
<td>Spring</td>
</tr>
</tbody>
</table>

The development, genetics and physiology of the immune response.

Lectures on the comparative and environmental physiology of vertebrates and invertebrates including metabolism, temperature regulation, respiration, circulation excretion and osmotic regulation.

A writing intensive course for new graduate students that focuses on scientific hypothesis testing and reading the original literature in biology.

Analysis of recent developments in prokaryotic and eukaryotic molecular biology through evaluation and discussion of current literature.

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.

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.

The course will cover our current understanding of carcinogenesis and provide in-depth discussion of the important topics and latest advances in cancer research.

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.

Introduction to research on a selected problem under the direction of an individual faculty member.

Presentation on research or current literature by graduate students, faculty, or guest speakers.

Research that normally contributes to the fulfillment of the M.S. thesis requirement.

Seminar/discussion of significant current topics or problems in biology.

Faculty directed readings or projects in a specific area of Biology.

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.
BIOL 7040 Advanced Microbiology Laboratory
[1 credit hour (0, 3, 0)]
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 (3, 0, 0)]
The development, genetics and physiology of the immune response.
Corequisites: BIOL 7030
Term Offered: Spring, Fall

BIOL 7060 Advanced Immunology Laboratory
[1 credit hour (0, 3, 0)]
Laboratory studies of the immune response.
Corequisites: BIOL 7050
Term Offered: Fall

BIOL 8000 Introduction To Scientific Thought And Expression
[3 credit hours (3, 0, 0)]
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
[4 credit hours (4, 0, 0)]
Analysis of recent developments in prokaryotic and eukaryotic molecular biology through evaluation and discussion of current literature.
Term Offered: Fall

BIOL 8090 Advanced Cell Biology
[4 credit hours (4, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring

BIOL 8260 Topics in Cancer Biology
[3 credit hours (3, 0, 0)]
The course will cover our current understanding of carcinogenesis and provide in-depth discussion of the important topics and latest advances in cancer research.
Prerequisites: BIOL 8010 and BIOL 8090 and CHEM 8500
Term Offered: Fall

BIOL 8920 Special Projects In Biology
[2-4 credit hours (0, 0, 0-4)]
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 (0, 0, 1)]
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 (0, 0, 0-15)]
Research normally leading to the fulfillment of the Ph.D. dissertation requirement.
Term Offered: Spring, Summer, Fall

BIOL 8980 Advanced Topics In Biology
[2-4 credit hours (0-4, 0, 0)]
Seminar/discussion of significant current topics or problems in biology.
Term Offered: Spring

MS in Biology
Cell/Molecular Biology Concentration

Option A (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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 6000</td>
<td>Introduction To Scientific Thought And Expression</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 6010</td>
<td>Advanced Molecular Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 6090</td>
<td>Advanced Cell Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 6100</td>
<td>Research Methodology: Cell And Molecular Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 6200</td>
<td>Advanced Signal Transduction</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 6930</td>
<td>Seminar In Biology (take twice)</td>
<td>1</td>
</tr>
</tbody>
</table>

Select additional course and research credits 12
Total Hours 30

In some cases, a written comprehensive examination may be required at the end of the first year for students with deficiencies in their coursework. The student must take a minimum of 6 hours of BIOL 6960, write an original research thesis, and pass an oral examination on the thesis.

Option B (Non-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:
A maximum of three hours in BIOL 6960, BIOL 6980 or BIOL 6990 may be included in the minimum 30 hours. The student must write an original research paper based on library research that meets the approval of the student's advisory committee and pass an oral examination defending the research hypothesis. Normally, students choosing Option B will not be encouraged to pursue graduate study beyond the M.S. degree.

Up to 10 hours of graduate credit may be transferred from another accredited institution, as recommended by the student's advisory committee.

MSE in Biology

For the degree of master of science and education, students must meet requirements for the degree as stated in the Judith Herb College of Education (p. 299) graduate section of this catalog. In addition, no more than 8 hours may be earned in 5000-level courses. Students doing their theses in biology rather than in education must fulfill the same thesis-related requirements as other biology M.S. candidates.

PhD in Biology

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.

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 semester 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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 6010</td>
<td>Advanced Molecular Biology</td>
<td>4</td>
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<td>BIOL 6090</td>
<td>Advanced Cell Biology</td>
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<td>BIOL 6100</td>
<td>Research Methodology: Cell And Molecular Biology</td>
<td>3</td>
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<tr>
<td>BIOL 6930</td>
<td>Seminar In Biology (take twice)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Select additional course and research credits</td>
<td></td>
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<tr>
<td></td>
<td>Total Hours</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>30</td>
</tr>
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</table>

Courses numbered at the 5000 and 6000 levels are intended primarily for students at the master's level. Courses numbered at the 7000 and 8000 levels are intended primarily for students at the post-master's (students with a master's degree, or with more than 34 graduate credit hours) and doctoral levels. Courses carrying a dual listing (numbered at both 5000/7000 or 6000/8000 levels) are available to students at both levels. In these cases, there may be substantive differences in the course requirements for students registered at the advanced level.

The department considers experience in teaching to be a vital and significant component of graduate education. Therefore, all graduate students in the Ph.D. program are required to complete at least one semester of formal teaching experience. M.S. students also are expected to acquire teaching experience as part of their graduate programs.

Department of Chemistry and Biochemistry

Jon R. Kirchhoff, chair
Cora Lind-Kovacs, associate chair
Don R. Ronning, director of graduate studies

Degrees Offered

• MS in Chemistry (p. 239)
• MSE in Chemistry (p. 241)
• PhD in Chemistry (p. 241)

CHEM 5100 Principles of Organic and Inorganic Chemistry [4 credit hours (4, 0, 0)]
Study of coordination compounds with a focus on ligand bonding, electron counting, molecular orbital theory, reactivity, and catalysis. In addition, polymerization, structure-property relationships, and commercial materials will be explored. A review of undergraduate-level general and organic chemistry topics with discussions concerning teaching these subjects is also included.

Term Offered: Summer
CHEM 5160 Chemistry Laboratory Techniques Development  
[2 credit hours (0, 2, 0)]  
Study of general and organic chemistry laboratory techniques, such as the characterization, structural determination and reactions of organic and inorganic compounds, with an emphasis on pedagogical aspects of the techniques. Approved chemical safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting.  
Term Offered: Summer

CHEM 5170 Chemistry Instrumentation Techniques  
[2 credit hours (0, 2, 0)]  
The study of advanced instrumentation techniques and structural determination of organic and inorganic compounds with an emphasis on pedagogical aspects of the techniques. Approved chemical safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting.  
Prerequisites: CHEM 5160

CHEM 5230 Chemistry of Sustainable Materials  
[4 credit hours (0, 0, 4)]  
Applications of the principles of chemistry to understand the issues related to a sustainable energy future.

CHEM 5300 Principles Of Analytical Chemistry  
[1-4 credit hours (0, 0, 0-1)]  
Tutorial in selected topics in analytical chemistry. S/U grading only.  
Term Offered: Fall

CHEM 5400 Principles Of Organic Chemistry  
[1-4 credit hours (0, 0, 0-1)]  
Tutorial in selected topics in organic chemistry. S/U grading only.  
Term Offered: Summer, Fall

CHEM 5500 Principles Of Biological Chemistry  
[1-4 credit hours (0, 0, 0-1)]  
Tutorial in selected topics in biological chemistry. S/U grading only.  
Term Offered: Fall

CHEM 5600 Principles Of Inorganic And Organometallic Chemistry  
[1-4 credit hours (0-1, 0, 0)]  
Tutorial in selected topics in inorganic and organometallic chemistry. S/U grading only.  
Term Offered: Summer, Fall

CHEM 5700 Principles Of Physical Chemistry  
[1-4 credit hours (0-1, 0, 0)]  
Tutorial in selected topics in physical chemistry. S/U grading only.  
Term Offered: Spring, Fall

CHEM 5800 Principles Of Materials Chemistry  
[1-4 credit hours (0, 0, 0-1)]  
Tutorial in selected topics in materials chemistry. S/U grading only.  
Term Offered: Fall

CHEM 6200 Green Chemistry  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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 (4, 0, 0)]  
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 (2, 1, 0)]  
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 (4, 0, 0)]  
A fundamental study of electrochemical concepts, methods, instrumentation and applications.  
Term Offered: Spring

CHEM 6330 Spectroscopic Methods And Analysis Of Spectra  
[4 credit hours (4, 0, 0)]  
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 (4, 0, 0)]  
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 (0, 5, 0)]  
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 (4, 0, 0)]  
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 (4, 0, 0)]
Important methodology and strategy in organic synthesis including
disconnection and retrosynthetic analysis.
Term Offered: Spring

CHEM 6430 Medicinal Chemistry
[4 credit hours (4, 0, 0)]
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 6500 Advanced Biological Chemistry
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
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
Term Offered: Spring

CHEM 6520 Enzymology
[4 credit hours (4, 0, 0)]
Survey of current methods to study enzyme-catalyzed reactions, and
application to examples from major enzyme groups. Current topics in
enzymology include azymes and ribozymes, artificial enzymes, and
enzymes, and enzyme engineering.
Term Offered: Spring

CHEM 6530 Nucleic Acid Chemistry
[4 credit hours (4, 0, 0)]
The structural and chemical properties of nucleic acids and the resulting
biological consequences. Topics include: 3D structures, conformation,
protein/nucleic acid interactions, physical properties and chemical
reactions, mutagenesis, damage/repair, and recombination.
Prerequisites: CHEM 6500
Term Offered: Spring

CHEM 6540 Macromolecular Crystallography
[2 credit hours (2, 0, 0)]
Fundamental theory and practical application of X-ray diffraction to
macromolecular structure determination, including protein crystallization
and manipulation, data collection and reduction, phase solution, electron
density interpretation, structural refinement and validation.
Prerequisites: CHEM 6850
Term Offered: Spring

CHEM 6550 Practical Protein Crystallography
[2 credit hours (1, 3, 0)]
Hands-on training in protein crystallography. Laboratory projects
include: protein crystallization, crystal manipulation and mounting, X-ray
diffraction data collection, data reduction, structure solution, electron
density interpretation, refinement and cultural validation.
Prerequisites: CHEM 6850
Term Offered: Spring

CHEM 6570 Biophysical Chemistry
[4 credit hours (4, 0, 0)]
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.
Term Offered: Fall

CHEM 6580 Bioinorganic Chemistry
[4 credit hours (4, 0, 0)]
Survey of biologically important metals and metal-ligand complexes, and
the role of metal ions in proteins, metal ion transport and regulation, and
metals in medicine.

CHEM 6600 Physical Inorganic Chemistry
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
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 6620 Chemistry of the Main Group Elements
[4 credit hours (4, 0, 0)]
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 6700 Advanced Physical Chemistry
[4 credit hours (4, 0, 0)]
Chemical systems and processes in the context of classical equilibrium
thermodynamics. It introduces non-equilibrium and statistical
themodynamics to elucidate chemical changes and the connection
between molecular and macroscopic system properties.
Term Offered: Fall

CHEM 6710 Quantum_Chemistry and Spectroscopy
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
Advanced topics of current interest is physical chemistry. Examples of topics include nanomaterials science, spectroscopic techniques, or molecular modeling.
Term Offered: Spring, Fall

CHEM 6800 Advanced Materials Chemistry
[4 credit hours (4, 0, 0)]
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.
Term Offered: Spring

CHEM 6810 Materials Science I
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
A materials science approach to the thermodynamics of condensed state equilibria. Phase transformation kinetics.
Term Offered: Fall

CHEM 6850 X-Ray Crystallography
[4 credit hours (4, 0, 0)]
Term Offered: Spring

CHEM 6920 Chemistry Colloquium
[1-4 credit hours (0, 0, 0-2)]
Presentations on research or current literature.
Term Offered: Spring, Summer, Fall

CHEM 6930 Chemistry Seminar
[1-2 credit hours (0, 0, 0-1)]
Seminars conducted by individual members of the department.
Term Offered: Spring, Fall

CHEM 6940 Scientific Communication
[1-2 credit hours (1-2, 0, 0)]
Instructions on different modes of scientific communication: written communication, oral presentation, and research proposal, to enable students to think and converse competently in the language of science.
Term Offered: Spring, Fall

CHEM 6960 Thesis Research
[1-15 credit hours (0, 0, 0-15)]
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 (0, 0, 1-6)]
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 (0-2, 0, 0)]
Discussions of newly developing areas in chemistry research.
Term Offered: Spring, Fall

CHEM 7300 Principles Of Analytical Chemistry
[1-4 credit hours (0, 0, 0-1)]
Tutorial in selected topics in analytical chemistry. S/U grading only.
Term Offered: Fall

CHEM 7400 Principles Of Organic Chemistry
[1-4 credit hours (0, 0, 0-1)]
Tutorial in selected topics in organic chemistry. S/U grading only.
Term Offered: Fall

CHEM 7500 Principles Of Biological Chemistry
[1-4 credit hours (0, 0, 0-1)]
Tutorial in selected topics in biological chemistry. S/U grading only.
Term Offered: Spring, Fall

CHEM 7600 Principles Of Inorganic And Organometallic Chemistry
[1-4 credit hours (0-1, 0, 0)]
Tutorial in selected topics in inorganic and organometallic chemistry. S/U grading only.
Term Offered: Fall

CHEM 7700 Principles Of Physical Chemistry
[1-4 credit hours (0-1, 0, 0)]
Tutorial in selected topics in physical chemistry. S/U grading only.
Term Offered: Fall

CHEM 7800 Principles Of Materials Chemistry
[1-4 credit hours (0, 0, 0-1)]
Tutorial in selected topics in materials chemistry. S/U grading only.
Term Offered: Fall

CHEM 8200 Green Chemistry
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (4, 0, 0)]
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 (2, 1, 0)]
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 (4, 0, 0)]
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 (4, 0, 0)]
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 (4, 0, 0)]
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 (0, 5, 0)]
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 (4, 0, 0)]
This course deals with chemical structure and reactivity correlations applied to the study of organic reaction mechanisms; stereochromatic 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 (4, 0, 0)]
Important methodology and strategy in organic synthesis including disconnection and retrosynthetic analysis.
Term Offered: Spring

CHEM 8430 Medicinal Chemistry
[4 credit hours (4, 0, 0)]
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 8500 Advanced Biological Chemistry
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
A detailed analysis of the structure and function of proteins. Current methodology for the analysis of protein structure, the basis for molecular associations and relationships between structure and biological function.
Prerequisites: CHEM 6500 or CHEM 8500
Term Offered: Spring

CHEM 8520 Enzymology
[4 credit hours (4, 0, 0)]
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 8530 Nucleic Acid Chemistry
[4 credit hours (4, 0, 0)]
The structural and chemical properties of nucleic acids and the resulting biological consequences. Topics include: 3D structures, conformation, protein/nucleic acid interactions, physical properties and chemical reactions, mutagenesis, damage/repair, and recombination.
Prerequisites: CHEM 6500 or CHEM 8500
Term Offered: Spring

CHEM 8540 Macromolecular Crystallography
[4 credit hours (4, 0, 0)]
Fundamental theory and practical application of X-ray diffraction to macromolecular structure determination, including protein crystallization and manipulation, data collection and reduction, phase solution, electron density interpretation, structural refinement and validation.
Prerequisites: CHEM 6850 or CHEM 8850
Term Offered: Spring

CHEM 8550 Practical Protein Crystallography
[2 credit hours (2, 0, 0)]
Hands-on training in protein crystallography. Laboratory projects include: protein crystallization, crystal manipulation and mounting, X-ray diffraction data collection, data reduction, structure solution, electron density interpretation, refinement and cultural validation.
Prerequisites: CHEM 8850
Term Offered: Spring

CHEM 8570 Biophysical Chemistry
[4 credit hours (4, 0, 0)]
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.
Term Offered: Fall
CHEM 8580 Bioinorganic Chemistry  
[4 credit hours (4, 0, 0)]  
Survey of biologically important metals and metal-ligand complexes, and the role of metal ions in proteins, metal ion transport and regulation, and metals in medicine.

CHEM 8600 Advanced Inorganic And Organometallic Chemistry  
[4 credit hours (4, 0, 0)]  
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 (4, 0, 0)]  
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 (4, 0, 0)]  
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: Fall

CHEM 8670 Advanced Physical Chemistry  
[4 credit hours (4, 0, 0)]  
Chemical systems and processes in the context of classical equilibrium thermodynamics. It introduces non-equilibrium and statistical thermodynamics to elucidate chemical changes and the connection between molecular and macroscopic system properties.  
Term Offered: Fall

CHEM 8700 Advanced Physical Chemistry  
[4 credit hours (4, 0, 0)]  
Chemical systems and processes in the context of classical equilibrium thermodynamics. It introduces non-equilibrium and statistical thermodynamics to elucidate chemical changes and the connection between molecular and macroscopic system properties.  
Term Offered: Fall

CHEM 8710 Quantum Chemistry and Spectroscopy  
[4 credit hours (4, 0, 0)]  
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 (4, 0, 0)]  
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 Advanced Materials Chemistry  
[4 credit hours (4, 0, 0)]  
Introduction to important classes of solids, including conductors, magnetic materials, ferroelectrics, glasses, microporous materials, organic solids. Traditional and novel synthic approaches, structure/property relationships, and characterization methods specific to solids.  
Term Offered: Spring

CHEM 8740 Advanced Materials Chemistry  
[4 credit hours (4, 0, 0)]  
Introduction to important classes of solids, including conductors, magnetic materials, ferroelectrics, glasses, microporous materials, organic solids. Traditional and novel synthic approaches, structure/property relationships, and characterization methods specific to solids.  
Term Offered: Spring

CHEM 8740 Advanced Materials Chemistry  
[4 credit hours (4, 0, 0)]  
Introduction to important classes of solids, including conductors, magnetic materials, ferroelectrics, glasses, microporous materials, organic solids. Traditional and novel synthic approaches, structure/property relationships, and characterization methods specific to solids.  
Term Offered: Spring

CHEM 8750 X-Ray Crystallography  
[4 credit hours (4, 0, 0)]  
The use of X-ray diffraction to determine the structure of materials. Basic crystallographic concepts and principles: crystallography, crystal symmetry, space groups, crystal structure determination, and Rietveld refinement.  
Term Offered: Spring

CHEM 8800 Advanced Materials Chemistry  
[4 credit hours (4, 0, 0)]  
Introduction to important classes of solids, including conductors, magnetic materials, ferroelectrics, glasses, microporous materials, organic solids. Traditional and novel synthic approaches, structure/property relationships, and characterization methods specific to solids.  
Term Offered: Spring

CHEM 8810 Materials Science I  
[4 credit hours (4, 0, 0)]  
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 (4, 0, 0)]  
A materials science approach to the thermodynamics of condensed state equilibria. Phase transformation kinetics.  
Term Offered: Spring

CHEM 8830 Materials Science III  
[4 credit hours (4, 0, 0)]  
The role of metal ions in proteins, metal ion transport and regulation, and the connection of changes and the connection between molecular and macroscopic system properties.  
Term Offered: Fall

CHEM 8830 Materials Science III  
[4 credit hours (4, 0, 0)]  
The role of metal ions in proteins, metal ion transport and regulation, and the connection of changes and the connection between molecular and macroscopic system properties.  
Term Offered: Fall

CHEM 8840 Materials Science IV  
[4 credit hours (4, 0, 0)]  
The role of metal ions in proteins, metal ion transport and regulation, and the connection of changes and the connection between molecular and macroscopic system properties.  
Term Offered: Fall

CHEM 8850 X-Ray Crystallography  
[4 credit hours (4, 0, 0)]  
The use of X-ray diffraction to determine the structure of materials. Basic crystallographic concepts and principles: crystallography, crystal symmetry, space groups, crystal structure determination, and Rietveld refinement.  
Term Offered: Spring

CHEM 8850 X-Ray Crystallography  
[4 credit hours (4, 0, 0)]  
The use of X-ray diffraction to determine the structure of materials. Basic crystallographic concepts and principles: crystallography, crystal symmetry, space groups, crystal structure determination, and Rietveld refinement.  
Term Offered: Spring

CHEM 8860 Advanced Inorganic And Organometallic Chemistry  
[4 credit hours (4, 0, 0)]  
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 8870 Advanced Physical Chemistry  
[4 credit hours (4, 0, 0)]  
Chemical systems and processes in the context of classical equilibrium thermodynamics. It introduces non-equilibrium and statistical thermodynamics to elucidate chemical changes and the connection between molecular and macroscopic system properties.  
Term Offered: Fall

CHEM 8880 Advanced Materials Chemistry  
[4 credit hours (4, 0, 0)]  
Introduction to important classes of solids, including conductors, magnetic materials, ferroelectrics, glasses, microporous materials, organic solids. Traditional and novel synthic approaches, structure/property relationships, and characterization methods specific to solids.  
Term Offered: Spring

CHEM 8890 Advanced Materials Chemistry  
[4 credit hours (4, 0, 0)]  
Introduction to important classes of solids, including conductors, magnetic materials, ferroelectrics, glasses, microporous materials, organic solids. Traditional and novel synthic approaches, structure/property relationships, and characterization methods specific to solids.  
Term Offered: Spring

MS in Chemistry  
The master’s program in chemistry increases the professional competence of the chemist beyond the bachelor’s degree. Course work, independent research and small group discussions are emphasized to achieve this goal. The master of science degree can be viewed as an important professional goal or as preparation for study toward the doctoral degree. A non-thesis M.S. option is available for students with full-time employment whose current work responsibilities preclude the
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 (minimum 20 credit hours) as part of the plan of study.

7. Each student must register and successfully complete CHEM 6940.

### Requirements for the Non-Thesis Master’s Program

For the non-thesis master of science degree, students must meet the following departmental requirements:

1. The courses presented must total at least 32 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 courses covering at least three different subdisciplines of chemistry as part of the plan of study.

3. Each student must also complete a graduate industrial internship (CHEM 6970/CHEE 6970). 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.

4. Up to 4 credit hours of 6000-level coursework in a related discipline (e.g., environmental sciences, physics) may be applied to the minimum 12 credit hours of electives if approved by the director of the PSM program and director of graduate studies. Up to 2 credit hours of independent research (CHEM 6980) may also be applied if approved by the director of the PSM program.

### Requirements for the Professional Science Master’s Program in Green Chemistry and Engineering

For the professional science master’s degree, students must meet the following departmental requirements:

1. The courses presented must total at least 36 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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 6200</td>
<td>Green Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 6210</td>
<td>Environmental Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6010</td>
<td>Green Engineering Principles</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6110</td>
<td>Green Engineering Applications</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6600</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>EFSB 6690</td>
<td>Technology Commercialization</td>
<td>3</td>
</tr>
<tr>
<td>or EFSB 6590</td>
<td>New Venture Creation</td>
<td></td>
</tr>
</tbody>
</table>

Select 12 credit hours of elective graduate coursework in traditional areas of chemistry or chemical engineering.

Total Hours 30

3. Each student must also complete a graduate industrial internship (CHEM 6970/CHEE 6970). 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.

4. Up to 4 credit hours of 6000-level coursework in a related discipline (e.g., environmental sciences, physics) may be applied to the minimum 12 credit hours of electives if approved by the director of the PSM program and director of graduate studies. Up to 2 credit hours of independent research (CHEM 6980) may also be applied if approved by the director of the PSM program.
(CHEM 6930) and colloquium (CHEM 6920) cannot be applied towards the 36 hour minimum for the PSM track.

**MSE in Chemistry**

For the degree of master of science and education, students must meet requirements for the degree as stated in the Judith Herb College of Education (p. 299) graduate section of this catalog.

**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. The first stage establishes, through a set of prescribed courses, the foundation for further training. During this stage, a research director is chosen. During the second stage, the student will pursue research toward the dissertation and undertake comprehensive examinations, including the preparation of the required research proposal. After meeting the comprehensive examination requirements, the student is admitted to candidacy in the third stage of the program. This stage is devoted to research and completion of the doctoral dissertation. The departmental degree requirements are listed in the following section. Further details on examinations and admission to candidacy may be obtained from the department.

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.

**Department of Environmental Sciences**

*Timothy G. Fisher, chair*

*Von Sigler, associate chair*

*Daryl L. Moorhead, graduate adviser*

The department of environmental sciences (DES) offers graduate degrees in geology and biology at the master's level and in biology 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.

**Degrees Offered**

- **MS in Geology (p. 245)**
- **MSE in Biology (p. 245)**
- **PhD in Biology (Ecology Track) (p. 245)**
- **MS in Biology (Ecology Track) (p. 246)**

**EEES 5100 Advanced Glacial Geology**

[3 credit hours (3, 0, 0)]

To understand glaciers and glacial landscapes. Topics include mass balance, ice flow, hydrology, erosion, deposition, landforms, glacial lakes and development of the Ohio glacial landscape. Field trip is mandatory.

**Prerequisites:** EEES 3100

**Term Offered:** Spring

**EEES 5150 Organic Evolution**

[3 credit hours (3, 0, 0)]

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**

[3 credit hours (3, 0, 0)]

A course in data management for environmental science graduate students covering the basics of data management practices and the use of Excel and R for data preparation, evaluation, analysis, visualization, and interpretation.

**Term Offered:** Fall

**EEES 5200 Advanced Quaternary Geology**

[3 credit hours (3, 0, 0)]

To provide understanding of such cyclical events as climate change, sea level fluctuations, vegetation change and ice sheet paleogeography during the Quaternary Period and to explore future changes for planet Earth.

**Term Offered:** Spring
EEES 5220 Environmental Geochemistry
[3 credit hours (3, 0, 0)]
Chemical reactions of environmental concern. Water and soil chemistry related to contaminant fate and mobility. Computer software used.  
Term Offered: Spring, Fall

EEES 5240 Soil Science
[3 credit hours (3, 0, 0)]
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

EEES 5250 Soil Ecology
[3 credit hours (3, 0, 0)]
Underlying concepts and theory of modern soil ecology will be reviewed including the biogeochemical cycles and ecological functions of soil, and the effects of human activities. (Spring, alternate years, odd)  
Prerequisites: (BIOL 3050 and EEES 4240) or (BIOL 3050 and EEES 5240)  
Term Offered: Spring, Fall

EEES 5260 Soil Ecology Laboratory
[1 credit hour (0, 3, 0)]
Laboratory exercises designed to complement the material covered in EEES 5250.  
Corequisites: EEES 5250  
Term Offered: Spring, Fall

EEES 5350 Ecology and Conservation of Reptiles and Amphibians
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 or MATH 1850 or MATH 1830 or MATH 1920  
Term Offered: Spring

EEES 5450 Hazardous Waste Management
[3 credit hours (3, 0, 0)]
Environmental regulations concerning hazardous waste, characteristics of hazardous waste and disposal technologies, toxicology, characteristics of organic chemicals and heavy metals, biodegradation, soil science, groundwater contamination, risk assessment, site investigation.  
Term Offered: Fall

EEES 5480 GIS Applications in ENSC
[3 credit hours (3, 0, 0)]
An applications course focused on using GIS techniques and applications in environmental problems and research.  
Term Offered: Spring, Fall

EEES 5490 Remote Sensing of the Environment
[4 credit hours (0, 0, 4)]
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 and EEES 2100  
Term Offered: Fall

EEES 5510 Environmental Microbiology
[3 credit hours (3, 0, 0)]
Microbial diversity and activities in an applied environmental context. Topics include function of microbial ecosystems in energy and carbon flow, bioremediation, and the detection and control of pathogens.  
Prerequisites: (EEES 2150 and CHEM 1230)  
Term Offered: Fall

EEES 5520 Bioremediation
[3 credit hours (3, 0, 0)]
The environmental fate and transport of contaminants; their transformation and biodegradation by plants and microorganisms; bioremediation strategies, including solid phase, slurry phase and vapor-phase treatments, and natural attenuation.  

EEES 5540 Advanced Microbial Ecology
[3 credit hours (3, 0, 0)]
An advanced course focusing on the ecology and public health role of microbes with emphasis on the epidemiology of infectious disease outbreaks.  
Term Offered: Fall

EEES 5550 Advanced Methods Of Microbial Investigation
[3 credit hours (3, 0, 0)]
Student will learn the classical and current methodologies (biochemical and molecular) used in microbial community analysis while developing an understanding of experimental design sample handling and data analysis.  
Prerequisites: EEES 5540

EEES 5610 Solid Earth Geophysics
[3 credit hours (2, 3, 0)]
Survey of theory, field applications, interpretation principles of solid earth and exploration geophysics. Two hours lecture, three hours methods laboratory.  
Prerequisites: (PHYS 2070 and PHYS 2080 and MATH 1850 and MATH 1860)  
Term Offered: Spring, Fall

EEES 5630 Numerical Methods In Geophysics
[3 credit hours (2, 2, 0)]
Numerical filters and matrix operations used to process potential field data and waveforms, isolating anomalies and signals of interest; derivative maps, upward and downward continuation; current interpretation software. Term project.  
Prerequisites: EEES 5610  
Term Offered: Spring
EEES 5650 Advanced Geology Field Studies  
[1-4 credit hours (0, 0, 1-4)]  
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 (3, 0, 0)]  
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  
Term Offered: Fall

EEES 5740 Advanced Aquatic Ecology Laboratory  
[1 credit hour (0, 3, 0)]  
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 (3, 0, 1)]  
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  
Term Offered: Spring

EEES 5760 Advanced Landscape Ecology  
[3 credit hours (3, 0, 0)]  
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  
Term Offered: Spring, Fall

EEES 5790 Ecology Field Study  
[2-4 credit hours (0, 0-18, 0)]  
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  
Term Offered: Spring, Summer

EEES 6100 Glacial Stratigraphy And Geophysics  
[3 credit hours (1, 4, 0)]  
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 6160 Advanced Environmental Data Management  
[3 credit hours (3, 0, 0)]  
A course in data management for environmental science graduate students covering the basics of data management practices and the use of Excel and R for data preparation, evaluation, analysis, visualization, and interpretation.

EEES 6250 Graduate Launch  
[1 credit hour (1, 0, 0)]  
This course prepares graduate students for success by preparing individual study plans, research proposals and presentations, and launching bibliographic research.  
Term Offered: Fall

EEES 6400 Biostatistics  
[4 credit hours (3, 3, 0)]  
Application of statistical inference with environmental and ecological data, including estimation, testing of hypotheses, and statistical modeling.  
Prerequisites: EEES 6160  
Term Offered: Spring, Fall

EEES 6440 Contaminant Hydrogeology  
[3 credit hours (3, 0, 0)]  
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

EEES 6450 Advanced Applied Hydrogeology  
[3 credit hours (3, 0, 0)]  
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: EECS 5410  
Term Offered: Fall

EEES 6500 Multivariable Geostatistics  
[3 credit hours (3, 0, 0)]  
Application of multivariate statistical methods to scientific data. Emphasis is on applied regression, cluster, principal components, factor, correspondence, canonical correlation and discriminant analyses.  
Prerequisites: EEES 6400

EEES 6600 Foundations Of Ecology  
[4 credit hours (4, 0, 0)]  
This course is a thorough review of ecological concepts for graduate students. Readings and discussion include classic papers and historical essays.  
Term Offered: Spring, Fall

EEES 6650 Statistical Modeling in Environmental Sciences  
[4 credit hours (3, 4, 0)]  
Statistical modeling techniques applied to environmental problems, with an emphasis on multilevel modeling.  
Prerequisites: EEES 6400  
Term Offered: Spring

EEES 6810 Writing For The Environmental Sciences  
[4 credit hours (4, 0, 0)]  
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 (1, 0, 0)]
Individual presentation and discussion of papers in the environmental sciences.
Term Offered: Spring, Fall

EEES 6960 Thesis Research
[1-15 credit hours (0, 0, 0-18)]
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 (0-4, 0, 0)]
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 (0-4, 0, 0)]
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 7150 Organic Evolution
[3 credit hours (3, 0, 0)]
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

EEES 7730 Advanced Aquatic Ecology
[3 credit hours (3, 0, 0)]
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
Term Offered: Fall

EEES 7740 Advanced Aquatic Ecology Laboratory
[1 credit hour (0, 0, 0)]
Laboratory exercises on the biology of aquatic populations, communities and ecosystems.
Corequisites: EEES 7730
Term Offered: Fall

EEES 7750 Advanced Conservation Biology
[4 credit hours (3, 0, 1)]
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
Term Offered: Spring

EEES 7790 Ecology Field Trip
[2-4 credit hours (0, 0-18, 0)]
Field study of globally significant ecosystems, including analysis of structural and functional relationships within and between ecosystems. Opportunities for individual student projects.
Prerequisites: EEES 3050
Term Offered: Spring, Summer

EEES 8250 Graduate Launch
[1 credit hour (1, 0, 0)]
This course prepares graduate students for success by preparing individual study plans, research proposals and presentations, and launching bibliographic research.
Term Offered: Fall

EEES 8400 Biostatistics
[4 credit hours (3, 3, 0)]
Application of statistical inference with environmental and ecological data, including estimation, testing of hypotheses, and statistical modeling.
Prerequisites: EEES 6160
Term Offered: Spring, Fall

EEES 8500 Multivariate Geostatistics
[3 credit hours (3, 0, 0)]
Application of multivariate statistical methods to scientific data. Emphasis is on applied regression, cluster, principal components, factor correspondence, canonical correlation and discriminant analyses.
Prerequisites: EEES 8400

EEES 8600 Foundations Of Ecology
[4 credit hours (4, 0, 0)]
This course is a thorough review of ecological concepts for graduate students. Readings and discussion include classic papers and historical essays.
Term Offered: Spring, Fall

EEES 8650 Statistical Modeling in Environmental Sciences
[4 credit hours (3, 4, 0)]
Statistical modeling techniques applied to environmental problems, with an emphasis on multilevel modeling.
Prerequisites: EEES 6400 or EEES 8400
Term Offered: Spring

EEES 8810 Writing For The Environmental Sciences
[3 credit hours (3, 0, 0)]
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 (0, 0, 1)]
Presentation on research or current literature by graduate doctoral students, faculty or guest speakers.
Term Offered: Spring, Fall
MS in Geology

Master of Science in Geology

Option A (Thesis): A minimum of 30 credit hours of approved graduate coursework is required for the master's degree in geology (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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEES 5200</td>
<td>Advanced Quaternary Geology</td>
<td>3</td>
</tr>
<tr>
<td>EEES 5240</td>
<td>Soil Science</td>
<td>3</td>
</tr>
<tr>
<td>EEES 5410</td>
<td>Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>EEES 6100</td>
<td>Glacial Stratigraphy And Geophysics</td>
<td>3</td>
</tr>
<tr>
<td>EEES 6250</td>
<td>Graduate Launch</td>
<td>1</td>
</tr>
<tr>
<td>EEES 6930</td>
<td>Seminar (EEES 6930-009, 1 hour each semester)</td>
<td>1</td>
</tr>
</tbody>
</table>

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 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 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.

MSE in Biology

The master of science and education (MSE) is a degree offered by the Judith Herb College of Education in collaboration with the College of Natural Sciences and Mathematics. Within the degree program, area concentrations are possible in both biology and geology. Students must meet requirements for the degree as stated in the Judith Herb College of Education (p. 299) graduate section of this catalog.

PhD in Biology (Ecology Track)

The doctoral degree in biology (ecology track) 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.

**MASTER OF SCIENCE IN BIOLOGY (ECOLOGY TRACK)**

**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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEES 5160</td>
<td>Advanced Environmental Data Management</td>
<td>3</td>
</tr>
<tr>
<td>EEES 6250</td>
<td>Graduate Launch</td>
<td>1</td>
</tr>
<tr>
<td>EEES 6400</td>
<td>Biostatistics</td>
<td>4</td>
</tr>
<tr>
<td>EEES 6600</td>
<td>Foundations Of Ecology</td>
<td>4</td>
</tr>
<tr>
<td>EEES 6930</td>
<td>Seminar (EEES 6930-009, 1 hour per semester)</td>
<td>1</td>
</tr>
</tbody>
</table>

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.

**Department of Mathematics and Statistics**

*Don White, Chair  
Alessanadro Arsie, Associate Chair  
Geoffrey Martin, Graduate Admissions*

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 Web site at [www.math.utoledo.edu](http://www.math.utoledo.edu). The paragraphs below represent a synopsis of the essential elements.

**Degrees Offered**

- MA in Mathematics (p. 256)
- MAE in Mathematics (p. 256)
- MS in Mathematics (p. 256)
- MSE in Mathematics (p. 257)
- PhD in Mathematics (p. 257)

**MATH 5010 Functions And Modeling For Middle Grade Mathematics**  
[3 credit hours (3, 0, 0)]  
Introduction to the theory of functions through modeling. Subjects include polynomial, exponential, logarithmic and rational functions, interpolation and modeling of data sets through least squares and other methods. Graduate math credit for education students only.

**MATH 5040 Concepts Of Calculus For Middle Grade Mathematics**  
[3 credit hours (3, 0, 0)]  
Introduction to the basic idea of calculus. Subjects include limits, continuity, the derivative and its applications, indefinite and definite integral, Fundamental Theorem of Calculus, evaluation of integrals. Graduate math credit for education students only.

**MATH 5050 Algebraic Concepts For Middle Grade Mathematics**  
[3 credit hours (3, 0, 0)]  
Introduction to basic number theory. Subjects include history of number theory, prime numbers, unique factorization, Euclidean algorithm, Pythagorean relations, number systems, and transformations. Graduate math credit for education students only.

**MATH 5060 Number Theory Concepts For Middle Grade Mathematics**  
[3 credit hours (3, 0, 0)]  
Introduction to basic number theory. Subjects include history of number theory, prime numbers, unique factorization, Euclidean algorithm, Pythagorean relations, number systems, and transformations. Graduate math credit for education students only.

**MATH 5070 Geometry Concepts For Middle School Mathematics**  
[3 credit hours (3, 0, 0)]  
Descriptive geometry in 2 and 3 dimensions, use of axioms and definitions in the proof theorems, formal Euclidean geometry, transformations. Graduate math credit for education students only.

**MATH 5080 History Of Mathematics For Middle Grade Mathematics**  
[3 credit hours (3, 0, 0)]  
Study of the history of mathematics from antiquity to the 20th century concentrating on the development of arithmetic, algebra, geometry and calculus. Graduate math credit for education students only.
MATH 5110 Probability Concepts For Middle Grade Mathematics  
[3 credit hours (3, 0, 0)]  
Introduction to the theory of probability, counting principles and 
combinatorics, risk, coincidence, expectation and conditional probability, 
probability distributions. Graduate math credit for education students only.

MATH 5120 Statistics Concepts For Middle Grade Mathematics  
[3 credit hours (3, 0, 0)]  
Introduction to the fundamental ideas of statistics, including sampling 
techniques, descriptive, variance, confidence intervals, correlation and 
regression. Graduate math credit for education students only.

MATH 5220 Theory Of Interest  
[3 credit hours (3, 0, 0)]  
This course covers the measurement of interest, certain annuities, yield 
rates, amortization and sinking funds, bonds and other securities and 
application of interest theory.

MATH 5260 Actuarial Mathematics I  
[3 credit hours (3, 0, 0)]  
Survival distributions and life tables, life insurance, life annuities, benefit 
premiums and reserves and multiple life functions are some topics 
covered in this course.  
Prerequisites: MATH 5680  
Term Offered: Fall

MATH 5300 Linear Algebra I  
[3 credit hours (3, 0, 0)]  
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 5310 Linear Algebra II  
[3 credit hours (3, 0, 0)]  
Hermitian and normal operators, multilinear forms, spectral theorem and 
other topics.  
Prerequisites: MATH 5300  
MATH 5330 Abstract Algebra I  
[3 credit hours (3, 0, 0)]  
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.  
Prerequisites: MATH 3190  
Term Offered: Fall

MATH 5340 Abstract Algebra II  
[3 credit hours (3, 0, 0)]  
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  
Term Offered: Spring

MATH 5350 Applied Linear Algebra  
[3 credit hours (3, 0, 0)]  
Matrices, systems of equations, vector spaces, linear transformations, 
determinants, eigenvalues and eigenvectors, generalized inverses, rank, 
umerical methods and applications to various areas of science.  
Prerequisites: MATH 1890  
Term Offered: Spring, Summer

MATH 5380 Discrete Structures And Analysis Algorithms  
[3 credit hours (3, 0, 0)]  
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 or MATH 5330  
Term Offered: Fall

MATH 5450 Introduction To Topology I  
[3 credit hours (3, 0, 0)]  
Metric spaces, topological spaces, continuous maps, bases and sub- 
bases, closure and interior operators, products, subspaces, sums, 
quotients, separation axioms, compactness and local compactness.  
Prerequisites: MATH 3190  
Term Offered: Fall

MATH 5460 Introduction To Topology II  
[3 credit hours (3, 0, 0)]  
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  
Term Offered: Spring

MATH 5540 Classical Differential Geometry I  
[3 credit hours (3, 0, 0)]  
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.  
Prerequisites: MATH 3860 or MATH 2860  
MATH 5550 Classical Differential Geometry II  
[3 credit hours (3, 0, 0)]  
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  
MATH 5600 Advanced Statistical Methods I  
[3 credit hours (3, 0, 0)]  
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 
udies. 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 (3, 0, 0)]
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
Term Offered: Spring

MATH 5620 Linear Statistical Models
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MATH 5630 Theory And Methods Of Sample Surveys
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring, Fall

MATH 5640 Statistical Computing
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Probability spaces, random variables, probability distributions, moments and moment generating functions, limit theorems, transformations and sampling distributions.
Prerequisites: (MATH 3190 and MATH 5350)
Term Offered: Summer, Fall

MATH 5690 Introduction To Mathematical Statistics
[3 credit hours (3, 0, 0)]
Sampling distributions, point estimation, interval estimation, hypothesis testing, regression and analysis of variance.
Prerequisites: MATH 5680
Term Offered: Spring

MATH 5710 Methods Of Numerical Analysis I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring

MATH 5740 Advanced Applied Mathematics I
[3 credit hours (3, 0, 0)]
Prerequisites: MATH 3860 or MATH 2860
Term Offered: Fall

MATH 5750 Advanced Applied Mathematics II
[3 credit hours (3, 0, 0)]
Continuation of vector analysis, introduction to complex analysis, partial differential equations, Fourier series and integrals.
Prerequisites: MATH 5740
Term Offered: Spring

MATH 5780 Advanced Calculus
[3 credit hours (3, 0, 0)]
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.
Prerequisites: MATH 2850

MATH 5800 Ordinary Differential Equations
[3 credit hours (3, 0, 0)]
Modern theory of differential equations; transforms and matrix methods; existence theorems and series solutions; and other selected topics.
Prerequisites: MATH 2860
Term Offered: Spring, Fall

MATH 5810 Partial Differential Equations
[3 credit hours (3, 0, 0)]
First and second order equations; numerical methods; separation of variables; solutions of heat and wave equations using eigenfunction techniques; and other selected topics.
Prerequisites: MATH 3860 or MATH 2860
Term Offered: Spring

MATH 5820 Introduction To Real Analysis I
[3 credit hours (3, 0, 0)]
A rigorous treatment of the Calculus in one and several variables. Topics to include: the real number system; sequences and series; elementary metric space theory including compactness, connectedness and completeness; the Riemann Integral.
Prerequisites: MATH 3190
Term Offered: Fall
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Term Offered</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 5830</td>
<td>Introduction To Real Analysis II</td>
<td>3</td>
<td>Spring</td>
<td>MATH 5820</td>
</tr>
<tr>
<td></td>
<td>Differentiable functions on R^n; the Implicit and Inverse Function Theorems; sequences and series of continuous functions; Stone-Weierstrass Theorem; Arzela-Ascoli Theorem; introduction to measure theory; Lebesgue integration; the Lebesgue Dominated Convergence Theorem.</td>
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<tr>
<td>MATH 5860</td>
<td>Calculus Of Variations And Optimal Control Theory I</td>
<td>3</td>
<td>Fall</td>
<td>MATH 5820</td>
</tr>
<tr>
<td></td>
<td>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.</td>
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<tr>
<td>MATH 5870</td>
<td>Calculus Of Variations And Optimal Control Theory II</td>
<td>3</td>
<td>Fall</td>
<td>MATH 5860</td>
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<tr>
<td></td>
<td>Pontryagin’s maximum principle; necessary and sufficient conditions for optimal control, controllability, time optimal control, existence of optimal controls, relationship to the calculus of variations.</td>
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<tr>
<td>MATH 5880</td>
<td>Complex Variables</td>
<td>3</td>
<td>Spring</td>
<td>MATH 2860</td>
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<td></td>
<td>Analytic functions; Cauchy’s theorem; Taylor and Laurent series; residues; contour integrals; conformal mappings, analytic continuation and applications.</td>
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<tr>
<td>MATH 5970</td>
<td>Industrial Math Practicum</td>
<td>1</td>
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<td></td>
<td>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.</td>
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<tr>
<td>MATH 5980</td>
<td>Topics In Mathematics</td>
<td>3</td>
<td>Spring, Summer</td>
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<tr>
<td></td>
<td>Special topics in mathematics.</td>
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<tr>
<td>MATH 6180</td>
<td>Linear And Nonlinear Programming</td>
<td>3</td>
<td>Fall, Summer</td>
<td>MATH 5820</td>
</tr>
<tr>
<td></td>
<td>Simplex algorithm, ellipsoidal algorithm, Karmarkar’s method, interior point methods, elementary convex analysis, optimality conditions and duality for smooth problems, convex programming, algorithms and their convergence.</td>
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<tr>
<td>MATH 6190</td>
<td>Infinite Dimensional Optimization</td>
<td>3</td>
<td>Fall, Summer</td>
<td>MATH 5820</td>
</tr>
<tr>
<td></td>
<td>Introduction to nonlinear analysis, abstract optimization problems on abstract spaces, applications to calculus of variations, optimal control theory and game theory.</td>
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<tr>
<td>MATH 6300</td>
<td>Algebra I</td>
<td>3</td>
<td>Fall</td>
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<tr>
<td></td>
<td>Group actions, Sylow’s theorems, permutation groups, nilpotent and solvable groups, abelian groups, rings, unique factorization domains, fields.</td>
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<tr>
<td>MATH 6310</td>
<td>Algebra II</td>
<td>3</td>
<td>Spring</td>
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<tr>
<td></td>
<td>Field extensions, Galois theory, modules, Noetherian and Artinian rings, tensor products, primitive rings, semisimple rings and modules, the Wedderburn-Artin theorem.</td>
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<tr>
<td>MATH 6400</td>
<td>Topology I</td>
<td>3</td>
<td>Fall</td>
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<tr>
<td></td>
<td>Topological spaces, continuous functions, compactness, product spaces, Tychonov’s theorem, quotient spaces, local compactness, homotopy theory, the fundamental group, covering spaces.</td>
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<tr>
<td>MATH 6410</td>
<td>Topology II</td>
<td>3</td>
<td>Fall</td>
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<tr>
<td></td>
<td>Homology theory, excision, homological algebra, the Brouwer fixed point theorem, cohomology, differential manifolds, orientation, tangent bundles, Sard’s theorem, degree theory.</td>
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<tr>
<td>MATH 6440</td>
<td>Differential Geometry I</td>
<td>3</td>
<td>Spring</td>
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<tr>
<td></td>
<td>Introduction to differential geometry. Topics include differentiable manifolds, vector fields, tensor bundles, the Frobenius theorem, Stokes’ theorem, Lie groups.</td>
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<tr>
<td>MATH 6450</td>
<td>Differential Geometry II</td>
<td>3</td>
<td>Fall</td>
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<td></td>
<td>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.</td>
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<tr>
<td>MATH 6500</td>
<td>Ordinary Differential Equations</td>
<td>3</td>
<td>Fall, Summer</td>
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<tr>
<td></td>
<td>Existence, uniqueness and dependence on initial conditions and parameter, nonlinear planar systems, linear systems, Floquet theory, second order equations, Sturm-Liouville theory.</td>
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<tr>
<td>MATH 6510</td>
<td>Partial Differential Equations</td>
<td>3</td>
<td>Fall, Summer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
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</tr>
</tbody>
</table>
MATH 6520 Dynamical Systems I
[3 credit hours (3, 0, 0)]
Topic include the flow-box theorem, Poincare maps, attractors, w limit sets, Lyapunov stability, invariant submanifolds, Hamiltonian systems and symplectic manifolds.
Prerequisites: MATH 6500

MATH 6530 Dynamical Systems II
[3 credit hours (3, 0, 0)]
Topics may include local bifurcations of vector fields, global stability, ergodic theorems, integrable systems, symbolic dynamics, chaos theory.
Prerequisites: MATH 6520

MATH 6600 Statistical Consulting
[1-5 credit hours (1-5, 0, 0)]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience. May be repeated for credit.
Term Offered: Spring, Fall

MATH 6610 Statistical Consulting II
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Important methods and modeling techniques using generalized linear models and emphasizing loglinear and logit modeling.
Prerequisites: MATH 5680
Term Offered: Spring, Fall

MATH 6630 Nonparametric Statistics
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring, Fall

MATH 6640 Topics In Statistics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Estimation, hypothesis testing, prediction, sufficient statistics, theory of estimation and hypothesis testing, simultaneous inference, decision theoretic models.
Prerequisites: MATH 5680
Term Offered: Fall

MATH 6670 Measure Theoretic Probability
[3 credit hours (3, 0, 0)]
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
Term Offered: Fall

MATH 6670 Theory Of Statistics
[3 credit hours (3, 0, 0)]
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 or (MATH 6650 and MATH 6670)
Term Offered: Spring

MATH 6690 Multivariate Statistics
[3 credit hours (3, 0, 0)]
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 or MATH 6650
Term Offered: Spring

MATH 6720 Methods Of Mathematical Physics I
[3 credit hours (3, 0, 0)]
Analytic functions, residues, method of steepest descent, complex differential equations, regular singularities, integral representation, real and complex vector spaces, matrix groups, Hilbert spaces, coordinate transformations.
Term Offered: Fall

MATH 6730 Methods Of Mathematical Physics II
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MATH 6800 Real Analysis I
[3 credit hours (3, 0, 0)]
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 Luzin's theorems, derivatives, functions of bounded variation.
Prerequisites: MATH 4830 or MATH 5830
Term Offered: Fall

MATH 6810 Real Analysis II
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MATH 6820 Functional Analysis I
[3 credit hours (3, 0, 0)]
Topics include Topological vector spaces, Banach spaces, convexity, the Hahn-Banach theorem, weak and strong topologies, Lp spaces and duality.
Prerequisites: MATH 6810
Term Offered: Fall

MATH 6830 Functional Analysis II
[3 credit hours (3, 0, 0)]
Topics include Topological vector spaces, Banach spaces, convexity, the Hahn-Banach theorem, weak and strong topologies, Lp spaces and duality.
Prerequisites: MATH 6810
Term Offered: Fall
MATH 6830 Functional Analysis II
[3 credit hours (3, 0, 0)]
Topics include the Mackey-Arens Theorem, Banach algebras, spectra in Banach algebras, commutative Banach algebras, unbounded operators, the spectral theorem, topics in functional analysis.
Prerequisites: MATH 6820
Term Offered: Spring

MATH 6840 Complex Analysis I
[3 credit hours (3, 0, 0)]
Elementary analytic functions, complex integration, the residue theorem, infinite sequences of analytic functions, Laurent expansions, entire functions.
Prerequisites: MATH 6800

MATH 6850 Complex Analysis II
[3 credit hours (3, 0, 0)]
Mermorphic 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
Term Offered: Fall

MATH 6860 Measure Theoretic Probability I
[3 credit hours (3, 0, 0)]
Focus on measure theory and probability. Measures and their extensions, integration, convergence theorems, product measures. Probability spaces, random variables and distribution functions, independence, expectation, law of large numbers, central limit theorem, zero-one laws, characteristic functions.
Prerequisites: MATH 5680
Corequisites: MATH 6800

MATH 6930 Colloquium
[1 credit hour (0, 0, 1)]
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 (0, 0, 0-4)]
Problems and techniques of teaching elementary college mathematics, supervised teaching, seminar in preparation methods.
Term Offered: Spring, Fall

MATH 6960 Master Thesis
[3-6 credit hours (0, 0, 0-3)]

MATH 6980 Topics In Mathematical Sciences
[3 credit hours (0, 0, 3)]
Special topics in Mathematics or Statistics.
Term Offered: Spring, Summer, Fall

MATH 6990 Readings In Mathematics
[1-5 credit hours (0, 0, 0-5)]
Readings in areas of Mathematics of mutual interest to the student and the professor.
Term Offered: Spring, Summer, Fall

MATH 7300 Linear Algebra I
[3 credit hours (3, 0, 0)]
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 7310 Linear Algebra II
[3 credit hours (3, 0, 0)]
Hermitian and normal operators, multilinear forms, spectral theorem and other topics.
Prerequisites: MATH 5300

MATH 7330 Abstract Algebra I
[3 credit hours (3, 0, 0)]
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.
Prerequisites: MATH 3190
Term Offered: Fall

MATH 7340 Abstract Algebra II
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MATH 7350 Applied Linear Algebra
[3 credit hours (3, 0, 0)]
Matrices, systems of equations, vector spaces, linear transformations, determinants, eigenvalues and eigenvectors, generalized inverses, rank, numerical methods and applications to various areas of science.
Prerequisites: MATH 1890
Term Offered: Spring

MATH 7380 Discrete Structures And Analysis Algorithms
[3 credit hours (3, 0, 0)]
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 or MATH 5330
Term Offered: Fall

MATH 7450 Introduction To Topology I
[3 credit hours (3, 0, 0)]
Metric spaces, topological spaces, continuous maps, bases and subbases, closure and interior operators, products, subspaces, sums, quotients, separation axioms, compactness and local compactness.
Prerequisites: MATH 3190
Term Offered: Fall

MATH 7460 Introduction To Topology II
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring
MATH 7540 Classical Differential Geometry I
[3 credit hours (3, 0, 0)]
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.
**Prerequisites:** MATH 3860 or MATH 2860

MATH 7550 Classical Differential Geometry II
[3 credit hours (3, 0, 0)]
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

MATH 7600 Advanced Statistical Methods I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
**Term Offered:** Spring

MATH 7620 Linear Statistical Models
[3 credit hours (3, 0, 0)]
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
**Term Offered:** Spring

MATH 7630 Theory And Methods Of Sample Surveys
[3 credit hours (3, 0, 0)]
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
**Term Offered:** Spring

MATH 7640 Statistical Computing
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Probability spaces, random variables, probability distributions, moments and moment generating functions, limit theorems, transformations and sampling distributions.
**Prerequisites:** MATH 3190
**Term Offered:** Fall

MATH 7690 Introduction To Mathematical Statistics
[3 credit hours (3, 0, 0)]
Sampling distributions, point estimation, interval estimation, hypothesis testing, regression and analysis of variance.
**Prerequisites:** MATH 5680
**Term Offered:** Spring

MATH 7710 Methods Of Numerical Analysis I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
**Term Offered:** Spring

MATH 7740 Advanced Applied Mathematics I
[3 credit hours (3, 0, 0)]
**Prerequisites:** MATH 3860 or MATH 2860
**Term Offered:** Fall

MATH 7750 Advanced Applied Mathematics II
[3 credit hours (3, 0, 0)]
Continuation of vector analysis, introduction to complex analysis, partial differential equations, Fourier series and integrals.
**Prerequisites:** MATH 5740
**Term Offered:** Spring
MATH 7800 Ordinary Differential Equations
[3 credit hours (3, 0, 0)]
Modern theory of differential equations; transforms and matrix methods; existence theorems and series solutions; and other selected topics.
Prerequisites: MATH 3860 or MATH 2860
Term Offered: Fall

MATH 7810 Partial Differential Equations
[3 credit hours (3, 0, 0)]
First and second order equations; numerical methods; separation of variables; solutions of heat and wave equations using eigenfunction techniques; and other selected topics.
Prerequisites: MATH 3860 or MATH 2860
Term Offered: Spring

MATH 7820 Introduction To Real Analysis I
[3 credit hours (3, 0, 0)]
A rigorous treatment of the Calculus in one and several variables. Topics to include: the real number system; sequences and series; elementary metric space theory including compactness, connectedness and completeness; the Riemann Integral.
Prerequisites: MATH 3190
Term Offered: Fall

MATH 7830 Introduction To Real Analysis II
[3 credit hours (3, 0, 0)]
Differentiable functions on Rn; the Implicit and Inverse Function Theorems; sequences and series of continuous functions; Stone-Weierstrass Theorem; Arzela-Ascoli Theorem; introduction to measure theory, Lebesgue integration; the Lebesgue Dominated Convergence Theorem.
Prerequisites: MATH 5820
Term Offered: Fall

MATH 7840 Complex Variables
[3 credit hours (3, 0, 0)]
Analytic functions; Cauchy’s theorem; Taylor and Laurent series; residues; contour integrals; conformal mappings, analytic continuation and applications.
Prerequisites: MATH 3860
Term Offered: Spring

MATH 7850 Topics In Mathematics
[3 credit hours (3, 0, 0)]
Special topics in mathematics.
MATH 8400 Topology I
[3 credit hours (3, 0, 0)]
Topological spaces, continuous functions, compactness, product spaces, Tychonov’s theorem, quotient spaces, local compactness, homotopy theory, the fundamental group, covering spaces.
Prerequisites: MATH 7450 or MATH 4450 or MATH 5450
Term Offered: Fall

MATH 8410 Topology II
[3 credit hours (3, 0, 0)]
Homology theory, excision, homological algebra, the Brouwer fixed point theorem, cohomology, differential manifolds, orientation, tangent bundles, Sard’s theorem, degree theory.
Prerequisites: MATH 6400 or MATH 8400
Term Offered: Spring

MATH 8440 Differential Geometry I
[3 credit hours (3, 0, 0)]
Introduction to differential geometry. Topics include differentiable manifolds, vector fields, tensor bundles, the Frobenius theorem, Stokes’ theorem, Lie groups.
Prerequisites: MATH 6440 or MATH 8440
Term Offered: Fall

MATH 8450 Differential Geometry II
[3 credit hours (3, 0, 0)]
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 or MATH 8440
Term Offered: Spring

MATH 8500 Ordinary Differential Equations
[3 credit hours (3, 0, 0)]
Existence, uniqueness and dependence on initial conditions and parameter, nonlinear planar systems, linear systems, Floquet theory, second order equations, Sturm-Liouville theory.
Term Offered: Fall

MATH 8510 Partial Differential Equations
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Topic include the flow-box theorem, Poincare maps, attractors, w-limit sets, Lyapunov stability, invariant submanifolds, Hamiltonian systems and symplectic manifolds.
Prerequisites: MATH 6500 or MATH 8500

MATH 8530 Dynamical Systems II
[3 credit hours (3, 0, 0)]
Topics may include local bifurcations of vector fields, global stability, ergodic theorems, integrable systems, symbolic dynamics, chaos theory.
Prerequisites: MATH 6520 or MATH 8520

MATH 8540 Partial Differential Equations I
[3 credit hours (3, 0, 0)]
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 or MATH 8510
Term Offered: Fall

MATH 8550 Partial Differential Equations II
[3 credit hours (3, 0, 0)]
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 or MATH 8540
Term Offered: Spring

MATH 8600 Statistical Consulting
[1-5 credit hours (1-5, 0, 0)]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience. May be repeated for credit.
Term Offered: Spring, Fall

MATH 8610 Statistical Consulting II
[2 credit hours (2, 0, 0)]
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 (3, 0, 0)]
Important methods and modeling techniques using generalized linear models and emphasizing loglinear and logit modeling.
Prerequisites: MATH 5680 or MATH 7680
Term Offered: Spring, Fall

MATH 8630 Nonparametric Statistics
[3 credit hours (3, 0, 0)]
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 or MATH 7680
Term Offered: Spring, Fall

MATH 8640 Topics In Statistics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Estimation, hypothesis testing, prediction, sufficient statistics, theory of estimation and hypothesis testing, simultaneous inference, decision theoretic models.
Prerequisites: MATH 5680 or MATH 7680
Term Offered: Fall
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<th>Prerequisites</th>
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<tr>
<td>MATH 8670</td>
<td>Measure Theoretic Probability</td>
<td>3</td>
<td>Fall</td>
<td>MATH 5680 or MATH 7680</td>
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<td>Real analysis, probability spaces and measures, random</td>
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<td>variables and distribution functions, independence,</td>
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<td>expectation, law of large numbers, central limit theorem,</td>
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<td>zero-one laws, characteristic functions, conditional</td>
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<td>expectations given a σ-algebra, martingales.</td>
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<td>MATH 8680</td>
<td>Theory Of Statistics</td>
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<td>Exponential families, sufficiency, completeness,</td>
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<td>optimality, equivariance, efficiency, Bayesian and</td>
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<td>minimax estimation. Unbiased and invariant tests,</td>
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<td>estimation and testing. Most accurate confidence</td>
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<td>MATH 8690</td>
<td>Multivariate Statistics</td>
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<td>Multivariate normal sampling distributions, T tests and</td>
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<td>MANOVA, tests on covariance matrices, simultaneous</td>
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<td>inference, discriminant analysis, principal components,</td>
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<td>cluster analysis and factor analysis.</td>
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<td>MATH 8700</td>
<td>Methods Of Mathematical Physics I</td>
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<td>Analytic functions, residues, method of steepest descent,</td>
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<td>complex differential equations, regular singularities,</td>
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<td>integral representation, real and complex vector spaces,</td>
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<td>matrix groups, Hilbert spaces, coordinate transformations.</td>
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<td>MATH 8720</td>
<td>Methods Of Mathematical Physics II</td>
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<td>Self-adjoint operators, special functions, orthogonal</td>
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<td>polynomials, partial differential equations and separation</td>
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<td>of variables, boundary value problems, Green's functions,</td>
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<td>integral equations, tensor analysis, metrics and</td>
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<td>curvature, calculus of variations, finite groups and group</td>
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<td>representations.</td>
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<td>MATH 8730</td>
<td>Methods Of Mathematical Physics II</td>
<td>3</td>
<td>Fall</td>
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<td>Focus on stochastic processes. Conditional expectations,</td>
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<td>martingales, random walks, markov chains, ergodic</td>
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<td>theorem, Brownian motion.</td>
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<td>MATH 8800</td>
<td>Real Analysis I</td>
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<td>Completeness, connectedness and compactness in metric</td>
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<td>spaces, continuity and convergence, Stone-Weierstrass</td>
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<td>Theorem, Lebesgue measure and integration on the real line</td>
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<td>convergence theorems, Egorov's and Lusin's theorems,</td>
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<td>derivatives, functions of bounded variation.</td>
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<td>MATH 8810</td>
<td>Real Analysis II</td>
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<td>The Vitali covering theorem, absolutely continuous</td>
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<td>functions, Lebesgue-Stieltjes integration, the Resiz</td>
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<td>representation theorem, Banach spaces, Lp-spaces,</td>
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<td>abstract measures, the Radon-Nikodym theorem, measures on</td>
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<td>locally compact Hausdorff spaces.</td>
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<td>MATH 8820</td>
<td>Functional Analysis I</td>
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<td>Fall</td>
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<td>Topics include Topological vector spaces, Banach spaces,</td>
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<td>convexity, the Hahn-Banach theorem, weak and strong</td>
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<td>topologies, Lp spaces and duality.</td>
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<td>MATH 8830</td>
<td>Functional Analysis II</td>
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<td>Topics include the Mackey-Arens Theorem, Banach algebras,</td>
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<td>spectra in Banach algebras, commutative Banach algebras,</td>
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<td>unbounded operators, the spectral theorem, topics in</td>
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<td>functional analysis.</td>
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<td>MATH 8840</td>
<td>Complex Analysis I</td>
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<td>Fall</td>
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<td>Elementary analytic functions, complex integration, the</td>
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<td>residue theorem, infinite sequences of analytic functions,</td>
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<td>Laurent expansions, entire functions.</td>
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<td>MATH 8850</td>
<td>Complex Analysis II</td>
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<td>Meromorphic functions, conformal mapping, harmonic</td>
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<td>functions and the Dirichlet problem, the Riemann</td>
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<td>mapping theorem, monodromy, algebraic functions, Riemann</td>
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<td>surfaces, elliptic functions and the modular function.</td>
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<td>MATH 8860</td>
<td>Measure Theoretic Probability II</td>
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<td>Focus on stochastic processes. Conditional expectations,</td>
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<td>martingales, random walks, markov chains, ergodic</td>
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<td>theorem, Brownian motion.</td>
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<tr>
<td>MATH 8930</td>
<td>Colloquium</td>
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<td>Spring, Fall</td>
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<td>Lectures by visiting mathematicians and staff members on</td>
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<td>areas of current interest in mathematics.</td>
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<td>MATH 8940</td>
<td>Proseminar</td>
<td>1-5</td>
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<td>Problems and techniques of teaching elementary college</td>
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<td>MATH 8960</td>
<td>Dissertation</td>
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<tr>
<td>MATH 8980</td>
<td>Topics In Mathematical Sciences</td>
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MATH 8990 Readings In Mathematics
[1-5 credit hours (0, 0, 0-5)]
Readings in areas of Mathematics of mutual interest to the student and the professor.
Term Offered: Spring, Summer, Fall

MA in Mathematics

To obtain the Master of Arts degree in mathematics, students must complete a minimum of 30 semester hours of graduate credit and meet the following requirements:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 5330 &amp; MATH 5340</td>
<td>Abstract Algebra I and Abstract Algebra II</td>
<td>6</td>
</tr>
<tr>
<td>MATH 5820 &amp; MATH 5830</td>
<td>Introduction To Real Analysis I and Introduction To Real Analysis II</td>
<td>6</td>
</tr>
<tr>
<td>MATH 5450 &amp; MATH 5460</td>
<td>Introduction To Topology I and Introduction To Topology II</td>
<td>6</td>
</tr>
<tr>
<td>MATH 5880</td>
<td>Complex Variables</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

- MATH 6300 & MATH 6310 | Algebra I and Algebra II |
- MATH 6400 & MATH 6410 | Topology I and Topology II |
- MATH 6450 | Differential Geometry II |
- MATH 6500 & MATH 6510 | Ordinary Differential Equations and Partial Differential Equations |
- 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:

- 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 |

Any course at the 6000 level listed above

The student must pass a three-part comprehensive examinations 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.

Total Hours 30

MS in Mathematics

The degree of Master of Science can be obtained in one of two options.

Option A – Applied Mathematics: 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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 5710 &amp; MATH 5720</td>
<td>Methods Of Numerical Analysis I and Methods Of Numerical Analysis II</td>
<td>6</td>
</tr>
<tr>
<td>MATH 5820 &amp; MATH 5830</td>
<td>Introduction To Real Analysis I and Introduction To Real Analysis II</td>
<td>6</td>
</tr>
<tr>
<td>MATH 6500 &amp; MATH 6510</td>
<td>Ordinary Differential Equations and Partial Differential Equations</td>
<td>6</td>
</tr>
<tr>
<td>MATH 5540</td>
<td>Classical Differential Geometry I</td>
<td></td>
</tr>
<tr>
<td>MATH 5800</td>
<td>Ordinary Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 5810</td>
<td>Partial Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 5860</td>
<td>Calculus Of Variations And Optimal Control Theory I</td>
<td></td>
</tr>
</tbody>
</table>

Select three of the following:

- MATH 6540 | Classical Differential Geometry I |
- MATH 6550 | Ordinary Differential Equations |
- MATH 6510 | Partial Differential Equations |
- MATH 6520 | Dynamical Systems I |
- MATH 6530 | Dynamical Systems II |
- MATH 6720 | Methods Of Mathematical Physics I |
- MATH 6820 | Functional Analysis I |
- MATH 5880 | Complex Variables |
- MATH 5380 | Discrete Structures And Analysis Algorithms |
- 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.

Total Hours 30

MAE in Mathematics

Master of Science and Education or Master of Arts and Education

For the degree of Master of Arts and education, students must meet requirements for the degree as stated in the Judith Herb College of Education (p. 299) graduate catalog. The following requirements must also be met:

1. A minimum of 36 hours of graduate credit must be completed. MATH 6930 and MATH 6940 do not count toward the 36 hours.
2. The total graduate and undergraduate program must include the following:
   a. at least six hours of abstract algebra and/or linear algebra,
   b. six hours in geometry, statistics, probability and/or computer programming,
   c. three to six hours of analysis (beyond calculus),
   d. three hours of complex analysis and
   e. one course in logic and foundations.
3. The student must pass comprehensive examinations in three of the areas of study of mathematics. The exact areas are to be arranged with the adviser.
4. For information on the education course requirements, see the program description provided by the Judith Herb College of Education (p. 299).
Option B – Statistics: To obtain the degree of Master of Science in the statistics option, the student must complete a minimum of 35 semester hours of graduate credit and meet the following requirements:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 5680</td>
<td>Introduction To Theory Of Probability</td>
<td>3</td>
</tr>
<tr>
<td>MATH 5690</td>
<td>Introduction To Mathematical Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 5600</td>
<td>Advanced Statistical Methods I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 5610</td>
<td>Advanced Statistical Methods II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 5630</td>
<td>Theory And Methods Of Sample Surveys</td>
<td>3</td>
</tr>
<tr>
<td>MATH 5640</td>
<td>Statistical Computing</td>
<td>3</td>
</tr>
<tr>
<td>MATH 6620</td>
<td>Categorical Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MATH 6630</td>
<td>Nonparametric Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 6640</td>
<td>Topics In Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 6650</td>
<td>Statistical Inference</td>
<td>3</td>
</tr>
<tr>
<td>MATH 6690</td>
<td>Multivariate Statistics</td>
<td>3</td>
</tr>
</tbody>
</table>

Pass a two-part comprehensive examination, one part in probability and statistical theory and one part in applied statistics.

Total Hours 36

MSE in Mathematics

Master of Science and Education or Master of Arts and Education

For the degree of Master of Arts and education, students must meet requirements for the degree as stated in the Judith Herb College of Education (p. 299) graduate catalog. The following requirements must also be met:

1. A minimum of 36 hours of graduate credit must be completed. MATH 6930 and MATH 6940 do not count toward the 36 hours.
2. The total graduate and undergraduate program must include the following:
   a. at least six hours of abstract algebra and/or linear algebra,
   b. six hours in geometry, statistics, probability and/or computer programming,
   c. three to six hours of analysis (beyond calculus),
   d. three hours of complex analysis and
   e. one course in logic and foundations.
3. The student must pass comprehensive examinations in three of the areas of study of mathematics. The exact areas are to be arranged with the adviser.
4. For information on the education course requirements, see the program description provided by the Judith Herb College of Education (p. 299).

PhD in Mathematics

The doctorate in mathematics is offered with concentrations in either mathematics or statistics. The broad requirements for these programs are as follows:

1. Each student must pass a preliminary examination at the Master’s level by the end of the first year and a qualifying examination within two years of entering the program. Mathematics students must pass two topics chosen from algebra, topology and analysis. For statistics students, the two topics must be measure-theoretic probability and probability and statistics.
2. A minimum of 90 hours of graduate credit must be completed; 60 hours if the student holds a master’s degree upon entry. MATH 6930 and MATH 6940 do not count in these hours. Mathematics students must complete two-semester sequences at the 6000 level in algebra, topology, real analysis and complex analysis and one other 6000 level sequence. Statistics students must complete probability and statistics, measure-theoretic probability, statistical methods, data analysis and multivariate statistics.
3. The student must pass an oral examination in the general area of the intended thesis research within one year of passing the qualifying examination.
4. All doctoral students are expected to participate in the MATH 6940 on undergraduate teaching methods and to spend two consecutive semesters in supervised teaching. Enrollment in the Proseminar is mandatory every semester if credit hour limitations allow it.

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.

Department of Physics and Astronomy

Sanjay V. Khare, chair
Song Cheng, graduate adviser

Degrees Offered

- MS in Physics (p. 262)
- MSE in Physics (p. 262)
- PhD in Physics (p. 262)
- PSM in Photovoltaics (p. 263)

PHYS 5210 Theoretical Mechanics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Maxwell’s equations and their solutions; electromagnetic radiation.
Prerequisites: PHYS 5230
Term Offered: Spring
PHYS 5310 Quantum Mechanics
[3 credit hours (3, 0, 0)]
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 5510 Condensed Matter Physics
[3 credit hours (3, 0, 0)]
Term Offered: Spring, Fall

PHYS 5620 The Physics Of Lasers
[3 credit hours (3, 0, 0)]
Longitudinal and transverse coherence, stimulated emission, optical pumping, resonator structures, Q-switching, mode-locking and laser systems (gas, dye, diode, doped insulator and free electron lasers).

PHYS 5800 Astronomy In The Planetarium
[3 credit hours (3, 0, 0)]
Theory and practice of astronomical outreach programming. Sky and calendar, mythology, constellations, astrophysics, buying and using small telescopes, operating and maintaining planetarium projectors, sky simulation software, projects and program production.

PHYS 5810 Astrophysics I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring

PHYS 5880 Astrophysics Laboratory
[3 credit hours (1, 5, 0)]
Astronomical, optical and electronic principles of operation of a modern astronomical observatory. Observing with the 1-meter telescope of Ritter Observatory, reduction, analysis and interpretation of astronomical spectra, Six hours laboratory per week.
Corequisites: PHYS 5810
Term Offered: Fall

PHYS 5900 Research Techniques In Physics And Astronomy
[1-6 credit hours (0, 0, 0)]
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 5950 Education Workshop In The Physical Sciences
[1-4 credit hours (0, 0, 0-4)]
For teachers in grades K-12. Introduction to modern physical science concepts suitable for classroom use; lecture and laboratory. Not acceptable for physics degree program.

PHYS 6010 Physics And Astronomy Colloquium
[2 credit hours (2, 0, 0)]
Topical lectures by visiting and local professionals.
Term Offered: Spring, Fall

PHYS 6020 Physics And Astronomy Journal Seminar
[1 credit hour (0, 0, 1)]
Literature review seminar.
Term Offered: Spring, Fall

PHYS 6130 Computational Physics For Research
[3 credit hours (3, 0, 0)]

PHYS 6140 Fundamentals Of Modern Physics
[3 credit hours (3, 0, 0)]
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 (0, 0-6, 0)]
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
Term Offered: Spring

PHYS 6220 Classical Mechanics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 3)]
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
Term Offered: Fall
PHYS 6280 Photovoltaic Materials And Device Physics Laboratory
[3 credit hours (0, 3, 0)]
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 and PHYS 7140
Term Offered: Fall

PHYS 6320 Quantum Mechanics I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 6490 Current Issues In Theoretical Physics
[3 credit hours (3, 0, 0)]
Problems in theory relative to the research programs pursued at the University.

PHYS 6520 Condensed Matter Physics I
[3 credit hours (3, 0, 0)]
A study of the electromagnetic, thermal and elastic properties of condensed matter through the quantum-mechanical treatment of the electrons and elementary excitations.
Prerequisites: PHYS 6330

PHYS 6530 Condensed Matter Physics II
[3 credit hours (3, 0, 0)]
A survey of condensed matter phenomena of interest to experimentalists, as elucidated by theory.
Prerequisites: PHYS 6330

PHYS 6540 Structure, Defects And Diffusion
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
A materials science approach to the thermodynamics of condensed state equilibria and phase transformation kinetics.
Prerequisites: PHYS 6450
Term Offered: Spring

PHYS 6630 Semiconductors I
[3 credit hours (3, 0, 0)]
Prerequisites: PHYS 4510 and EECS 4400
Term Offered: Fall

PHYS 6640 Fundamentals of Solar Cells
[3 credit hours (3, 0, 0)]
Prerequisites: PHYS 4510 and EECS 4400
Term Offered: Spring

PHYS 6690 Current Issues In Optics
[3 credit hours (3, 0, 0)]
Current research in optics and the optical excitation of material modes.

PHYS 6710 Atomic Physics
[3 credit hours (3, 0, 0)]
A study of the fundamental properties of atoms, their theoretical description and experimental measurement. Topics include atomic structure, radiative transitions, external field interactions and atomic collisions.
Term Offered: Fall

PHYS 6720 Atomic & Molecular Spectroscopy
[3 credit hours (3, 0, 0)]
Theory and experimental methods of atomic and molecular spectroscopy. Topics include the theory of interpretation of atomic and molecular spectra and the experimental means to measure the spectra.
Prerequisites: PHYS 6710

PHYS 6770 Accelerator Physics
[3 credit hours (3, 0, 0)]
Basic electrodynamic functioning of charged-particle accelerators, particle dynamics of non-relativistic and relativistic accelerators, accelerator applications, static field and dynamic field accelerator designs.

PHYS 6810 Stellar Astrophysics I
[3 credit hours (3, 0, 0)]
Term Offered: Fall
PHYS 6820 Stellar Astrophysics II  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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 (3, 0, 0)]  
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 (1-6, 0, 0)]  
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 (0, 0, 0)]  
Thesis research required for the M.S. degree.  
Term Offered: Spring, Summer, Fall  

PHYS 6980 Special Topics  
[1-4 credit hours (0-4, 0, 0)]  
Course reserved for visiting lecturers and topics not covered otherwise.  
Term Offered: Spring, Summer, Fall  

PHYS 6990 Independent Study  
[1-4 credit hours (0, 0, 0)]  

PHYS 7130 Computational Physics For Research  
[3 credit hours (3, 0, 0)]  

PHYS 7140 Fundamentals Of Modern Physics  
[3 credit hours (3, 0, 0)]  
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 (0, 0-6, 0)]  
Experiments in nuclear, atomic, and condensed matter physics, such as gamma-ray and X-ray spectroscopies, betas and alpha particle 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 or PHYS 7140  
Term Offered: Spring  

PHYS 7220 Classical Mechanics  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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 (3, 0, 0)]  
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 or PHYS 7250  
Term Offered: Fall  

PHYS 7280 Photovoltaic Materials And Device Physics Laboratory  
[3 credit hours (0, 3, 0)]  
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 and PHYS 7140  
Term Offered: Fall  

PHYS 7320 Quantum Mechanics I  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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 (3, 0, 0)]  
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 7520 Condensed Matter Physics I  
[3 credit hours (3, 0, 0)]  
A study of the electromagnetic, thermal and elastic properties of condensed matter through the quantum-mechanical treatment of the electrons and elementary excitations.  
Prerequisites: PHYS 6330
PHYS 7530 Condensed Matter Physics II
[3 credit hours (3, 0, 0)]
A survey of condensed matter phenomena of interest to experimentalists, as elucidated by theory.
Prerequisites: PHYS 6330

PHYS 7710 Atomic Physics
[3 credit hours (3, 0, 0)]
A study of the fundamental properties of atoms, their theoretical description and experimental measurement. Topics include atomic structure, radiative transitions, external field interactions and atomic collisions.
Term Offered: Fall

PHYS 7720 Atomic & Molecular Spectroscopy
[3 credit hours (3, 0, 0)]
Theory and experimental methods of atomic and molecular spectroscopy. Topics include the theory of interpretation of atomic and molecular spectra and the experimental means to measure the spectra.
Prerequisites: PHYS 6710

PHYS 7810 Stellar Astrophysics I
[3 credit hours (3, 0, 0)]
Term Offered: Fall

PHYS 7820 Stellar Astrophysics II
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0)]
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
[2 credit hours (2, 0, 0)]
Topical lectures by visiting and local professionals.
Term Offered: Spring, Fall

PHYS 8020 Physics And Astronomy Journal Seminar
[1 credit hour (0, 0, 1)]
Literature review seminar.
Term Offered: Spring, Fall

PHYS 8490 Current Issues In Theoretical Physics
[3 credit hours (3, 0, 0)]
Problems in theory relative to the research programs pursued at the University.

PHYS 8540 Structure, Defects And Diffusion
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
A materials science approach to the thermodynamics of condensed state equilibria and phase transformation kinetics.
Prerequisites: PHYS 6540 or PHYS 8540
Term Offered: Spring

PHYS 8590 Current Issues In Condensed Matter And Material Science
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Prerequisites: PHYS 4510 and EECS 4400

PHYS 8690 Current Issues In Optics
[3 credit hours (3, 0, 0)]
Current research in optics and the optical excitation of material modes.

PHYS 8860 General Relativity
[3 credit hours (3, 0, 0)]
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
Term Offered: Fall
MSE in Physics

Requirements for the Master’s Degree

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 and/or PHYS 6020 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 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 (no degree credit for PHYS 5900, PHYS 6010 or PHYS 6020).
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.

M.S. in Physics

PHYS 8870 Cosmology
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

PHYS 8960 Ph. D. Thesis Research
[1-15 credit hours (0, 0, 0)]
Theory research required for the Ph.D. degree.
Term Offered: Spring, Summer, Fall

PHYS 8980 Special Topics
[1-4 credit hours (0-4, 0, 0)]
Course reserved for visiting lecturers and topics not covered otherwise.
Term Offered: Spring, Summer

PHYS 8990 Independent Study
[1-4 credit hours (0, 0, 0)]

MS in Physics

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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 6730</td>
<td>Methods Of Mathematical Physics II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 7220</td>
<td>Classical Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 7250</td>
<td>Classical Electrodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 7260</td>
<td>Classical Electrodynamics II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 7320</td>
<td>Quantum Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 7330</td>
<td>Quantum Mechanics II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 7450</td>
<td>Statistical Mechanics</td>
<td>3</td>
</tr>
</tbody>
</table>

Select at least 18 additional hours of credit in physics in courses numbered higher than 6100 approved by the student’s committee. Dissertation research

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Hours</th>
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<tbody>
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<td></td>
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<td>30-48</td>
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</tbody>
</table>

Total Hours: 90

1 30 to 48 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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 6810/7810</td>
<td>Stellar Astrophysics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 6820/7820</td>
<td>Stellar Astrophysics II</td>
<td>3</td>
</tr>
</tbody>
</table>
PHYS 6830/7830 Galactic Astronomy I 3
PHYS 6840/7840 Galactic Astronomy II 3
Select two related elective courses: 6

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 6710/7710</td>
<td>Atomic Physics</td>
<td></td>
</tr>
<tr>
<td>PHYS 6720/7720</td>
<td>Atomic &amp; Molecular Spectroscopy</td>
<td></td>
</tr>
<tr>
<td>PHYS 8860</td>
<td>General Relativity</td>
<td></td>
</tr>
<tr>
<td>PHYS 8870</td>
<td>Cosmology</td>
<td></td>
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</tbody>
</table>

Other appropriate courses
Select one of the following: 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 6980/8980</td>
<td>Special Topics (on an astrophysics-related topic)</td>
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</tr>
</tbody>
</table>

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:
  
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 8540</td>
<td>Structure, Defects And Diffusion</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 8550</td>
<td>Thermodynamics And Phase Transformations In Condensed Systems</td>
<td>4</td>
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</tbody>
</table>
  
  Total Hours 8

- Two additional elective courses in materials science and engineering chosen from a list of courses approved by the faculty of the Center for Materials Science and Engineering; and
- A dissertation in a materials-related field with a supervisor who is a member of the Center for Materials Science and Engineering.

**PSM in Photovoltaics**

The PSM-PV 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. For the degree of Professional Science Masters in Photovoltaics, a student must complete 37 hours of graduate credit including the following.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 6020</td>
<td>Physics And Astronomy Journal Seminar (must take twice)</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 6250</td>
<td>Classical Electrodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 6280</td>
<td>Photovoltaic Materials And Device Physics Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 6320</td>
<td>Quantum Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 6630</td>
<td>Semiconductors I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 6940</td>
<td>Industrial Internship</td>
<td>6</td>
</tr>
<tr>
<td>PHYS 6960</td>
<td>M.s. Thesis Research</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 6980</td>
<td>Special Topics (Fundamentals of Solar Cells)</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 6990</td>
<td>Independent Study</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6600</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>INFS 6560</td>
<td>Systems Analysis And Design</td>
<td>3</td>
</tr>
<tr>
<td>EFSB 6590</td>
<td>New Venture Creation</td>
<td>3</td>
</tr>
</tbody>
</table>

No thesis is required; however, students are expected to make an oral presentation based on research and independent study.

**Graduate Degrees/Certificates Offered**

- MS in Biology (p. 233)
- MSE in Biology (p. 234)
- PhD in Biology (p. 234)
- MS in Chemistry (p. 239)
- MSE in Chemistry (p. 241)
- PhD in Chemistry (p. 241)
- MS in Geology (p. 245)
- MSE in Biology (p. 245)
- PhD in Biology (Ecology Track) (p. 245)
- MS in Biology (Ecology Track) (p. 246)
- MA in Mathematics (p. 256)
- MAE in Mathematics (p. 256)
- MS in Mathematics (p. 256)
- MSE in Mathematics (p. 257)
- PhD in Mathematics (p. 257)
- MS in Physics (p. 262)
- MSE in Physics (p. 262)
• PhD in Physics (p. 262)
• PSM in Photovoltaics (p. 263)
The College of Nursing at the University of Toledo offers several graduate-level degree and certificate programs. Doctor of Nursing Practice (DNP) and Master of Science in Nursing (MSN) degrees, as well as academic certificates are offered. The Doctor of Nursing Practice Program (DNP) is designed to prepare advanced practice nurses, nurses in leadership positions, and nurses with a Bachelor of Science in Nursing to the highest level of clinical practice in order to meet the increasing complexities and challenges of the nation's health care environment. The MSN concentrations are: Nurse Practitioner, Nurse Educator, and Clinical Nurse Leader. Certificates offered are: Family Nurse Practitioner, Nurse Educator, and Pediatric Primary Care Nurse Practitioner.

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MS, University of Massachusetts, Psychology
MS, University of California, Pediatric Clinical Care Nursing
BSN, University of Michigan

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Assistant Dean, Student Services
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MSN; Thomas Jefferson University
BSN; Ursuline College

David Lymanstall, MEd, MSN, RN
Graduate Nursing Advisor and Instructor
david.lymanstall@utoledo.edu
BA, The University of Toledo
MEd, The University of Toledo
MSN, Medical University of Ohio

College Policies

- Administration of Programs (p. 265)
- Admission Requirements (p. 265)
- Admission to Graduate Programs (p. 267)
- Advising (p. 268)

COGS Graduate Student Handbook (http://www.utoledo.edu/graduate/files/Graduate%20Student%20Handbook%202015-2016.pdf)

- College Policies and Procedures (p. 392)
- Academic Regulations (p. 394)
- Other Policies and Information (p. 399)

Administration of Programs

All graduate programs in the College of Nursing are administered jointly by the college and the College of Graduate Studies of The University of Toledo. Students may contact specific departments, the college's graduate advisor, or the College of Graduate Studies for further information on programs or admission requirements.

Admission Requirements

Doctor of Nursing Practice Degree (DNP): (Post Baccalaureate, BSN-DNP)

To be eligible for admission, applicants must have:

1. Baccalaureate in Nursing from a school that is accredited by a nationally recognized body for nursing education
2. Overall grade point average of 3.0 in undergraduate coursework
3. Official transcripts from all academic institutions attended submitted through NursingCAS
4. Active, unrestricted, unencumbered RN license with eligibility to obtain Ohio RN licensure
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 from professional sources
9. Interview
10. Students accepting admission are required to authorize The University of Toledo 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. The General Subject GRE and TOEFL are required for all applicants whose native language is not English based on the requirements of the UT College of Graduate Studies. Official results are to be sent to institutional code 1845.

Minimum required test scores: http://www.utoledo.edu/graduate/prospectivestudents/admission/guidelines/html.

Doctor of Nursing Practice Degree (DNP): (Post Masters)

To be eligible for admission, applicants must have:

1. MSN/MS (Nursing) in nursing from a school that is accredited by a nationally recognized body for nursing education.
2. Overall grade point average of 3.0 in graduate coursework.
3. Official transcripts from all academic institutions attended submitted through NursingCAS
4. Leadership applicants must hold an active, unrestricted, unencumbered RN license where the student plans to conduct clinical experiences.
5. Direct Care applicants should hold appropriate APRN credentials for the state where student plans to conduct 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
   f. how these challenges will be met.
7. Current resume or CV.
8. Documentation of graduate level supervised clinical hours.
9. Three recommendations from professional sources
10. Interview.
11. Students are required to authorize The University of Toledo 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 Degree**

**Nurse Educator**

To be eligible for admission, applicants must have:

1. Baccalaureate from an accredited college/university. Degree in nursing from a school that is accredited by a nationally recognized body for nursing education.
2. Overall grade point average of 3.0 in undergraduate coursework.
3. Official transcripts from all academic institutions attended, one of which must state the baccalaureate earned.
4. Active, unrestricted, unencumbered RN license where the student plans to conduct clinical experiences.
5. Completion of an undergraduate statistics course recommended.
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 CV.
9. Three recommendations completed by professional sources (Master’s in Nursing preferred).
10. The Graduate Record Examination (General Subject GRE) and TOEFL \(^1\) are required for international applicants.
11. An interview, if requested.
12. Students are required to authorize The University of Toledo 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.

\(^1\) Minimum required test scores: http://www.utoledo.edu/graduate/prospectivestudents/admission/guidelines/html.

**Master of Science in Nursing Degree**

**Family Nurse Practitioner, Pediatric Primary Care Nurse Practitioner,**

**Psychiatric Mental Health Nurse Practitioner, Adult Gerontology Primary Care Nurse Practitioner**

To be eligible for admission, applicants must have:

1. Baccalaureate from an accredited college/university. Degree in nursing from a school that is accredited by a nationally recognized body for nursing education.
2. Overall grade point average of 3.0 in undergraduate coursework.
3. Official transcripts from all academic institutions attended, one of which must state the baccalaureate earned.
4. Active, unrestricted, unencumbered, Ohio RN License.
5. Completion of an undergraduate statistics course recommended.
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 CV.
9. Three recommendations completed by professional sources (Master’s in Nursing preferred).
10. The Graduate Record Examination (General Subject GRE) and TOEFL \(^1\) are required for international applicants.
11. An interview, if requested.
12. Students are required to authorize The University of Toledo 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.

\(^1\) Minimum required test scores: http://www.utoledo.edu/graduate/prospectivestudents/admission/guidelines/html.
Master of Science in Nursing Degree
Graduate Entry Clinical Nurse Leader (CNL)

To be eligible for admission, applicants must have:

1. Baccalaureate from an accredited college/university.
2. Cumulative grade point average of 3.0 in undergraduate coursework.
3. Official transcripts from all academic institutions attended, one of which must state the baccalaureate earned.
4. Completion of six semester credits of Human Anatomy and Physiology with a grade of "B" or higher.
5. Completion of three semester credits of psychology.
6. Completion of three semester credits of social science.
7. Computer competency that includes word processing skills and ability to communicate electronically.
8. Personal statement describing career goals, future plans for employment, and expectations for graduate study.
9. Current resume or CV.
10. Three recommendations completed by professional sources.
11. TOEFL\(^1\) is required for international applicants. Must be taken within the past 2 years.
12. An interview, if requested.
13. Students are required to authorize The University of Toledo 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.

\(^1\) Minimum required test scores: http://www.utoledo.edu/graduate/prospectivestudents/admission/guidelines/html.

Certificates Family Nurse Practitioner,
Pediatric Primary Care Nurse Practitioner

To be eligible for admission, applicants must have:

1. Master's degree in nursing from a school that is accredited by a nationally recognized body for nursing education.
2. Overall grade point average of 3.0 in graduate coursework.
3. Official transcripts from all academic institutions attended, one of which must state the Master's degree earned.
4. Active, unrestricted, unencumbered, Ohio RN License.
5. Computer competency that includes word processing skills and ability to communicate electronically.
6. Personal statement describing career goals, future plans for employment and expectations for graduate study.
7. Current resume or CV.
8. Three recommendations from professional sources (Master in Nursing preferred).
9. The Graduate Record Exam (General Subject GRE) and TOEFL\(^1\) are required for international applicants.

\(^1\) Minimum required test scores: http://www.utoledo.edu/graduate/prospectivestudents/admission/guidelines/html.

Nurse Educator Certificate

To be eligible for admission, applicants must have:

1. Baccalaureate from an accredited college/university. Degree in nursing from a school that is accredited by a nationally recognized body for nursing education.
2. Overall grade point average of 3.0 in undergraduate coursework.
3. Official transcripts from all academic institutions attended, one of which must state the baccalaureate earned.
4. Active, unrestricted, unencumbered RN License in the state in which the applicant practices
5. Computer competency that includes word processing skills and ability to communicate electronically.
6. Personal statement describing career goals, future plans for employment and expectations for graduate study.
7. Current resume or CV.
8. Three recommendations from professional sources (Master in Nursing preferred).
9. The Graduate Record Exam (General Subject GRE) and TOEFL\(^1\) are required for international applicants.
10. Interview, if requested.
11. Students are required to authorize The University of Toledo 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.

\(^1\) Minimum required test scores: http://www.utoledo.edu/graduate/prospectivestudents/admission/guidelines/html.

Admission to Graduate Programs

Applications are completed through Nursing CAS at http://nursingcas.liaisoncas.com and by submitting a nursing supplemental application to the University of Toledo: http://apply.utoledo.edu.

Admission is competitive.

NursingCAS and nursing supplemental application deadlines can be found at www.utoledo.edu/nursing/howtapply.html (http://www.utoledo.edu/nursing/howtapply.html). Applications must be electronically submitted by the posted deadlines.
Computer competency includes word processing skills and the ability to communicate electronically.

Advising

Students must meet with their 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 complete the plan of study during the first semester of matriculation.

Please note that students matriculate into a specific program track in the MSN and DNP programs, and are allowed to take the courses within their program of study. Students who desire to take other courses outside of their approved program track need permission of course faculty, program directors and advisor. Permission is not guaranteed. In addition, students must apply to a Graduate Nurse program unless otherwise specified, and be accepted into a specific program in order to take CON Nursing graduate courses. Graduate nursing courses are not available to non-degree seeking guest students.

Graduate Programs

Approval

Accreditation

The Baccalaureate Degree in Nursing; the Master’s Degree in Nursing; the Doctor of Nursing Practice Program; and the Post Graduate APRN Certificate Program at The University of Toledo College of Nursing is accredited by:

The Commission on Collegiate Nursing Education
One Dupont Circle, NW, Suite 530
Washington, DC 20036
202.887.6791

Approval

The University of Toledo College of Nursing Clinical Nurse Leader Program has full approval by the Ohio Board of Nursing.

Degrees Offered

• Doctor of Nursing Practice: (Post Baccalaureate, BSN-DNP) (p. 273)
• Doctor of Nursing Practice: (Post-Master, MSN - DNP) (p. 274)
• Graduate Certificate: Family Nurse Practitioner (p. 275)
• Graduate Certificate: Nurse Educator (p. 275)
• Graduate Certificate: Pediatric Primary Care Nurse Practitioner (p. 276)
• MS in Nursing: Adult Gerontology Nurse Practitioner (p. 276)
• MS in Nursing: Family Nurse Practitioner (p. 276)
• MS in Nursing: Graduate Entry Clinical Nurse Leader (p. 277)
• MS in Nursing: Nurse Educator (p. 277)
• MS in Nursing: Pediatric Primary Care Nurse Practitioner (p. 278)
• MS in Nursing: Psychiatric Mental Health Nurse Practitioner (p. 278)

NURS 5020 Adult Health Nursing III
[4 credit hours (0, 0, 0)]

NURS 5040 Hlth Assess and Nrs Prmng Hlth
[6 credit hours (6, 6, 6)]

Using Orem’s SCDT, students assess individuals and families and apply the nursing process in order to promote the health of individuals and families across the life span. Includes 30 clinical hours.

Term Offered: Fall

NURS 5050 Integrative Hlth Science I
[3 credit hours (3, 0, 0)]

Examines foundational chemical, physical, cellular biological, and microbiological principles of human physiology. Focuses on advanced physiologic and pathophysiologic mechanisms underlying human responses to genetic, defense, and nervous system disease.

Term Offered: Fall

NURS 5060 Professional Socialization I
[3 credit hours (3, 0, 0)]

Focuses on the development of the professional nursing role. Students explore the effects of historical, legal, and ethical influences on professional nursing. Cultural diversity also is examined.

Term Offered: Fall

NURS 5070 Therapeutic Comm Skills Nurses
[3 credit hours (3, 3, 0)]

Focuses on therapeutic communication skills at the intrapersonal and interpersonal levels. Explore nursing agency from a holistic perspective. Includes 30 clinical hours.

Term Offered: Fall

NURS 5140 Design Nurs Sys Promote Slf Cr
[0-7 credit hours (0-7, 0-7, 0)]

Apply Orem's SCDT in the design and implementation of nursing systems that assist individuals and families in achieving and maintaining optimal health. Includes 90 clinical hours.

Term Offered: Spring

NURS 5160 Professional Socialization II
[3 credit hours (3, 0, 0)]

Integrate nursing theory and models into professional nursing practice. Focuses on ethical, political, and economic issues that impact nursing practice. Differentiation of advanced practice and entry level roles are explored.

Term Offered: Spring

NURS 5190 Adv Interpersonal Intervention
[2,3 credit hours (0, 0, 0)]

Integrates interpersonal strategies and complementary modalities through peer counseling and supervision. Analyzes personal abilities and limitations in developing therapeutic relationships with individuals and groups. Includes 60 hours clinical.

Term Offered: Spring, Fall

NURS 5220 Field Experience Seminar
[1-3 credit hours (0, 0, 0)]

Program capstone experience that integrates nursing theory, research, and practice to fulfill the requirements of the MSN degree.

Term Offered: Spring, Summer, Fall
NURS 5240 Design Nurs Sys Com Hlth Sts
[6 credit hours (6, 6, 0)]
Using Orem’s SCDT, students design and implement nursing systems that assist individuals and families with complex problems to achieve and maintain optimal health. End of life care is addressed. Includes 120 clinical hours.
Term Offered: Summer

NURS 5250 Health Science II
[3 credit hours (3, 0, 0)]
Focuses on advanced physiologic and pathophysiologic mechanisms underlying disease across the life span. Examines cardiovascular, respiratory, endocrine, muscular skeletal, nervous, genitourinary, hepatobiliary, renal, integumentary and gastrointestinal systems.
Prerequisites: (NURS 504 or NURS 5040) and (NURS 505 or NURS 5050) and (NURS 506 or NURS 5060) and (NURS 507 or NURS 5070)
Term Offered: Spring

NURS 5330 Health Assessments
[3 credit hours (1, 2, 0)]
Focuses on acquisition of graduate level skills in collection and documentation of assessment data across the life-span. Differentiates normal from abnormal findings. Supervised laboratory practice is required.
Term Offered: Summer

NURS 5400 Theoretical and Ethical Foundation
[3 credit hours (3, 0, 3)]
Explores roots of nursing as a science and art. Examines personal and professional values in the context of ethical decision-making. Emphasis is on analysis and evaluation of selected nursing and ethical theories. Course Enrollment is Limited.
Term Offered: Spring, Fall

NURS 5440 Population Focused Care
[6 credit hours (6, 0, 0)]
Students apply epidemiological principles and Orem’s SCDT to improve the health status of aggregates, vulnerable populations and communities. Includes 90 clinical hours.
Term Offered: Fall

NURS 5500 Family and Cultural Diversity
[3 credit hours (3, 0, 3)]
Term Offered: Spring, Fall

NURS 5510 Adv Clinical Seminar: Nursing
[3 credit hours (0, 0, 0)]
Application of nursing theory and research with clients in wellness promotion or complex care states. Emphasis is on the assessment and analysis of human responses and outcomes of care.
Term Offered: Fall

NURS 5530 Public Policy and Health Care
[2-3 credit hours (2-3, 0, 2-3)]
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

NURS 5540 Adv Practicum Nurs Sys Design
[12 credit hours (12, 0, 0)]
Students demonstrate integration of nursing knowledge and skill in designing and implementing nursing systems in a capstone clinical experience. Includes 300 clinical hours.
Term Offered: Spring

NURS 5610 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adults
[7 credit hours (3, 0, 4)]
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
Corequisites: NURS 5680, NURS 5690

NURS 5620 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical II Child, Adolescent, Family
[7 credit hours (3, 0, 4)]
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 and NURS 5690

NURS 5630 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adults
[9 credit hours (3, 0, 6)]
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 and NURS 5620

NURS 5670 Pharmacology
[3 credit hours (3, 0, 0)]
Focuses on fundamental pharmacological principles. Prepares for critical thinking in application of pharmacotherapeutics to nursing. Emphasizes physiological responses to drugs, expected outcomes, and potential drug interactions.
Prerequisites: (NURS 504 or NURS 5040) and (NURS 505 or NURS 5050) and (NURS 506 or NURS 5060) and (NURS 507 or NURS 5070)
Term Offered: Spring, Summer

NURS 5680 Advanced Physiology and Pathophysiology
[3 credit hours (3, 0, 0)]
Focuses on advanced physiologic and pathophysiologic mechanisms underlying human responses to disease across the life-span. Students will build on existing knowledge of human anatomy and physiology. Course Enrollment is Limited.
Term Offered: Spring, Summer, Fall

NURS 5690 Adv Pharmacotherapeutics
[3 credit hours (3, 0, 0)]
Focuses on advanced pharmacologic principles in decision-making for pharmacotherapy. Emphasizes responses to drugs, expected outcomes, and potential drug interactions. Discusses professional responsibilities of prescriptive privileges.
Term Offered: Spring, Fall
NURS 5740 Advanced Health Assessments  
[4 credit hours (0, 0, 0)]  
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. Course Enrollment is Limited. Includes 60 hours laboratory.  
Term Offered: Spring, Fall  

NURS 5810 PNP I: Care of Children - Well  
[6 credit hours (0, 0, 0)]  
Focuses on the health care needs of children and adolescents and principles of health promotion and wellness. Students will have an opportunity to begin development of skills in primary and specialty care settings. Includes 180 hours clinical.  
Term Offered: Spring, Summer  

NURS 5820 PNP Clin II: Acute/Chronic  
[6 credit hours (0, 0, 0)]  
Focuses on the care of children and adolescents with an emphasis on the management of common acute and stable chronic illnesses. Includes 180 hours clinical.  
Term Offered: Fall  

NURS 5830 PNP Clinical III: Complex  
[6 credit hours (3, 3, 0)]  
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 582 or NURS 5820)  
Term Offered: Spring  

NURS 5910 Advanced Nursing Research  
[3 credit hours (3, 0, 3)]  
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.  
Term Offered: Spring, Summer, Fall  

NURS 5980 Comprehensive Exam in Nursing  
[3 credit hours (0, 0, 0)]  
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 6070 Adv Comm Skills Grp Dynamics  
[3 credit hours (3, 0, 0)]  
Focuses on advanced therapeutic communication skills in the nurse-client relationship and analysis of Self-care agency. Complementary modalities are explored. Includes 30 clinical hours.  
Term Offered: Fall  

NURS 6140 Adv Pract Nurs: Role and Issue  
[2 credit hours (2, 0, 0)]  
Focuses on the issues and role of the advanced practice nurse, including historical and current perspectives of the advanced role. Examines health care system issues pertaining to advanced practice.  
Term Offered: Spring, Fall  

NURS 6210 FNP Clin I: Adolescent and Adult  
[6-7 credit hours (0, 0, 0)]  
Focuses on primary care of common and chronic illness of adolescents and adults. Clinical experiences will continue to incorporate women and children, adults, and target populations. Includes 180 clinical hours.  
Term Offered: Spring, Summer  

NURS 6220 FNP Clin II:Women and Children  
[6,7 credit hours (0, 0, 0)]  
Focuses on the primary care of children and women's health and includes normal prenatal care. Emphasis is on health promotion and common acute illness. Includes 180 clinical hours.  
Term Offered: Fall  

NURS 6230 FNP Clin III:Adults/Older Adult  
[6-8 credit hours (0, 0, 0)]  
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.  
Term Offered: Spring  

NURS 6310 Adult Gerontology Nurse Practitioner Theory and Clinical  
Adolescents and Young Adults  
[7 credit hours (3, 0, 4)]  
Holistic care of culturally diverse adolescents and young adults in multiple care settings. Assessment and management of common acute and chronic health problems with emphasis on health promotion and risk reduction.  
Prerequisites: NURS 5740 and NURS 5680  

NURS 6320 Adult Gerontology Nurse Practitioner Theory and Clinical II  
Adults  
[7 credit hours (3, 0, 4)]  
Holistic care of culturally diverse adults in multiple care settings with emphasis on gender specific health care needs and principles of health promotion and wellness.  
Prerequisites: NURS 6310 and NURS 5690  

NURS 6330 Adult Gerontology Nurse Practitioner Theory and Clinical III  
Older Adults  
[8 credit hours (2, 0, 6)]  
Holistic care of culturally diverse older adults in multiple care settings with emphasis on care management of acute and chronic conditions, emergent issues and end of life concerns.  
Prerequisites: NURS 6320  

NURS 6710 Develop Instruc Progrm Nursing  
[3 credit hours (3, 0, 0)]  
Focuses on skills to develop curricular components for nursing instructional programs. Examines the relationships among mission, philosophy, goals, and outcomes for various learning environments.  
Term Offered: Summer  

NURS 6720 Tchg, Lrng and Evaluation Nurs  
[4 credit hours (4, 0, 4)]  
Focuses on teaching-learning theories, processes, strategies, and styles. Examines evaluation principles and strategies in the classroom and clinical setting.  
Term Offered: Spring
NURS 6730 Practicum/Seminar in Teaching
[3-4 credit hours (0, 0, 0)]
Applies knowledge of learning and evaluation theories in the development and implementation of a program of instruction. Within a seminar format, emphasizes significant issues in healthcare education.
Term Offered: Fall

NURS 6890 Independent Study in Nursing
[0-4 credit hours (0, 0, 0)]
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 6990 Thesis Research
[1-3 credit hours (0, 0, 0)]
Research in nursing to fulfill the research requirement of the Nursing Master’s Program. The (required) 2 credit hours may be divided and repeated across semesters. Only 2 credit hours are applicable for the degree. May be repeated for credit.
Term Offered: Spring, Summer, Fall

NURS 7000 BSN-DNP Orientation
[1 credit hour (0, 0, 1)]
Focuses on pertinent information needed by incoming students in the BSN-DNP Program. Empasis on requirements of The University of Toledo and the College of Nursing to matriculate in the Program.
Term Offered: Fall

NURS 7010 Scientific Basis Nsg Practice
[3 credit hours (0, 0, 3)]

NURS 7011 Theoretical Basis for Evidence-Based Practice
[3 credit hours (0, 0, 3)]

NURS 7020 Org Systems Leadership in Hlth
[3 credit hours (3, 3, 0)]
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: Fall

NURS 7030 Qual Mgmt/Perf Improve Hlth Or
[3 credit hours (3, 3, 0)]
Examines principles/practice of quality management/clinical performance in care delivery and outcomes. Focuses on role and accountability of the advanced practice nurse/collaborative team for maintaining safety and improving quality of care.
Term Offered: Spring, Fall

NURS 7040 Applied Nursing Research
[3 credit hours (0, 0, 0)]
This course builds on knowledge of research and clinical practice with emphasis on evidence-based practice. Students learn to critically examine and apply nursing research within the practice setting.
Term Offered: Spring, Fall

NURS 7050 Inf Tech Nsg & Hlth Care Syst
[3 credit hours (0, 0, 0)]
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 (3, 0, 0)]
This course uses epidemiologic models to analyze and construct interventions for health care delivery systems. The focus is on safe, quality, culturally-appropriate advanced nursing practice activities to meet emerging world needs.
Prerequisites: INDI 6000 or INDI 8000
Term Offered: Spring

NURS 7070 Mktg/Entrep Act Cmplx Hlth Cr
[3 credit hours (3, 0, 0)]
This course examines marketing and entrepreneurial strategies for advanced nursing practice in complex health care systems. The focus is on creating and evaluating marketing plans and entrepreneurial activities.
Term Offered: Spring

NURS 7080 Evidence Based Nursing Practice in Direct Care
[3 credit hours (0, 0, 0)]
This course examines diagnostic laboratory and imaging methods as foundational evidence for assessment and intervention in the care of patient populations. The focus is on examining the basis for diagnosis using laboratory and imaging procedures, assessing the quality and reliability/sensitivity of diagnostic test results, understanding the technology used in diagnostic testing, and utilizing cost-benefit data in ordering diagnostic testing.
Term Offered: Spring, Fall

NURS 7090 Project Seminar
[1-3 credit hours (0, 0, 0)]
This course provides a forum to articulate and explore advanced nursing practice roles and responsibilities. The focus will be on leading nursing practice in patient advocacy, teaching, collaboration, and the design and provision of care.
Term Offered: Summer, Fall

NURS 7100 Doctoral Project
[1-3 credit hours (0, 0, 0)]
This course is guided, independent project utilizing research to improve patient outcomes, health care delivery, or nursing practice.
Prerequisites: (NURS 7040 and NURS 7010 and NURS 7090) or (NURS 704 and NURS 701 and NURS 709)
Term Offered: Spring, Summer, Fall

NURS 7180 Evdnc Base Admin Comp Hlth Sys
[3 credit hours (0, 0, 0)]
This course examines evidence practices in administrative health care settings. The focus is on examining current status and creating and evaluating innovative administrative practices based on best practices. Competencies include model application for finance and clinical outcomes.
Term Offered: Fall
NURS 7210 Family Nurse Practitioner Clinical I: Primary Care of Adolescents and Adults [7 credit hours (3, 0, 4)]
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 7740 and NURS 7400 and NURS 7410
Corequisites: NURS 7690
Term Offered: Summer, Fall

NURS 7220 Family Nurse Practitioner Clinical II: Primary Care of Women and Children [7 credit hours (3, 0, 4)]
Focuses on primary care of children/women's health. Emphasis on health promotion and common acute illness, role development.
Prerequisites: NURS 7210
Term Offered: Spring, Fall

NURS 7230 Family Nurse Practitioner Clinical III: Primary Care of Adults and Older Adults [8 credit hours (2, 0, 6)]
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
Term Offered: Spring, Fall

NURS 7310 Adult Gerontology Nurse Practitioner Theory and Clinical I Adolescents and Young Adults [7 credit hours (3, 0, 4)]
Holistic care of culturally diverse adolescents and young adults in multiple care settings. Assessment and management of common acute and chronic health problems with emphasis on health promotion and risk reduction.
Prerequisites: NURS 7740 and NURS 7680

NURS 7320 Adult Gerontology Nurse Practitioner Theory and Clinical II Adults [7 credit hours (3, 0, 4)]
Holistic care of culturally diverse adults in multiple care settings with emphasis on gender specific health care needs and principles of health promotion and wellness.
Prerequisites: NURS 7310 and NURS 7690

NURS 7400 Theoretical Foundations of Advanced Nursing Practice [2 credit hours (0, 0, 2)]
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: Fall

NURS 7410 Ethical Foundations of Advanced Nursing Practice [2 credit hours (0, 0, 2)]
Examines the inter-relationship between theory, research, practice in ethical decision-making. Focuses on critical analysis/evaluation of selected ethical theories, values, professional codes of ethics related to evidence-based practices.
Corequisites: NURS 7000
Term Offered: Spring

NURS 7500 Family and Cultural Diversity Theories [3 credit hours (0, 0, 3)]
Explores family and cultural diversity theories and process. Examines assessment, analysis, and evaluation of family function. Analyzes cultural competence of advanced practice nursing.
Term Offered: Spring, Fall

NURS 7530 Public Policy and Health Care [3 credit hours (0, 0, 3)]
This course explores the public policy process from agenda setting through program evaluation. The focus is on how health problems are brought to the attention of government and solutions are obtained. Some field work is required.
Term Offered: Spring, Summer

NURS 7610 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adult [7 credit hours (3, 0, 4)]
Focuses on preparing the student in the advanced practice role for assessment, diagnosis, and treatment planning of acute and chronic psychiatric disorders and mental health care needs of individuals across the lifespan.
Prerequisites: NURS 7050 and NURS 7400 and NURS 7610 and NURS 7680 and NURS 7740
Corequisites: NURS 7690

NURS 7620 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical II Child Adolescent Family [7 credit hours (3, 0, 4)]
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 and NURS 7690

NURS 7630 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adult [9 credit hours (3, 0, 6)]
Focus on acute or chronic psychiatric or mental health issues faced by older adults and their families- dementia, delirium, and depression.
Prerequisites: NURS 7610 and NURS 7620

NURS 7680 Advanced Physiology and Pathophysiology [3 credit hours (0, 0, 3)]
Focuses on advanced physiologic and pathophysiologic mechanisms underlying human responses to illness across their life-span. Students will build on existing knowledge of human anatomy and physiology.
Term Offered: Spring, Fall

NURS 7690 Advanced Pharmacotherapeutics [3 credit hours (3, 0, 0)]
NURS 7740 Advanced Health Assessment [5 credit hours (3, 2, 0)]
Focuses on acquisition of advanced skills in collection and documentation of assessment data across the life-span. Differentiates normal, abnormal physiologic/psychosocial findings. Analyzes abilities/limitations in developing therapeutic relationships. Supervised laboratory practice.
Prerequisites: NURS 7680
Term Offered: Spring
NURS 7810 Pediatric Nurse Practitioner Clinical I: Care of Children and Concepts of Wellness
[6 credit hours (2, 0, 4)]
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 and NURS 7410 and NURS 7740
Corequisites: NURS 7690
Term Offered: Summer

NURS 7820 Pediatric Nurse Practitioner Clinical II: Common Acute, and Stable Chronic Illnesses
[6 credit hours (2, 0, 4)]
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 individuals and groups.
Prerequisites: NURS 7810

NURS 7830 Pediatric Nurse Practitioner Clinical III: Complex Chronic Illnesses or Disabilities
[6 credit hours (2, 0, 4)]
Integration of the advanced practice role.
Prerequisites: NURS 7820

NURS 7890 Independent Study
[1-4 credit hours (0, 0, 1-4)]
NURS 7890 is an academic course completed outside of the required classroom, clinical or college laboratory experiences that provide the learner with an opportunity to pursue an area of interest in depth. This course may not be used to substitute for required courses. The course is supervised by a faculty member and approved by the Program director. A contract must be completed by the student and approved by the faculty member and the program director prior to the semester in which the Independent Study is to be conducted. Faculty approval is required before the student can register for this course.
Term Offered: Spring, Summer, Fall

NURS 7910 Advanced Nursing Research
[3 credit hours (3, 0, 0)]
Students will identify a research problem and develop an appropriate conceptual framework. They will critically review published research in the area of interest and identify appropriate design, methods and statistical analysis. Major approaches of qualitative and quantitative methodologies will be explored.
Prerequisites: INDI 8000 and NURS 7400
Term Offered: Spring

NURS 7920 Outcomes Methods for Advanced Practice Nurses
[3 credit hours (0, 0, 3)]
Emphasis on statistical methods associated with outcome measurement, experimental and quasi-experimental designs, meta-analysis and meta-synthesis. Evaluates nursing evidence in support of evidence-based practice protocol, development and evaluation.
Prerequisites: INDI 8000 and NURS 7910
Corequisites: NURS 7040
Term Offered: Fall

NURS 7970 Final Practicum (Direct Care)
[1-6 credit hours (0, 0, 0)]
Individually precepted practicum that requires advanced nursing practice with individuals and groups. Includes seminar that facilitates synthesis and application of all prior learning for evidence-based practice.
Prerequisites: NURS 7010 or NURS 7011 or NURS 701
Term Offered: Spring, Summer, Fall

NURS 7980 Final Practicum (Indirect Care)
[1-6 credit hours (0, 0, 1-6)]
Individually precepted practicum that requires leadership and practice at the aggregate/systems/organizational level of health care. Includes required seminar that facilitates application, synthesis, and evaluation of prior learning in applied practice.
Term Offered: Spring, Summer, Fall

NURS 8000 Intro to Biostatistical Method
[3 credit hours (0, 0, 3)]

Doctor of Nursing Practice: (Post Baccalaureate, BSN-DNP)

Family Nurse Practitioner, Pediatric Primary Care Nurse Practitioner, Psychiatric Mental Health Nurse Practitioner, Adult Gerontology Primary Care Nurse Practitioner

The Doctor of Nursing Practice (DNP) program at The University of Toledo (UT) is designed to take BSN prepared nurses to the highest level of clinical practice in order to meet the increasing complexities and challenges of the nation’s healthcare environment. As a DNP student at The University of Toledo you will learn how to:

- Translate and implement nursing research into evidence based practice to provide the best possible outcomes for your population of interest
- Work as an advanced practice nurse in a variety of community and hospital-based practice settings
- Develop the leadership and organizational expertise to effectively enact the policies and procedures necessary to meet the dynamic state of healthcare delivery
- Identify approaches for quality management and performance improvement in health care organizations

The DNP curriculum includes theoretical and clinical courses to prepare students to lead and develop innovative health care delivery in a variety of health care settings. In accordance with AACN specifications for 1000 academically supervised post-BSN clinical hours to earn a DNP degree, 1060 - 1150 hours of academically supervised advanced clinical practice are included in the program.

Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>NURS 7000</td>
<td>BSN-DNP Orientation</td>
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<td>NURS 7050</td>
<td>Inf Tech Nsg &amp; Hlth Care Syst</td>
<td>3</td>
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<tr>
<td>NURS 7400</td>
<td>Theoretical Foundations of Advanced Nursing Practice</td>
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</table>
## Doctor of Nursing Practice: (Post-Master, MSN - DNP)

The Doctor of Nursing Practice (DNP) program at The University of Toledo (UT) is designed to take advanced practice registered nurses and nurse leaders to the highest level of clinical practice in order to meet the increasing complexities and challenges of the nation’s healthcare environment. The online DNP curriculum includes theoretical and clinical courses to prepare students to lead and develop innovative health care delivery in a variety of health care settings. In accordance with AACN specifications for 1000 academically supervised post-BSN clinical hours to earn a DNP degree, 520 hours of academically supervised advanced clinical practice are included in the program. Students are expected to earn a DNP degree.

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>INDI 8000</td>
<td>Introduction to Biostatistical Methods</td>
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<td><strong>Second Term</strong></td>
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<td>NURS 7410</td>
<td>Ethical Foundations of Advanced Nursing Practice</td>
<td>2</td>
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<td>NURS 7060</td>
<td>Population Health</td>
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<td>NURS 7500</td>
<td>Family and Cultural Diversity Theories</td>
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<td>Mktg/Entrep Act Cmplx Hlth Cr</td>
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<td>NURS 7011</td>
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<td>NURS 7020</td>
<td>Org Systems Leadership in Hlth (40 clinical hours)</td>
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<td>NURS 7680</td>
<td>Advanced Physiology and Pathophysiology</td>
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<td><strong>Fourth Term</strong></td>
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<td>Applied Nursing Research</td>
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<td>NURS 7740</td>
<td>Advanced Health Assessment</td>
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<td>NURS 7690</td>
<td>Advanced Pharmacotherapeutics</td>
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<td>NURS 7210</td>
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<td>NURS 7810</td>
<td>Pediatric Nurse Practitioner Clinical I: Care of Children and Concepts of Wellness (180 clinical hours)</td>
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<tr>
<td>NURS 7610</td>
<td>Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adult (180 clinical hours)</td>
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<tr>
<td>NURS 7310</td>
<td>Adult Gerontology Nurse Practitioner Theory and Clinical I: Adolescents and Young Adults (180 clinical hours)</td>
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<td>NURS 7530</td>
<td>Public Policy and Health Care</td>
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<tr>
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<td>NURS 7620</td>
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<td>NURS 7320</td>
<td>Adult Gerontology Nurse Practitioner Theory and Clinical II Adults (180 clinical hours)</td>
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<td>NURS 7090</td>
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<td>NURS 7230</td>
<td>Family Nurse Practitioner Clinical III: Primary Care of Adults and Older Adults (270 clinical hours)</td>
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<td>NURS 7830</td>
<td>Pediatric Nurse Practitioner Clinical III: Complex Chronic Illnesses or Disabilities (180 clinical hours)</td>
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<td>NURS 7630</td>
<td>Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adult (270 clinical hours)</td>
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<td>NURS 7910</td>
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<td><strong>Eighth Term</strong></td>
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<td>NURS 7100</td>
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<td>NURS 7920</td>
<td>Outcomes Methods for Advanced Practice Nurses</td>
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<td>NURS 7080</td>
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<td>NURS 7970</td>
<td>Final Practicum (Direct Care) (240 clinical hours)</td>
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<td>Qual Mgmt/Perf Improve Hlth Or (40 clinical hours)</td>
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<td>Total PPCNP</td>
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## Doctor of Nursing Practice: (Post-Master, MSN - DNP)

The Doctor of Nursing Practice (DNP) program at The University of Toledo (UT) is designed to take advanced practice registered nurses and nurse leaders to the highest level of clinical practice in order to meet the increasing complexities and challenges of the nation’s healthcare environment. The online DNP curriculum includes theoretical and clinical courses to prepare students to lead and develop innovative health care delivery in a variety of health care settings. In accordance with AACN specifications for 1000 academically supervised post-BSN clinical hours to earn a DNP degree, 520 hours of academically supervised advanced clinical practice are included in the program. Students are expected to earn a DNP degree.
to have earned and documented 480 supervised clinical hours in their master's program.

## Curriculum

### First Term

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<tr>
<th>Course</th>
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<tr>
<td>NURS 7010</td>
<td>Scientific Basis Nsg Practice</td>
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<td>NURS 7050</td>
<td>Inf Tech Nsg &amp; Hlth Care Syst</td>
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### Second Term

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<td>NURS 7060</td>
<td>Population Health</td>
<td>3</td>
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</tbody>
</table>

### Third Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 7020</td>
<td>Org Systems Leadership in Hlth (40 clinical hours)</td>
<td>3</td>
</tr>
<tr>
<td>NURS 7090</td>
<td>Project Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

### Fourth Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 7030</td>
<td>Qual Mgmt/Perf Improve Hlth Or (40 clinical hours)</td>
<td>3</td>
</tr>
<tr>
<td>NURS 7070</td>
<td>Mktg/Entrep Act Cmplx Hlth Cr</td>
<td>3</td>
</tr>
</tbody>
</table>

### Fifth Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 7080</td>
<td>Evidence Based Nursing Practice in Direct Care (80 clinical hours) or Evdnc Base Admin Comp Hlth Sys</td>
<td>3</td>
</tr>
<tr>
<td>NURS 7100</td>
<td>Doctoral Project</td>
<td>3</td>
</tr>
</tbody>
</table>

### Sixth Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 7970</td>
<td>Final Practicum (Direct Care) (360 clinical hours) or Final Practicum (Indirect Care)</td>
<td>6</td>
</tr>
</tbody>
</table>

### Total Hours

36

1. Graduate statistics course with a minimum grade of B within 5 years of enrollment in NURS 7040 and NURS 7060

## Graduate Certificate: Family Nurse Practitioner

The Family Nurse Practitioner Graduate Certificate program is offered to individuals who have completed a master's degree in nursing and who desire to obtain specialized knowledge to seek certification as an FNP. Graduates of the program will be qualified to take national FNP certification examinations.

The program is offered in a four-semester, part-time option. The curriculum is designed to prepare professional nurses for the FNP role in primary nursing care. The curriculum includes 630 contact hours for clinical practice.

## Curriculum

### First Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 5680</td>
<td>Advanced Physiology and Pathophysiology (Prerequisite)</td>
<td>3</td>
</tr>
<tr>
<td>NURS 5740</td>
<td>Advanced Health Assessments (60 lab hours) (Prerequisite)</td>
<td>3</td>
</tr>
</tbody>
</table>

### Second Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 5690</td>
<td>Adv Pharmacotherapeutics</td>
<td>3</td>
</tr>
</tbody>
</table>

### Third Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 6210</td>
<td>FNP Clin I:Adolescent and Adult (180 clinical hours)</td>
<td>7</td>
</tr>
</tbody>
</table>

### Fourth Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 6220</td>
<td>FNP Clin II:Women and Children (180 clinical hours)</td>
<td>7</td>
</tr>
</tbody>
</table>

### Fifth Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 6230</td>
<td>FNP Clin III:Adults/Older Adul (270 clinical hours)</td>
<td>8</td>
</tr>
</tbody>
</table>

### Total Hours

25

1. If the course was completed greater than 5 years prior to matriculation, the course must be repeated.

## Graduate Certificate: Nurse Educator

The Nurse Educator certificate is target for baccalaureate-prepared nurses to gain core knowledge and application in the principles of teaching and learning, program development, evaluation of learners and nurse educator role development. The certificate is designed to prepare students with education-focused knowledge in beginning or continuing roles as a nurse educator in academic, community, or health care settings.

### First Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 6720</td>
<td>Tchg, Lrng and Evaluation Nurs</td>
<td>4</td>
</tr>
</tbody>
</table>

### Second Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 6710</td>
<td>Develop Instruc Progrm Nursing</td>
<td>3</td>
</tr>
</tbody>
</table>

### Third Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 6730</td>
<td>Practicum/Seminar in Teaching (135 clinical hours)</td>
<td>4</td>
</tr>
</tbody>
</table>

### Total Hours

11
Graduate Certificate: Pediatric Primary Care Nurse Practitioner

The Pediatric Primary Care Nurse Practitioner Graduate Certificate (PPCNP) program is offered to individuals who have completed a master’s degree in nursing and who desire to obtain specialized knowledge to seek certification as a PPCNP. All of the courses award academic credit from The University of Toledo. Graduates of the program will be qualified to take national PPCNP certification examinations. The curriculum includes 540 contact hours for clinical practice.

Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Term</td>
<td>NURS 5680 Advanced Physiology and Pathophysiology (Prerequisite) 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NURS 5740 Advanced Health Assessments (60 lab hours) (Prerequisite) 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>NURS 6730 has 135 practicum hours in faculty-approved locale.</strong></td>
<td></td>
</tr>
<tr>
<td>Second Term</td>
<td>NURS 5690 Adv Pharmacotherapeutics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>NURS 5810 PNP I: Care of Children - Well (180 clinical hours; offered odd years only)</td>
<td>6</td>
</tr>
<tr>
<td>Third Term</td>
<td>NURS 5820 PNP Clin II: Acute/Chronic (180 clinical hours; offered odd years only)</td>
<td>6</td>
</tr>
<tr>
<td>Fourth Term</td>
<td>NURS 5830 PNP Clinical III: Complex (180 clinical hours; offered even years only)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td><strong>If the course was completed greater than 5 years prior to matriculation, the course must be repeated.</strong></td>
<td></td>
</tr>
</tbody>
</table>

MS in Nursing: Adult Gerontology Nurse Practitioner

The Adult Gerontology Nurse Practitioner (AGNP) major is a two-year, full-time course of study with part-time options. The curriculum is designed to prepare professional nurses for the adult gerontology role in primary nursing care. The curriculum features theoretically based and clinically focused courses and includes 630 contact hours for clinical practice and 120 contact hours for selective laboratory experiences.

Curriculum

Sample Full-time Plan of Study

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Term</td>
<td>NURS 5400 Theoretical and Ethical Found</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>NURS 5680 Advanced Physiology and Pathophysiology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>NURS 5740 Advanced Health Assessments (60 lab hours)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>INDI 6000 Introduction to Biostatistical Methods</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>PUBLIC POLICY AND HEALTH CARE</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>NURS 6140 Adv Pharmacotherapeutics</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>ADVANCED NURSING RESEARCH</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>ADVANCED NURSING INTERVENTIONS (60 lab hours)</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL HOURS</strong></td>
<td>55</td>
</tr>
</tbody>
</table>

MS in Nursing: Family Nurse Practitioner

The Family Nurse Practitioner (FNP) major is a two-year, full-time course of study with part-time options. The curriculum is designed to prepare professional nurses for the FNP role in primary nursing care. The curriculum features theoretically based and clinically focused courses and includes 630 contact hours for clinical practice and 120 contact hours for selected laboratory experiences.

Curriculum

Sample Full-time Plan of Study

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Term</td>
<td>NURS 5400 Theoretical and Ethical Found</td>
<td>3</td>
</tr>
</tbody>
</table>
### MS in Nursing: Graduate Entry Clinical Nurse Leader

The Graduate Entry Clinical Nurse Leader (CNL) major is a two-year, full-time course of study. The program is designed for the person who holds a bachelor's degree, who is not yet a registered nurse (RN), but who desires to become a RN. The curriculum includes theory classes prepared by the graduate faculty of the University of Toledo College of Nursing, as well as clinical experiences with patients in state-of-the-art health care facilities. The master's preparation positions graduates for immediate entry into exciting positions in hospitals or clinics, and also provides an opportunity to continue graduate study. Graduates may elect to pursue a certificate to enter advanced practice roles as a nurse practitioner or clinical nurse specialist, or they may decide to pursue a Doctor of Nursing Practice (DNP) degree or the Doctor of Philosophy (Ph.D.) degree.

#### Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First Term</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60 Total Clinical Hours/60 Total Lab Hours</td>
<td></td>
</tr>
<tr>
<td>NURS 5040</td>
<td>Hlth Assess and Nrs Prmng Hlth (30 clinical hours/60 lab hours)</td>
<td>6</td>
</tr>
</tbody>
</table>

### MS in Nursing: Nurse Educator

The Nurse Educator major targets baccalaureate-prepared nurses who aspire to a career as a professional nurse educator. Graduates are prepared to enter roles as beginning faculty members in academic settings, as educators in the community or as professional educators in a variety of health care settings and systems. The curriculum focuses on principles of teaching, learning and evaluation, role development and courses pertinent to a master's prepared nurse educator. Students who are seeking full time study should matriculate in the Spring Semester. Campus and community experiences are scheduled, including 60 contact hours for selective laboratory experiences and a 135 contact hour practicum focused on hands-on experience with an expert faculty preceptor at selected times in the course schedule.

#### Curriculum

Sample Full-time Plan of Study
### MS in Nursing: Pediatric Primary Care Nurse Practitioner

The Pediatric Primary Care Nurse Practitioner major is a two-year, full-time course of study with part-time options. The program is designed to prepare advanced practice nurses to care for children in a wide variety of settings. The curriculum features theoretically based and clinically focused courses and includes 540 contact hours for clinical practice and 120 contact hours for selected laboratory experiences. Students who desire full-time study should matriculate in fall of even numbered years.

#### Curriculum

**Sample Full-time Plan of Study**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NURS 5400</td>
<td>Theoretical and Ethical Found</td>
<td>3</td>
</tr>
<tr>
<td>NURS 5680</td>
<td>Advanced Physiology and Pathophysiology</td>
<td>3</td>
</tr>
<tr>
<td>NURS 5740</td>
<td>Advanced Health Assessments (60 lab hours)</td>
<td>4</td>
</tr>
<tr>
<td>INDI 6000</td>
<td>Introduction to Biostatistical Methods</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td><strong>Second Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NURS 5610</td>
<td>Adv Pharmacotherapeutics</td>
<td>3</td>
</tr>
<tr>
<td>NURS 5810</td>
<td>PNP: Care of Children - Well (180 clinical hours; offered odd years only)</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td><strong>Third Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NURS 5510</td>
<td>Adv Clinical Seminar:Nursing (60 lab hours)</td>
<td>4</td>
</tr>
<tr>
<td>NURS 6730</td>
<td>Practicum/Seminar in Teaching (135 practicum hours)</td>
<td>4</td>
</tr>
<tr>
<td>NURS XXX</td>
<td>Capstone: Field experience, thesis or comprehensive exam</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td><strong>Fourth Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NURS 5530</td>
<td>Public Policy and Health Care</td>
<td>3</td>
</tr>
<tr>
<td>NURS 5830</td>
<td>PNP Clinical III: Complex (180 clinical hours; offered even years only)</td>
<td>6</td>
</tr>
<tr>
<td>NURS 6140</td>
<td>Adv Pract Nursing: Role and Issue</td>
<td>2</td>
</tr>
<tr>
<td>NURS XXX</td>
<td>Capstone: Field Experience, Thesis or Comprehensive Exam</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>14</td>
</tr>
</tbody>
</table>

1. NURS 6710 and NURS 6720 must be taken prior to NURS 6730.
2. NURS 6730 has 135 practicum hours in faculty-approved locale.

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### MS in Nursing: Psychiatric Mental Health Nurse Practitioner

The Psychiatric Mental Health Nurse Practitioner major is a two-year, full-time course of study with part-time options. The curriculum is designed to prepare advanced practice nurses to care for families in a wide variety of community and hospital based psychiatric settings. The curriculum features theoretically based and clinically focused courses and includes 630 contact hours for clinical practice and 120 contact hours for selective laboratory experiences.

#### Curriculum

**Sample Full-time Plan of Study**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NURS 5400</td>
<td>Theoretical and Ethical Found</td>
<td>3</td>
</tr>
<tr>
<td>NURS 5680</td>
<td>Advanced Physiology and Pathophysiology</td>
<td>3</td>
</tr>
<tr>
<td>NURS 5740</td>
<td>Advanced Health Assessments (60 lab hours)</td>
<td>4</td>
</tr>
<tr>
<td>INDI 6000</td>
<td>Introduction to Biostatistical Methods</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td><strong>Second Term</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NURS 5530</td>
<td>Public Policy and Health Care</td>
<td>3</td>
</tr>
<tr>
<td>NURS 5690</td>
<td>Adv Pharmacotherapeutics</td>
<td>3</td>
</tr>
<tr>
<td>NURS 5910</td>
<td>Advanced Nursing Research</td>
<td>3</td>
</tr>
<tr>
<td>NURS 5190</td>
<td>Adv Interpersonal Intervention (60 lab hours)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>12</td>
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</table>
### Third Term

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 5610</td>
<td>Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adults (180 clinical hours)</td>
<td>7</td>
</tr>
</tbody>
</table>

### Fourth Term

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 5500</td>
<td>Family and Cultural Diversity</td>
<td>3</td>
</tr>
<tr>
<td>NURS 6140</td>
<td>Adv Pract Nurs: Role and Issue</td>
<td>2</td>
</tr>
<tr>
<td>NURS 5620</td>
<td>Psychiatric-Mental Health Nurse Practitioner Theory and Clinical II Child, Adolescent, Family (180 clinical hours)</td>
<td>7</td>
</tr>
</tbody>
</table>

### Fifth Term

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NURS 5630</td>
<td>Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adults (270 clinical hours)</td>
<td>9</td>
</tr>
<tr>
<td>NURS XXX</td>
<td>Capstone: Field Experience, Thesis or Comprehensive Exam</td>
<td>3</td>
</tr>
</tbody>
</table>

### Total Hours

- **Total Hours:** 56

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### Graduate Degrees/Certificates Offered

#### Doctor of Nursing Programs

- Doctor of Nursing Practice (Post Baccalaureate, BSN-DNP) (p. 273)
  - Family Nurse Practitioner (FNP) (89 semester credits) (p. 273)
  - Pediatric Primary Care Nurse Practitioner (PPCNP) (85 semester credits) (p. 273)
  - Psychiatric Mental Health Nurse Practitioner (90 semester credits) (p. 273)
  - Adult Gerontology Primary Care Nurse Practitioner (89 semester credits) (p. 273)
  - Doctor of Nursing Practice (Post Masters, MSN-DNP) (36 semester credits) (p. 274)

#### Master of Science Programs

- MS in Nursing: Adult Gerontology Primary Care Nurse Practitioner (55 semester credits) (p. 276)
- MS in Nursing: Family Nurse Practitioner (FNP) (55 semester credits) (p. 276)
- MS in Nursing: Graduate Entry Clinical Nurse Leader (66 semester credits) (p. 277)
- MS in Nursing: Nurse Educator (39 semester credits) (p. 277)
- MS in Nursing: Pediatric Primary Care Nurse Practitioner (PPCNP) (51 semester credits) (p. 278)
- MS in Nursing: Psychiatric Mental Health Nurse Practitioner (56 semester credits) (p. 278)

#### Certificate Programs

For Current Registered Nurses with a Bachelor’s or Master’s Degree in Nursing:

- Nursing Education Certificate (11 semester credits) (p. 276)

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*University of Toledo*
College of Pharmacy & Pharmaceutical Sciences

2018-2019 Graduate Catalog

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.

Dr. Marcia McInerney

Executive Administrative Dean of the College of Pharmacy and Pharmaceutical Sciences
Associate Dean for Research and Graduate Programs (25% protected time for research)
Distinguished University Professor
Medicinal and Biological Chemistry

Frederic and Mary Wolfe Center 145F, MS1013
Toledo, OH 43614-5804
E-Mail: marcia.mcinerney@utoledo.edu

Mission: The mission of the Office of the Associate Dean for Research and Graduate Studies is to provide services to the faculty, programs and departments in following areas:

- Research Program Development
- Graduate Program Development
- Proposal Development
- Industrial Liaisons
- Technology Transfer

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)
- 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)
- U.S. Patent Databases (http://www.uspto.gov/patft)

College Policies (Graduate Handbook)

COGS Graduate Student Handbook (http://www.utoledo.edu/graduate/files/Graduate%20Student%20Handbook%202015-2016.pdf)
- College Policies and Procedures (p. 392)
- Academic Regulations (p. 394)
- Other Policies and Information (p. 399)

Departments/Programs

- Combined Pharm.D. – Ph.D. in Medicinal Chemistry Program (p. 280)
- Department of Medicinal and Biological Chemistry (p. 281)
- Department of Pharmacology (p. 285)
- Department of Pharmacy Practice (p. 290)

Combined Pharm.D. – Ph.D. in Medicinal Chemistry Program

Students who are admitted to both programs separately may pursue both degrees concomitantly.

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 four to four 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, plus the two-hour seminar, 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 four to four 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, plus the two-hour seminar, 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. The Ph.D. requirement for MBC 6550 (Biochemistry) may be waived. 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

Degrees Offered

- MS in Medicinal Chemistry (p. 282)
- PhD in Medicinal Chemistry (p. 284)

MBC 5100 Ethical Conduct Research
[1 credit hour (1, 0, 0)]
Consideration of the scientific, ethical and legal obligations of the graduate student researcher.
Term Offered: Spring, Summer

MBC 5300 Molecular Basis of Cancer Chemotherapy
[1 credit hour (1, 0, 0)]
Discussion of molecular properties and mechanisms of action that form the basis of current and emergent cancer chemotherapies.
Corequisites: PHPR 5300
Term Offered: Fall

MBC 5380 Medicinal And Poisonous Plants
[3 credit hours (3, 0, 0)]
Lecture/field course examining medicinal and harmful properties of herbs and plants using pharmacognosy, clinical trials and local plant examples.
Term Offered: Summer

MBC 5620 Biochemical Techniques
[2 credit hours (2, 0, 0)]
A detailed study of biochemical laboratory techniques necessary for the development of novel therapeutics, including bioassays and data analysis.
Term Offered: Fall

MBC 5900 Medicinal Chemistry Seminar
[1 credit hour (1, 0, 0)]
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 (2, 0, 0)]
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 (4, 0, 0)]
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 Biomedical Chemistry
[4 credit hours (4, 0, 0)]
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
Term Offered: Spring

MBC 6300 Biomedical Chemistry Laboratory I
[1 credit hour (0, 1, 0)]
Experimental research problems in biomedical chemistry.
Prerequisites: (MBC 6190 and MBC 6550)
Term Offered: Spring, Fall

MBC 6310 Biomedical Chemistry Laboratory II
[3 credit hours (0, 3, 0)]
Additional experimental research problems in biomedical chemistry (see MBC 6300/8300).
Prerequisites: (MBC 6190 and MBC 6550)
Term Offered: Spring, Summer, Fall

MBC 6320 NEUROLOGICAL AND PSYCHIATRIC DRUGS
[1 credit hour (1, 0, 0)]
A course analyzing the chemical and mechanistic basis for the modulation of neurologically based attributes and disorders.
Corequisites: PHCL 6320, PHPR 6140
Term Offered: Spring

MBC 6420 Protein Chemistry
[4 credit hours (4, 0, 0)]
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: MBC 6550

MBC 6430 Nucleic Acid Chemistry
[4 credit hours (4, 0, 0)]
The chemical basis for storage and transmission of genetic information.
Prerequisites: MBC 6550

MBC 6440 Enzymology
[4 credit hours (4, 0, 0)]
The principles of chemical catalysis applied to molecular enzymology.

MBC 6450 Advanced Synthetic and Medicinal Chemistry
[2 credit hours (0, 0, 2)]
Readings in and critical analysis of recent literature in synthetic and medicinal chemistry research.
Term Offered: Spring, Fall

MBC 6550 Biochemistry
[4 credit hours (4, 0, 0)]
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 (0, 0-45, 0)]
Development and pursuit of research leading to an M.S. thesis in medicinal chemistry.
Term Offered: Spring, Summer, Fall
MBC 6980 Special Topics In Biomedical Chemistry
[1-5 credit hours (0-15, 0, 0)]
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 (1, 0, 0)]
Consideration of the scientific, ethical and legal obligations of the graduate student researcher.
Term Offered: Spring, Summer

MBC 7620 Biochemical Techniques
[2 credit hours (2, 0, 0)]
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 (1, 0, 0)]
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 (2, 0, 0)]
Readings in and critical analysis of the recent literature in immunology and basic immunologic responses, especially as considered in immunotherapy.
Term Offered: Spring, Summer, Fall

MBC 8190 Advanced Medicinal Chemistry
[4 credit hours (4, 0, 0)]
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 Biomedical Chemistry
[4 credit hours (4, 0, 0)]
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
Term Offered: Spring

MBC 8300 Biomedical Chemistry Laboratory I
[1 credit hour (0, 1, 0)]
Experimental research problems in biomedical chemistry.
Prerequisites: (MBC 6190 and MBC 8550)
Term Offered: Spring, Fall

MBC 8310 Biomedical Chemistry Laboratory II
[3 credit hours (0, 3, 0)]
Additional experimental research problems in biomedical chemistry (see MBC 6300/8300).
Prerequisites: (MBC 6190 and MBC 8550)
Term Offered: Spring, Summer, Fall

MBC 8420 Protein Chemistry
[4 credit hours (4, 0, 0)]
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.

MBC 8430 Nucleic Acid Chemistry
[4 credit hours (4, 0, 0)]
The chemical basis for storage and transmission of genetic information.

MBC 8440 Enzymology
[4 credit hours (4, 0, 0)]
The principles of chemical catalysis applied to molecular enzymology.

MBC 8450 Advanced Synthetic and Medicinal Chemistry
[2 credit hours (0, 0, 2)]
Readings in and critical analysis of recent literature in synthetic and medicinal chemistry research.
Term Offered: Spring

MBC 8550 Biochemistry
[4 credit hours (4, 0, 0)]
A consideration of the structure and function of biological macromolecules as well as the basic and regulated metabolism of cells.

MBC 8960 Ph.d. Dissertation Research In Medicinal Chemistry
[1-15 credit hours (0-45, 0, 0)]
Development and pursuit of research leading to a Ph.D. dissertation in medicinal chemistry.
Term Offered: Spring, Summer, Fall

MBC 8980 Special Topics In Biomedical Chemistry
[1-5 credit hours (0-15, 0, 0)]
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. It is assumed 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 admission requirements of the College of Graduate Studies of the University apply.

Medicinal and Biological Chemistry (MBC) Major & Master of Science (M.S.) in Medicinal Chemistry (MC) Option

Students need to meet the requirements for entry into the Bachelor of Science of Pharmaceutical Science (BSPS) program. At the beginning of the second semester of their P1 year (spring semester, third year of study) the student applies for provisional acceptance into the graduate program and identifies an MBC faculty mentor for an in-house internship to be taken during the summer between the P1 and P2 year. Once the
BSPS degree is awarded the student will be fully accepted into the graduate program. The internship mentor will become the graduate advisor of the student.

Master’s students need to complete the following courses as partial fulfillment of their requirement for an M.S. degree:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBC 5100</td>
<td>Ethical Conduct Research</td>
<td>1</td>
</tr>
<tr>
<td>MBC 5900</td>
<td>Medicinal Chemistry Seminar ¹</td>
<td>3-4</td>
</tr>
<tr>
<td>MBC 6190</td>
<td>Advanced Medicinal Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>MBC 6960</td>
<td>M.S. Thesis Research In Medicinal Chemistry ²</td>
<td>6-16</td>
</tr>
</tbody>
</table>

Electives ³ 5

Total Hours 19-30

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.

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

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First Term</td>
<td></td>
</tr>
<tr>
<td>MBC 3310</td>
<td>Medicinal Chemistry I: Drug Action And Design</td>
<td>2</td>
</tr>
<tr>
<td>MBC 3330</td>
<td>Techniques in Pharmaceutical and Medicinal Chemistry</td>
<td>2</td>
</tr>
<tr>
<td>MBC 3340</td>
<td>Techniques in Pharmaceutical and Medicinal Chemistry Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>PHCL 3700</td>
<td>PHARMACOLOGY I: PRINCIPLES OF PHARMACOLOGY, AUTONOMIC PHARMACOLOGY AND RELATED PHARMACOLOGY</td>
<td>3</td>
</tr>
<tr>
<td>MBC 3550</td>
<td>Physiological Chemistry I: Structure And Function Of Biological Macromolecules</td>
<td>3</td>
</tr>
</tbody>
</table>

| 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBC 3100</td>
<td>Practices in Pharmaceutical Research</td>
<td>1</td>
</tr>
<tr>
<td>MBC 3320</td>
<td>Medicinal Chemistry II: Drug Design and Drug Action</td>
<td>3</td>
</tr>
<tr>
<td>MBC 3560</td>
<td>Physiological Chemistry II: Chemical Regulation Of Cells And Organisms</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 3730</td>
<td>BSPS Pharmacology II: Endocrine and CNS Pharmacology</td>
<td>3</td>
</tr>
<tr>
<td>MBC 3880</td>
<td>Medicinal And Biological Chemistry Laboratory (Recommend MBC Laboratory course) ¹</td>
<td>3</td>
</tr>
<tr>
<td>MBC 3100</td>
<td>Practices in Pharmaceutical Research (Recommend Major Elective) ²</td>
<td>1</td>
</tr>
<tr>
<td>MBC 4870</td>
<td>Biomedical Chemistry Laboratory (Recommend Major Elective) ²</td>
<td>1-4</td>
</tr>
</tbody>
</table>

| Hours | 15-18 |

| Third Term |

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBC 4780</td>
<td>Internship in Medicinal Chemistry ³</td>
<td>6-12</td>
</tr>
</tbody>
</table>

| Hours | 6-12 |

| Fourth Term |

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBC 4710</td>
<td>Targeted Drug Design ⁴</td>
<td>3</td>
</tr>
<tr>
<td>MBC 4850</td>
<td>Advanced Immunology And Tissue Culture Laboratory (Recommend Major Elective) ²</td>
<td>1-10</td>
</tr>
</tbody>
</table>

Recommended MBC4880 Laboratory or select a major elective

| Hours | 7-16 |

| Total Hours | 41-59 |
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 be admitted directly to the Ph.D. program. For students entering the Medicinal Chemistry PhD program who have an MS in Medicinal Chemistry, the department will review the prior graduate coursework and may allow up to 30 credit hours towards the 90 credits needed for the Ph.D. Allowance toward requirements for teaching assistant experience and elective credits will also be considered in the evaluation. 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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBC 5100/7100</td>
<td>Ethical Conduct Research</td>
<td>1</td>
</tr>
<tr>
<td>MBC 5900/7900</td>
<td>Medicinal Chemistry Seminar ((6-8 hours, 1 each semester))</td>
<td>1</td>
</tr>
<tr>
<td>MBC 6190/8190</td>
<td>Advanced Medicinal Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>MBC 6200/8200</td>
<td>Biomedicalical Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>MBC 6300/8300</td>
<td>Biomedicalical Chemistry Laboratory I</td>
<td>1</td>
</tr>
<tr>
<td>MBC 6310/8310</td>
<td>Biomedicalical Chemistry Laboratory II</td>
<td>3</td>
</tr>
<tr>
<td>MBC 6550/8550</td>
<td>Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>MBC 8960</td>
<td>Ph.d. Dissertation Research In Medicinal Chemistry (minimum of 30 hours)</td>
<td>1-15</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 6330</td>
<td>Spectroscopic Methods And Analysis Of Spectra</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 6400/8400</td>
<td>Advanced Organic Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 6410/8410</td>
<td>Organic Synthesis</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 6510/8510</td>
<td>Protein Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 6520/8520</td>
<td>Enzymology</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 6530/8530</td>
<td>Nucleic Acid Chemistry</td>
<td>4</td>
</tr>
</tbody>
</table>

Biology Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 6010/8010</td>
<td>Advanced Molecular Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 6020</td>
<td>Advanced Molecular Biology Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>BIOL 6090/8090</td>
<td>Advanced Cell Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 6100/8100</td>
<td>Research Methodology. Cell And Molecular Biology</td>
<td>3</td>
</tr>
</tbody>
</table>

Medicinal and Biological Chemistry Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBC 5380</td>
<td>Medicinal And Poisonous Plants</td>
<td>3</td>
</tr>
<tr>
<td>MBC 6100/8100</td>
<td>Advanced Immunology</td>
<td>2</td>
</tr>
<tr>
<td>MBC 6450/8450</td>
<td>Advanced Synthetic and Medicinal Chemistry</td>
<td>2</td>
</tr>
</tbody>
</table>

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.
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.

Department of Pharmacology

Degrees Offered

- M.S. in Pharmacology and Toxicology (p. 287)
- PhD in Experimental Therapeutics (p. 289)

PHCL 5100 Experimental Therapeutics I
[3 credit hours (3, 0, 0)]
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 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 5140 Interpretation Of Pharmaceutical Data
[2 credit hours (2, 0, 0)]
A course designed to emphasize the presentation, analysis and interpretation of data in the pharmaceutical sciences. The concepts of statistics will be discussed. Experimental design as well as appropriateness of analytical methodology and conclusions will be emphasized.
Term Offered: Summer

PHCL 5200 Experimental Therapeutics II
[3 credit hours (3, 0, 0)]
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
Term Offered: Summer

PHCL 5440 Current Topics in Interpretation of Pharmaceutical Data
[1 credit hour (1, 0, 0)]
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)
Term Offered: Summer

PHCL 5460 Current Topics in Pharmacokinetics Toxicokinetics
[1 credit hour (1, 0, 0)]
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 or PHCL 5760 (may be taken concurrently)
Term Offered: Spring, Fall

PHCL 5500 From Experimental to Applied Therapeutics
[4 credit hours (0, 0, 4)]
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 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 5700 Pharmacology I -Principles Of Pharmacology, Autonomic Pharmacology And Non-steroidal Anti-inflammat
[3 credit hours (3, 0, 0)]
An introduction to the principles of pharmacology and the pharmacology of the autonomic system. Non-steroidal anti inflammatory agents are also discussed.
Term Offered: Fall
PHCL 5720 Pharmacology II: Endocrine And Cns Pharmacology
[3 credit hours (3, 0, 0)]
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 or PHCL 5700
Term Offered: Spring

PHCL 5730 Toxicology I
[3 credit hours (3, 0, 0)]
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.
Prerequisites: PHCL 3700 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 5750 Toxicology II
[3 credit hours (3, 0, 0)]
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 or PHCL 5700
Term Offered: Spring

PHCL 5760 Toxicokinetics
[3 credit hours (3, 0, 0)]
The theory and practice of using kinetic principles to model the time course of toxic chemicals in the body and in the environment. Relation of the chemical time course to negative outcomes and application to risk assessment. Hands-on practice with kinetic analysis methods and software.
Term Offered: Summer, Fall

PHCL 5770 Current Topics in Toxicology I
[1 credit hour (0, 0, 1)]
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 or PHCL 5730 (may be taken concurrently)
Term Offered: Fall

PHCL 5990 Problems In Pharmacology
[1-6 credit hours (0, 0, 1)]
Tutorial or directed individual research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 6300 Research Experience in Experimental Therapeutics
[2-6 credit hours (2-6, 2-6, 2-6)]
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 (1, 0, 0)]
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 (0, 0, 1-6)]
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 6600 Seminar In Pharmacology
[1 credit hour (0, 0, 1)]
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 (0, 0, 2)]
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 (3, 0, 0)]
The pharmacology of central nervous system active agents. Agents acting on the cardiovascular and renal systems are discussed.
Prerequisites: PHCL 3700 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 6720 Pharmacology IV; Chemotherapeutics
[3 credit hours (3, 0, 0)]
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 or PHCL 5700
Term Offered: Spring
PHCL 6900 M.s. Thesis Research In Pharmacology
[1-6 credit hours (0-6, 0, 0)]
M.S. thesis research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 6920 M.s. Thesis Research In Pharmacology
[1-6 credit hours (0-6, 0, 0)]
M.S. thesis research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 7100 Experimental Therapeutics I
[3 credit hours (3, 0, 0)]
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 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 7200 Experimental Therapeutics II
[3 credit hours (3, 0, 0)]
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 or PHCL 7100
Term Offered: Spring

PHCL 7440 Current Topics in Interpretation of Pharmaceutical Data
[1 credit hour (1, 0, 0)]
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)
Term Offered: Summer

PHCL 7460 Current Topics in Pharmacokinetics Toxicokinetics
[1 credit hour (1, 0, 0)]
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 or PHCL 5760 (may be taken concurrently)
Term Offered: Spring, Fall

PHCL 7500 From Experimental to Applied Therapeutics
[4 credit hours (0, 0, 4)]
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 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 7770 Current Topics in Toxicology I
[1 credit hour (0, 0, 1)]
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 or PHCL 5730 (may be taken concurrently)
Term Offered: Fall

PHCL 8300 Research Experience in Experimental
[2-6 credit hours (2-6, 2-6, 2-6)]
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 (0, 0, 1-6)]
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 (0, 0, 2)]
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 (0, 1-15)]
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 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 socioeconomic sciences, 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 socioeconomic sciences 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, and scores from the aptitude portion of the GRE.

International students are required to take the TOEFL, 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 28 semester hours of courses plus a minimum of 6 thesis credit hours are required for the degree.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 3710</td>
<td>Physical Chemistry For The Biosciences I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 3720</td>
<td>Physical Chemistry For The Biosciences II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1750</td>
<td>Calculus For The Life Sciences With Applications I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1760</td>
<td>Calculus For The Life Sciences With Applications II</td>
<td>3</td>
</tr>
<tr>
<td>MBC 3310</td>
<td>Medicinal Chemistry I: Drug Action And Design</td>
<td>2</td>
</tr>
<tr>
<td>MBC 3320</td>
<td>Medicinal Chemistry II: Drug Design and Drug Action</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 2610</td>
<td>Introductory Physiology</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5140</td>
<td>Interpretation Of Pharmaceutical Data</td>
<td>2</td>
</tr>
<tr>
<td>PHCL 5700</td>
<td>Pharmacology I -Principles Of Pharmacology, Autonomic Pharmacology And Non-steroidal Anti-inflammation</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5720</td>
<td>Pharmacology II: Endocrine And Cns Pharmacology</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5730</td>
<td>Toxicology I</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5760</td>
<td>Toxicokinetics</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 6600</td>
<td>Seminar In Pharmacology 1</td>
<td>1</td>
</tr>
<tr>
<td>PHCL 6700</td>
<td>Pharmacology III: Cns And Cardiovascular/Renal Pharmacology</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 6720</td>
<td>Pharmacology IV; Chemotherapeutics</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 6900</td>
<td>M.s. Thesis Research In Pharmacology 2</td>
<td>1-6</td>
</tr>
<tr>
<td>PHCL 6920</td>
<td>M.s. Thesis Research In Pharmacology 2</td>
<td>1-6</td>
</tr>
</tbody>
</table>

**Elective Course Work**

Select up to six credits of the following:

- PHCL 5750 Toxicology II
- PHCL 5990 Problems In Pharmacology
- MBC 6100 Advanced Immunology
- MBC 6550 Biochemistry
- MBC 5620 Biochemical Techniques

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.

**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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHCL 5700</td>
<td>Pharmacology I - Principles Of Pharmacology, Autonomic Pharmacology And Non-steroidal Anti-inflammation</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5720</td>
<td>Pharmacology II: Endocrine And CNS Pharmacology</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5730</td>
<td>Toxicology I</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 6700</td>
<td>Pharmacology III: CNS And Cardiovascular/Renal Pharmacology</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

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 with regulatory compliance (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 where the student can concentrate on regulatory compliance of chemicals, drug and health products. 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.).

**PhD in Experimental Therapeutics**

Experimental therapeutics is the integration of basic and applied sciences focused on the study and development of new treatments for human disease. Research in experimental therapeutics seeks to understand human diseases from the molecular level to the whole organism in order to develop rational approaches for new pharmacological treatments. In addition, experimental therapeutics includes the development of new therapies through systematic investigation at increasing levels of complexity ranging from individual molecules and proteins, to cellular and tissue based assays and to the whole organism. The purpose of the program is to train students at the doctoral level who can translate discoveries in the laboratory to therapies in a clinical setting.

Satisfactory completion of a bachelor’s degree in chemistry, biology, pharmaceutical sciences, pharmacy or a related discipline is required.

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 pharmacology or related fields (e.g., pharmaceutical sciences) may be also admitted to the program. However, they are expected to have a minimum of 30 credits at the Master’s level prior to accruing doctoral level credits.

Ph.D. students need to complete the following required courses at the 5000 to 8000 level as partial fulfillment of the requirements for a Ph.D. degree. The course level is determined by the number of graduate credits completed at the time of registering for that particular course.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHCL 5700</td>
<td>Pharmacology I - Principles Of Pharmacology, Autonomic Pharmacology And Non-steroidal Anti-inflammation</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5100/7100</td>
<td>Experimental Therapeutics I</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5200/7200</td>
<td>Experimental Therapeutics II</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5770/7770</td>
<td>Current Topics in Toxicology I ²</td>
<td>1</td>
</tr>
<tr>
<td>PHCL 6650/8650</td>
<td>Seminar in Experimental Therapeutics (Minimum 6 hours required)</td>
<td>2</td>
</tr>
<tr>
<td>PHCL 5460/7460</td>
<td>Current Topics in Pharmacokinetics Toxicokinetics</td>
<td>1</td>
</tr>
<tr>
<td>PHCL 5440/7440</td>
<td>Current Topics in Interpretation of Pharmaceutical Data ⁴</td>
<td>1</td>
</tr>
<tr>
<td>PHCL 6300/8300</td>
<td>Research Experience in Experimental Therapeutics ⁵</td>
<td>2-6</td>
</tr>
<tr>
<td>PHCL 8960</td>
<td>Dissertation Research in Experimental Therapeutics ⁶</td>
<td>1-15</td>
</tr>
<tr>
<td>MBC 6190/8190 or PHCL 5500/7500</td>
<td>Advanced Medicinal Chemistry From Experimental to Applied Therapeutics</td>
<td>4</td>
</tr>
<tr>
<td>INDI 6020/8020</td>
<td>On Being a Scientist</td>
<td>1</td>
</tr>
</tbody>
</table>

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 4760 or PHCL 5760 as pre-requisite or PHCL 5760 as co-requisite. If PHCL 5760 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 5140 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.

**General Elective Courses**

In addition to the required courses, general elective courses may be selected from the following. The course level to be taken is dependent on the number of graduate credits earned at the time of registration for that particular course:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHCL 5750</td>
<td>Toxicology II</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5990</td>
<td>Problems In Pharmacology</td>
<td>1-6</td>
</tr>
<tr>
<td>PHCL 6390/8390</td>
<td>Problems in Experimental Therapeutics</td>
<td>1-6</td>
</tr>
<tr>
<td>MBC 5620/7620</td>
<td>Biochemical Techniques</td>
<td>2</td>
</tr>
<tr>
<td>MBC 5380</td>
<td>Medicinal And Poisonous Plants</td>
<td>3</td>
</tr>
<tr>
<td>MBC 6100/8100</td>
<td>Advanced Immunology</td>
<td>2</td>
</tr>
<tr>
<td>MBC 6550/8550</td>
<td>Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 6510/8510</td>
<td>Protein Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 6520/8520</td>
<td>Enzymology</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 6530/8530</td>
<td>Nucleic Acid Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 6010/8010</td>
<td>Advanced Molecular Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 6090/8090</td>
<td>Advanced Cell Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 6100/8100</td>
<td>Research Methodology: Cell And Molecular Biology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Specialized Elective Courses**

Specialized elective courses are recommended for students with concentrations in different areas of the program, and may be selected from the following list:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMSP 6340/8340</td>
<td>Curr Prob Res App Genes/Genom</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 6330/8330</td>
<td>Curr Prob Res App Protein Str</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 6340/8340</td>
<td>Curr Prob Res App Genes/Genom</td>
<td>2.5</td>
</tr>
<tr>
<td>BMSP 6360/8360</td>
<td>Curr Prob Cell Membranes</td>
<td>3</td>
</tr>
<tr>
<td>BIOE 5620</td>
<td>Cellular Electrophysiology</td>
<td>3</td>
</tr>
</tbody>
</table>

Other elective courses may be taken with the approval of the department graduate committee.

**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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHCL 5100/7100</td>
<td>Experimental Therapeutics I</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5200/7200</td>
<td>Experimental Therapeutics II</td>
<td>3</td>
</tr>
<tr>
<td>PHCL 5770/7770</td>
<td>Current Topics in Toxicology I</td>
<td>1</td>
</tr>
<tr>
<td>PHCL 5440/7440</td>
<td>Current Topics in Interpretation of Pharmaceutical Data</td>
<td>1</td>
</tr>
</tbody>
</table>

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.

Degrees Offered

- DPH in Pharmacy (p. 295)
- MSPS in Health Outcomes & Socioeconomic Sciences (p. 295)
- MSPS in Industrial Pharmacy (p. 296)

PHPR 5260 Pharmacy and Healthcare Administration
[2 credit hours (2, 0, 0)]
Description and analysis of the organization, financing and delivery of healthcare in the U.S.
Term Offered: Fall

PHPR 5300 DESIGN AND APPLICATIONS OF CANCER CHEMOTHERAPY
[1 credit hour (1, 0, 0)]
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 5520 Pharmaceutical Marketing and Management
[3 credit hours (3, 0, 0)]
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 (2, 0, 0)]
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)
Term Offered: Spring, Summer

PHPR 5610 Pharmacoeconomics and Outcomes Research I
[2 credit hours (2, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Fall

PHPR 5680 Parenteral Manufacturing
[2 credit hours (2, 3, 0)]
The theory and technology of parenteral and ophthalmic formulation design, production, sterilization, packaging and stability.
Prerequisites: (PHPR 3010 and PHPR 3070)
Term Offered: Fall

PHPR 5690 Dosage Form Design
[3 credit hours (3, 3, 0)]
The utilization of pharmaceutical principles and practices for the design and manufacture of modern commercial dosage forms such as tablets, aerosols, emulsions, suspensions and solutions emphasizing biopharmaceutically efficacious products.
Prerequisites: (PHPR 3010 and PHPR 3070)
Term Offered: Spring, Fall

PHPR 5700 Equilibrium Phenomenon
[2 credit hours (2, 0, 0)]
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 (0, 0, 0-3)]
Discussion, evaluation, experimentation and production of selected dosage forms. A forum for the discussion of new dosage form technology and advances.
Prerequisites: (PHPR 3010 and PHPR 3070)
Term Offered: Spring, Summer, Fall

PHPR 5720 Pharmaceutical Rate Processes
[3 credit hours (2, 3, 0)]
A theoretical and practical application of kinetic principles applied to pharmaceutical and cosmetic systems in liquid and solid state. A mathematical treatment and development of the equations which support each reaction mechanism.
Term Offered: Fall

PHPR 5770 Advanced Drug Delivery Systems – I
[3 credit hours (3, 0, 0)]
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 are required to design a project proposal for presentation.
Term Offered: Spring, Fall

PHPR 5780 Advanced Drug Delivery Systems-2
[2 credit hours (2, 0, 0)]
This course is designed to provide students with an understanding of the current state of the art for novel drug delivery systems with a particular focus on nanocarrier systems such as nanoparticles, polymeric micelles and solid lipid nanoparticles, for delivering small molecules. This course will introduce students to recent topics in the areas of cancer therapy and site-specific drug delivery.
Prerequisites: PHPR 3020 and PHPR 3030
PHPR 5810 FINANCE AND PERSONAL PLANNING FOR PHARMACISTS
[2 credit hours (2, 0, 0)]
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

PHPR 5870 Compounding Boot Camp
[2 credit hours (0, 2, 0)]
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
Term Offered: Summer, Fall

PHPR 5990 Problems In Pharmacy Practice
[1-6 credit hours (0, 0, 0-18)]
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 (2, 0, 0)]
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.

PHPR 6070 PPD-5
[3 credit hours (3, 0, 0)]
Laboratory course to enhance the application of knowledge gained in the PPT courses, the development of clinical skills and critical thinking required for the provision of patient centered pharmaceutical care.
Prerequisites: PHPR 4080
Corequisites: PHPR 6130, PHPR 6340
Term Offered: Fall

PHPR 6080 PPD-6
[3 credit hours (3, 0, 0)]
Application of knowledge gained in the PPT, drug literature evaluation, and self care courses and the development of clinical skills and critical thinking required for the provision of pharmaceutical care.
Prerequisites: PHPR 6070
Corequisites: PHPR 6140, PHPR 6250
Term Offered: Spring

PHPR 6120 PPT-5
[3 credit hours (3, 0, 0)]
Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of pulmonary and hematologic diseases.
Term Offered: Summer

PHPR 6130 PPT-6
[4 credit hours (4, 0, 0)]
Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of cardiovascular disorders and nutrition.
Prerequisites: PHPR 6120
Corequisites: PHPR 6070
Term Offered: Fall

PHPR 6140 PPT-7
[4 credit hours (4, 0, 0)]
Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of psychiatric/neurologic disorders, pediatrics, and toxicology.
Corequisites: MBC 6320, PHCL 6320
Term Offered: Spring

PHPR 6160 Advanced Applied Pharmacokinetic
[3 credit hours (3, 0, 0)]
Detailed discussion of pharmacokinetic characteristics of drugs which are commonly included in therapeutic drug monitoring including clinical application.
Prerequisites: PHPR 4160
Term Offered: Fall

PHPR 6170 Special Populations and Topics
[3 credit hours (3, 0, 0)]
This course discusses population related differences of geriatric, pediatric, and critically ill populations. The pathophysiology, pharmacokinetics, pharmacodynamics, clinical presentation, etiology, diagnostic findings, and pharmacotherapy of common diseases as well as clinical issues specific to these populations will be presented. Enteral and parenteral nutrition therapies and poison evaluation and management will also be discussed.
Corequisites: PHPR 6460

PHPR 6210 Introduction To Research Methods
[2 credit hours (2, 0, 0)]
General overview and introduction to research process as it pertains to clinical pharmacy practice. Special emphasis given to design issues, particularly those involving human subjects.

PHPR 6220 Pharmacoeconomics and Outcomes Research
[1 credit hour (1, 0, 0)]
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.

PHPR 6230 Patient Care Rounds I
[3 credit hours (3, 0, 0)]
The course will provide students with advanced experiences in applying and integrating biomedical, psychosocial and pharmacoeconomic principles to patient care. Students will present and discuss how they would identify, prevent and resolve the medication-related problems encountered by a diversity of patient populations.
PHPR 6240 Patient Care Rounds II
[3 credit hours (3, 0, 0)]
The course will provide students with advanced experiences in applying and integrating biomedical, psychosocial and pharmacoeconomic principles to patient care. Students will present and discuss how they would identify, prevent and resolve the medication-related problems encountered by a diversity of patient populations.
Prerequisites: PHPR 6230

PHPR 6250 Self-Care
[4 credit hours (4, 0, 0)]
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.
Corequisites: PHPR 6080
Term Offered: Spring

PHPR 6260 PHCAD-3
[1 credit hour (1, 0, 0)]
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
Term Offered: Fall

PHPR 6270 Business Aspects of Pharmacy
[2 credit hours (2, 0, 0)]
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.
Prerequisites: PHPR 6450

PHPR 6280 PHCAD-4
[2 credit hours (2, 0, 0)]
This course focuses on developing, implementing, and evaluating Medication Therapy Management (MTM) and Disease State Management (DSM) programs.
Prerequisites: PHPR 6260
Term Offered: Spring

PHPR 6290 Medication Therapy and Disease State Management for Masters Students
[2 credit hours (2, 0, 0)]
Focusses on developing, implementing, and evaluating Medication Therapy Management and Disease State Management programs.

PHPR 6300 Fluids Electrolytes and Kidney Disease
[2 credit hours (2, 0, 0)]
This course discusses the pharmacology, pathophysiology, diagnosis and therapeutics related to fluids, electrolytes, acid and base disorders, diuretics and kidney disease. Selected disorders of the kidney including acute, chronic and end stage kidney disease, and renal replacement therapy.
Corequisites: PHPR 6450

PHPR 6310 Jurisprudence and Ethics
[1 credit hour (0, 1, 0)]
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 6340 RESEARCH DESIGN AND DRUG LITERATURE EVALUATION 2
[2 credit hours (2, 0, 0)]
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
Corequisites: PHPR 6070
Term Offered: Fall

PHPR 6370 Nutrition
[1 credit hour (1, 0, 0)]
An overview of the fundamental principles of nutritional support and the pharmacist's role in providing nutritional support services.

PHPR 6380 Pathophysiology And Pharmacotherapy: Endocrinology
[2 credit hours (2, 0, 0)]
Discussion of the pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of endocrine disorders.
Term Offered: Spring

PHPR 6400 Topics in Internal Medicine
[2 credit hours (2, 0, 0)]
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: Summer

PHPR 6410 Leadership: Principles and Practice
[2 credit hours (2, 0, 0)]
This course will facilitate student discovery of the concept of self-betrayal and how it impacts the different relationships in their lives. 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? The content will be facilitated by the instructor through student reading, self-reflection, and group discussion. Once we have discussed possible solutions to the 3 questions, we will also take a deeper look at how this material impacts some of the different pharmacy and healthcare related areas students will encounter.
Term Offered: Summer

PHPR 6460 Pharmacy Skills Development - 5
[2 credit hours (1, 1, 0)]
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 (1, 1, 0)]
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 6520 Analysis Of The Pharmaceutical Environment
[2 credit hours (2, 0, 0)]
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
Term Offered: Spring, Fall

PHPR 6530 Research Methods In Pharmacy Practice
[2 credit hours (2, 0, 0)]
An introduction to research methods and principles used in designing, planning, implementing, analyzing and interpreting research projects in pharmacy practice.
Term Offered: Spring

PHPR 6550 Management Topics For Clinical Practice
[2 credit hours (2, 0, 0)]
Description of nature of management, basic management concepts and tools and environmental concerns pertinent to pharmacy practice in all of its practice settings.

PHPR 6600 Seminar In Administrative Pharmacy
[1 credit hour (0, 0, 1)]
A critical analysis of current problems in pharmacy practice with individual case presentations.
Term Offered: Spring, Fall

PHPR 6610 Seminar I
[1 credit hour (0, 0, 1)]
Instruction on preparation and presentation of clinical and/or scientific seminars.
Term Offered: Spring, Fall

PHPR 6670 Chemical Dependency And The Pharmacist
[3 credit hours (3, 0, 0)]
Overview of chemical dependency and substance abuse, with emphasis on the neuropathophysiology of dependency and the pharmacology of drugs of abuse. Also include extensive review of the impact of chemical dependency on the healthcare professional, with as focus on their impact to pharmacists.
Term Offered: Summer

PHPR 6700 Special Topics in Diabetes Care
[2 credit hours (2, 0, 0)]
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.
Prerequisites: PHPR 3140
Term Offered: Summer

PHPR 6800 Monitoring Therapy
[1 credit hour (1, 0, 0)]
An introduction to medical terminology and procedures with reference to physical exam, patient history, common diagnostic procedures and applications to drug and disease state monitoring.

PHPR 6810 Hospital Pharmacy Administration
[3 credit hours (3, 0, 0)]
An examination of the administrative and supervisory aspects of hospital pharmacy practice. Emphasis is placed on management techniques rather than functions performed.

PHPR 6820 Selected Topics In Hospital Pharmacy
[3 credit hours (3, 0, 0)]
A treatment of contemporary trends which influence the practice of hospital pharmacy such as drug distribution systems. Emphasis is placed upon these concepts in light of the resources present.

PHPR 6830 Advanced Community Pharmacy Administration
[3 credit hours (3, 0, 0)]
An advanced analysis of concepts, practices and issues related to retail pharmacy management.
Term Offered: Fall

PHPR 6840 Selected Topics In Community Pharmacy
[3 credit hours (3, 0, 0)]
Examination of contemporary trends influencing community pharmacy, such as home healthcare and prescription drug programs. Emphasis is placed on the impact of these trends in community pharmacy management.
Term Offered: Fall

PHPR 6850 Product Development Laboratory
[2 credit hours (2, 2, 0)]
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
Term Offered: Spring

PHPR 6860 Advanced Drug Delivery Lab
[2 credit hours (0, 2, 0)]
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

PHPR 6890 M.s. Project In Administrative Pharmacy
[1-4 credit hours (0, 0-12, 0)]
Development of a practical project in the pharmacy environment on a practicum basis. A written, bound report and oral presentation are required.
Term Offered: Spring, Fall

PHPR 6920 Introductory Pharmacy Practice Experience 5
[1 credit hour (0, 0, 1)]
Third professional year course designed to enhance professional growth through application of skills and knowledge gained in IPPE-1 and IPPE-2 to various areas of pharmacy practice to provide the best possible patient care.
Prerequisites: PHPR 4920
Term Offered: Spring, Summer, Fall

PHPR 6940 Early Practice Exposure
[2 credit hours (0, 0, 2)]
Supervised instruction and participation in pharmacy practice at actual practice sites such as community, hospital, managed care, long-term care and nuclear pharmacies.
PHPR 6950 Seminar In Industrial Pharmacy
[1 credit hour (0, 0, 1)]
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 (0, 0, 0-18)]
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 6980 Special Topics
[1-5 credit hours (0, 0, 0-5)]
Selected study of topics in Pharmacy Practice. New pharmacy and healthcare strategies are examined in detail.

Term Offered: Spring

PHPR 8260 Jurisprudence & Ethics For Pharmacy
[1 credit hour (1, 0, 0)]
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.

PHPR 8540 Patient Monitoring Principles
[3 credit hours (2, 0, 6)]
Application of didactic geriatric drug therapy principles in a geriatric patient care environment. Emphasis will be placed on geriatric drug monitoring skills.

Prerequisites: PHPR 4140
Corequisites: PHPR 8500

Term Offered: Summer

PHPR 8620 Seminar II
[2 credit hours (0, 0, 2)]
Discussion of current topics relating to pharmacy practice.

Prerequisites: PHPR 6610

PHPR 8630 Longitudinal Drug Information
[2 credit hours (0, 0, 2)]
Presentation of clinical and/or scientific seminar and completion of in-depth pharmacy practice related paper.

Term Offered: Spring, Summer, Fall

PHPR 8940 Clinical Clerkship
[4 credit hours (0, 0, 16)]
Advanced clinical experience in various specialties of medicine and pharmacy. This course will consist of 340 practicum/internship hours for each section (2 months).

Term Offered: Spring, Summer, Fall

PHPR 8980 Special Topics
[1-5 credit hours (0, 0, 0-5)]
Selected study of topics in Pharmacy Practice. New Pharmacy and healthcare strategies are examined in detail.

Term Offered: Spring, Summer, Fall

D PH in Pharmacy

The Doctor of Pharmacy degree for applicants having, among other qualifications, a B.S. in Pharmacy, is unavailable at this time.

MSPS in Health Outcomes & Socioeconomic Sciences

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 socioeconomic sciences, 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 socioeconomic sciences major 27 semester hours. In addition, each major requires a minimum of 6 semester hours of thesis research.

This program is not currently accepting new students.

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, and scores from the aptitude portion of the GRE.

International students are required to take the TOEFL, 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 27 semester hours of course work plus a minimum of 6 thesis hours are needed for the degree. For students enrolled in the clinical track a minimum of 24 semester hours of course work plus a minimum of 6 thesis hours are needed for the degree. Candidates that would be eligible for the Clinical Track include:

1. University of Toledo students or graduates with eligibility based on satisfactory completion of PHPR 3260 (Pharmacy HealthCare Administration 1) and PHPR 4520 (Pharmacy HealthCare Administration 2) and

2. PharmD. graduates from other programs with eligibility reviewed on a case by case basis with respect to competencies in Pharmacy HealthCare Administration.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>PHPR 5260</td>
<td>Pharmacy and Healthcare Administration</td>
<td>2</td>
</tr>
<tr>
<td>PUBH 6000</td>
<td>Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>PHPR 5590</td>
<td>Readings in Access and Cultural Competence</td>
<td>2</td>
</tr>
<tr>
<td>PHPR 5610</td>
<td>Pharmacoeconomics and Outcomes Research I</td>
<td>2</td>
</tr>
<tr>
<td>PHPR 6600</td>
<td>Seminar In Administrative Pharmacy</td>
<td>1</td>
</tr>
<tr>
<td>PHPR 6530</td>
<td>Research Methods In Pharmacy Practice</td>
<td>2</td>
</tr>
<tr>
<td>PHPR 6960</td>
<td>M.s. Thesis Research In Pharmacy ¹</td>
<td>1-6</td>
</tr>
<tr>
<td>PUBH 6060</td>
<td>Advanced Biostatistics</td>
<td>3</td>
</tr>
</tbody>
</table>

¹ A minimum of 6 credit hours of Thesis Research in Pharmacy is required.

### Track Courses

This major has 5 tracks. Each student must pick a tract in their first semester. Track courses must be approved by the student’s major advisor. Students may pick from the courses listed below or an equivalent/alternative course as deemed appropriate by their major advisor. Minimum of 9 credit hours of track courses required.

Program Tracks, with approved track courses are listed below:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBH 6460</td>
<td>Health Promotion Programs</td>
<td></td>
</tr>
<tr>
<td>PUBH 6600</td>
<td>Health Behavior</td>
<td></td>
</tr>
</tbody>
</table>

1. A minimum of 6 credit hours of PHPR 6960 Thesis Research in Pharmacy is required.

All students admitted to this option, must comply with the policies and procedures stated in the ‘graduate student handbook’, provided to students during orientation. Additional requirements, for successful completion of this degree option, are stated in the graduate handbook.

### 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 socioeconomic sciences, 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 socioeconomic sciences 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, and scores from the aptitude portion of the GRE.

International students are required to take the TOEFL, 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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MBC 3550</td>
<td>Physiological Chemistry I: Structure And Function Of Biological Macromolecules</td>
<td>3</td>
</tr>
<tr>
<td>MBC 3560</td>
<td>Physiological Chemistry II: Chemical Regulation Of Cells And Organisms</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>8-9</td>
</tr>
<tr>
<td>PHPR 3070 &amp; PHPR 3080</td>
<td>Pharmaceutics and Pharmaceutical Technology I and PPD-2</td>
<td></td>
</tr>
<tr>
<td>CHEM 3710 &amp; CHEM 3720 &amp; CHEM 3730</td>
<td>Physical Chemistry For The Biosciences I and Physical Chemistry For The Biosciences II and Physical Chemistry I</td>
<td></td>
</tr>
</tbody>
</table>

**Graduate Required Courses**

- 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
- CHEM 6810 Materials Science I 4
- PHPR 5700 Equilibrium Phenomenon 2
- PHPR 5780 Advanced Drug Delivery Systems–2 2
- CHEM 6310 Separation Methods 3

**Electives (Not required, optional)**

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>PHPR 5720</td>
<td>Pharmaceutical Rate Processes</td>
</tr>
<tr>
<td>PHCL 5760</td>
<td>Toxicokinetics</td>
</tr>
<tr>
<td>PHPR 5770</td>
<td>Advanced Drug Delivery Systems – I</td>
</tr>
<tr>
<td>PUBH 6000</td>
<td>Biostatistics</td>
</tr>
<tr>
<td>CHEM 6300</td>
<td>Advanced Analytical Chemistry</td>
</tr>
<tr>
<td>MBC 5100</td>
<td>Ethical Conduct Research</td>
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<tr>
<td>PHPR 6850</td>
<td>Product Development Laboratory</td>
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<tr>
<td>PHPR 6950</td>
<td>Seminar In Industrial Pharmacy</td>
</tr>
<tr>
<td>PHPR 6960</td>
<td>M.s. Thesis Research In Pharmacy (6 hours minimum*)</td>
</tr>
</tbody>
</table>

1. Courses will be evaluated for students with a B.S. in pharmacy, Pharm.D. or B.S.P.S. degree.
2. Seminar course must be taken 2 times therefore 2 credit hours total to meet requirements.
3. Two credit hours of electives must be satisfied by taking courses within the PHPR Department.

*6 thesis credit hours are the required minimum; more than 6 credit hours can be taken.

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.

**Degrees/Certificates Offered**

- Doctor of Philosophy in Experimental Therapeutics
- Doctor of Philosophy in Medicinal Chemistry
- Master of Science in Medicinal Chemistry
- Master of Science in Pharmaceutical Sciences
• Health Outcomes and Socioeconomic Sciences
• Industrial Pharmacy
• Pharmacology/Toxicology

Pharm.D./Doctor of Philosophy in Medicinal Chemistry Dual Degree
PharmD/Doctor of Philosophy in Experimental Therapeutics Dual Degree
Bachelor of Science in Pharmaceutical Sciences (Medicinal and Biological Chemistry) and Master of Science in Medicinal Chemistry (BSPS/MS) combined 5-year option
Bachelor of Science in Pharmaceutical Sciences (Pharmacology/Toxicology) and Master of Science in Pharmaceutical Sciences / Pharmacology Toxicology (BSPS/MS) combined 5-year option
Bachelor of Science in Pharmaceutical Science/ M.S. Law with regulatory compliance combined 5-year option
JUDITH HERB COLLEGE OF EDUCATION

2018-2019 Judith Herb College of Education Graduate Catalog

COLLEGE MISSION AND VISION

The mission of the Judith Herb College of Education is to prepare educators, instructional leaders, and scholars who are capable of constructing and sustaining effective learning environments through the development and practice of innovative educational theories and pedagogical approaches.

Vision: Shaping the future of education for an ever-changing world.

Our graduates go on to serve as leaders in a variety of fields, both academic and professional. While our students and alumni may appear to have diverse interests, they have one thing in common — they are deeply committed to serving others and to making their communities, their state, their nation, and their world a better place. Our faculty has much to offer and they are committed to supporting our students and the larger community.

For graduate programs, we offer:

• Four master’s degrees with 31 areas of concentration,
• Two Education Specialist degrees,
• Three doctoral degrees with 12 areas of concentration, and
• Four certificate programs.

COLLEGE ADMINISTRATION

Dr. Raymond Witte, dean
Gillham Hall Room 3100K
Phone: 419.530.6126
Fax: 419.530.7719
raymond.witte@utoledo.edu

Dr. Rebecca Schneider, associate dean of graduate education
Gillham Hall Room 3100H
Phone: 419.530.2504
Fax: 419.530.7719
rebecca.schneider@utoledo.edu

College Policies (Graduate Handbook)

COGS Graduate Student Handbook (http://www.utoledo.edu/graduate/files/Graduate%20Student%20Handbook%202015-2016.pdf)

• College Policies and Procedures (p. 392)
• Academic Regulations (p. 394)
• Other Policies and Information (p. 399)

Departments

• Department of Curriculum and Instruction (p. 299)
• Department of Early Childhood, Higher Education, and Special Education (p. 337)
• Department of Educational Foundations and Leadership (p. 362)

Department of Curriculum and Instruction

Rebecca Schneider, chair

Master’s, specialist and doctoral degrees are housed within this department. In addition, graduate licensure programs in middle childhood education, adolescent and young adult education, career and technical education, foreign language education, art education, and music education as well as special programs in literacy and educational technology are available.

Educational programs at The University of Toledo are accredited by the Council for Accreditation of Educator Preparation (CAEP).

Educational Specialist (Ed.S.) Degree Programs

Educational specialist (Ed.S.) degree is available through a post-master’s graduate program that provides students an area of educational specialization with emphasis on practice. Specific areas represented are curriculum and instruction, educational technology, secondary education, and career and technical education.

The Ed.S. in curriculum and instruction is designed to meet the needs of individuals involved with the curriculum, teaching, and supervision aspects of discipline-centered areas of study. The degree provides patterns of study for teachers and supervisors who want an education beyond the master’s degree as a specialist, but who are not interested in a doctoral degree. For the program and requirements of a specific area, contact a faculty advisor.

Doctoral Degree Programs

The department offers a doctoral degree with concentrations in curriculum and instruction, educational technology, and secondary education. In addition, these doctoral programs are also available as
minor areas of study to support other programs. Students should discuss these alternatives with their advisors.

Degrees Offered

- EdS in Curriculum and Instruction (p. 307)
- EdS in Curriculum and Instruction: Career and Technical Education (p. 307)
- EdS in Curriculum and Instruction: Early Childhood Education (p. 308)
- EdS in Curriculum and Instruction: Secondary Education (p. 308)
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- EdS in Educational Administration and Supervision (p. 309)
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CI 5120 Developing Instruction in Mathematics and Science for Grades 4-5
[3 credit hours (0, 0, 3)]
A course in pedagogy and content for pre-service teachers currently working on Ohio's Early Childhood PK-3 LAMP licensure program and licensed teachers who have completed Ohio's PK-3 licensure program and are seeking to extend their license to be eligible to teach all content in grades four and five. The course will focus on the mathematics and science outlined in Ohio's standards fro teaching mathematics and science in grades 4 and 5.

Term Offered: Fall

CI 5190 Secondary Field Experience II
[3 credit hours (0, 0, 12)]
Field experience for alternative 712 certification. Classroom observations and reports Teach series of lessons or unit of study in secondary classroom. Students will develop and implement a unit plan in the content area integrating teaching of content, thinking skills and adjusting the unit to a special needs population.

Term Offered: Spring, Fall

CI 5300 Literature For Children
[3 credit hours (3, 0, 0)]
Emphasis on all genres of literature for children, including poetry, traditional literature, fantasy, realistic fiction, biography and other information books, particularly for early childhood and middle grades learners. Instructional strategies for engaging learners with children's literature and ways of increasing home-school connections through use of children's literature also introduced.

CI 5320 Literature For Young Adults
[3 credit hours (3, 0, 0)]
Survey of literature materials written for the junior and senior high school student. Emphasis is placed on all genres, literary elements and uses of literature across the curriculum.

Term Offered: Spring, Fall

CI 5360 Multicultural Literature
[3 credit hours (3, 0, 0)]
Picture books, fiction, biography and poetry appropriate for elementary and middle school students that interpret and reflect honestly the lives of persons of color will be studied and evaluated.

Term Offered: Fall

CI 5430 Issues In Second Language Instruction
[3 credit hours (3, 0, 0)]
A critical study of teaching foreign languages and English as a second language across age groups including current theories, curriculum, materials, teaching strategies and assessment.

Term Offered: Spring

CI 5470 Literacy Assessment and Remediation
[3 credit hours (3, 0, 0)]
Examine current 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. Apply word identification, comprehension, fluency, vocabulary and writing instructional strategies for supporting readers in an experiential learning environment.

Term Offered: Spring, Summer, Fall
CI 5490 Content Area Reading For Adolescent Young Adult, Multi-Age, And Career And Technical Education Teach
[3 credit hours (3, 0, 0)]
Study of the integration of reading comprehension, writing, oral language and word skill development in content reading. Attention will be given to instructional methods as well as assessment practices.
Term Offered: Summer, Fall

CI 5510 Mathematics For The Young Child
[3 credit hours (3, 0, 0)]
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 5530 Teaching and Learning Geometry and Measurement
[3 credit hours (3, 0, 0)]
Examination of the development of mathematics concepts and skills across the K-12 curriculum. Discussion of mathematics content, teaching methods, instructional materials, assessment techniques and applications to classroom practice.
Term Offered: Fall

CI 5540 Teaching and Learning Algebra
[3 credit hours (3, 0, 0)]
Examination of the development of algebraic concepts and skills across the K-12 curriculum. Emphasis on current research, theory, and innovative approaches for teaching and learning algebra.
Term Offered: Fall

CI 5550 Teaching Problem Solving In Mathematics
[3 credit hours (3, 0, 0)]
Focuses on the art of problem solving and methods and materials for classroom implementation. Consideration given to current trends and related resource regarding use of problem solving in mathematics teaching.
Term Offered: Fall

CI 5560 Assessment in Mathematics Education
[3 credit hours (3, 0, 0)]
Study of the role of assessment in the teaching and learning of mathematics. Examination of current research, assessment techniques, and trends and ways in which assessment can guide and inform mathematics instruction.
Term Offered: Fall

CI 5580 Teaching and Learning Number, Data, and Probability
[3 credit hours (3, 0, 0)]
Examination of the development of concepts and skills associated with number, data, and probability across the K-12 curriculum. Emphasis on current research, theory, and innovative instructional approaches.

CI 5590 Topics in Mathematics Education
[3 credit hours (0, 0, 3)]
Examination and exploration of policy issues, research, and national trends that have implications for teachers, curriculum specialists, school districts, and others involved in mathematics education.
Term Offered: Summer, Fall

CI 5640 Environmental Education
[3 credit hours (3, 0, 0)]
An experiential course for those interested in developing their knowledge and expertise in Environmental Education. Participants will develop a personal response to current environmental issues and learn how to help others do the same. Participants include teachers, naturalists, environmental science professionals and anyone interested in environmental education. The course will take a practical approach to the NAEE standards for environmental and conservation education as well as the NGSS and relevant Common Core State Standards.

CI 5650 Mentoring a Preservice Teacher
[3 credit hours (0, 0, 3)]
Designed for practicing teachers, this course explores the role of a mentor teacher in guiding prospective teachers in learning to teach. Emphasis is on developing productive mentor-mentee relationships; guiding planning, teaching and assessment; providing useful feedback; and assessing preservice teacher learning.

CI 5660 Technological Tools in Science Education
[3 credit hours (0, 0, 2.5)]
Designed for science educators, this course explores the use of learning technologies for teaching and learning science. Students investigate theoretical frameworks for thinking about tools to support science learning and the role of technology in science education. This course explores technologies to extend students' capabilities at inquiry and enhance their thinking about science phenomena, how technologies can enhance learning within and beyond classrooms, and how technologies support and change science teachers' work with learners.

CI 5690 Project-Based Science
[3 credit hours (0, 0, 3)]
Advanced methods for teaching science to engage learners in extended inquiry as they investigate real-world questions. Emphasis on innovative instructional strategies, research and theoretical perspectives to promote deep understanding of fundamental concepts.

CI 5690 Project-Based Science
[3 credit hours (0, 0, 3)]
Advanced methods for teaching science to engage learners in extended inquiry as they investigate real-world questions. Emphasis on innovative instructional strategies, research and theoretical perspectives to promote deep understanding of fundamental concepts.

Term Offered: Spring, Summer, Fall

CI 5810 Instructional Strategies
[3 credit hours (3, 0, 0)]
This course examines the purposes and practices of effective teachers. Participants critically investigate different instructional models for teaching including mediated instruction, discussion, inquiry management, project-based instruction, cooperative learning and the use of technology. Many different teaching methodologies will be demonstrated, modeled and critically examined. Participants will draft a personal philosophy of education. Focus is firmly placed on individual student learning outcomes in a climate of increasing diversity in the 21st century.
Term Offered: Spring, Summer, Fall
CI 5870 Secondary School Curriculum  
[3 credit hours (3, 0, 0)]  
A critical exploration of secondary school curricular issues, trends, and practices including the historical, political, social, psychological, and philosophical traditions. Participants examine how secondary curriculum is developed, implemented and institutionalized. Emphasis will be placed on topics including teacher leadership, collaboration, action research, and reflective decision making in curriculum work. This course is for teachers, administrators, and anyone interested in how curriculum has influenced educational reform and can influence future reform.  
Term Offered: Spring  

CI 5980 Special Topics In Curriculum & Instruction  
[1-5 credit hours (0, 0, 0-3)]  
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 (0, 0, 0)]  
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 (3, 0, 0)]  
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.  
Term Offered: Fall  

CI 6120 Social Studies Methods of Teaching  
[3 credit hours (3, 0, 0)]  
An initial in-depth study of methods and materials for teaching and learning Social Studies in middle and secondary classrooms with emphasis on teacher leadership, collaboration, action research, and reflective decision making in curriculum work. This course is for teachers, administrators, and anyone interested in how curriculum has influenced educational reform and can influence future reform.  
Term Offered: Spring  

CI 6130 Mathematics Method of Teaching  
[3 credit hours (3, 0, 0)]  
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.  
Term Offered: Fall  

CI 6140 Science Methods of Teaching  
[3 credit hours (3, 0, 0)]  
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 learners; for LAMP Middle Childhood and Adolescent to Young Adult licensure only. Admission to SECE or MIDD LAMP program required.  
Corequisites: CI 6240  
Term Offered: Fall  

CI 6150 Advanced Methods of Teaching in Language Arts  
[3 credit hours (3, 0, 0)]  
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 or CI 6120 or CI 6130 or CI 6140  
Corequisites: CI 6250  
Term Offered: Spring  

CI 6160 Social Studies Advanced Methods of Teaching  
[3 credit hours (3, 0, 0)]  
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 or CI 6120 or CI 6130 or CI 6140  
Corequisites: CI 6260  
Term Offered: Spring  

CI 6170 Mathematics Advanced Methods of Teaching  
[3 credit hours (3, 0, 0)]  
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 or CI 6120 or CI 6130 or CI 6140  
Corequisites: CI 6270  
Term Offered: Spring  

CI 6180 Science Advanced Methods of Teaching  
[3 credit hours (3, 0, 0)]  
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 or CI 6130 or CI 6140  
Corequisites: CI 6280  
Term Offered: Spring
Prerequisites:

Corequisites:

SECE or MIDD LAMP program required.

Corequisites: CI 6110

Term Offered: Fall

CI 6210 Language Arts Practicum of Teaching
[3 credit hours (0, 0, 3)]
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 6120

Term Offered: Fall

CI 6220 Social Studies Practicum
[3 credit hours (0, 0, 3)]
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 Mathematics Practicum
[3 credit hours (0, 0, 3)]
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 Science Practicum
[3 credit hours (0, 0, 3)]
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 Language Arts Internship and Student Teaching
[3 credit hours (0, 0, 3)]
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 or CI 6220 or CI 6230 or CI 6240

Corequisites: CI 6150

Term Offered: Spring

CI 6260 Social Studies Student Teaching and Internship
[3 credit hours (0, 0, 3)]
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 or CI 6220 or CI 6230 or CI 6240

Corequisites: CI 6160

Term Offered: Spring

CI 6270 Mathematics Student Teaching and Internship
[3 credit hours (0, 0, 3)]
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 or CI 6220 or CI 6230 or CI 6240

Corequisites: CI 6170

Term Offered: Spring

CI 6280 Science Student Teaching and Internship
[3 credit hours (0, 0, 3)]
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 or CI 6220 or CI 6230 or CI 6240

Corequisites: CI 6180

Term Offered: Spring

CI 6370 Fundamentals Of Grant Writing
[3 credit hours (0, 0, 3)]
This seminar will teach participants about fundamentals of grant writing. Topics covered will include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.

Term Offered: Summer

CI 6400 Trends In Literacy Acquisition
[3 credit hours (0, 0, 3)]
Study of the theories and foundational components of literacy instruction. Factors affecting literacy development including oral language, phonemic awareness, phonics, fluency, comprehension, vocabulary, reading-writing connections and motivation considered. Issues for learners from diverse backgrounds including English Language Learners examined.

Term Offered: Spring, Summer, Fall

CI 6410 Content Area Literacy
[3 credit hours (0, 0, 3)]
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 or CI 6220 or CI 6230 or CI 6240

Corequisites: CI 6150

Term Offered: Spring

CI 6420 Reading Disability Practicum
[3 credit hours (0, 0, 3)]
In depth tutoring with learners ranging from preK to 12th grade. Data-driven instructional decision-making as well as considerations for individualizing instruction emphasized. Design and conduct of a professional development workshop for literacy educators based on tutoring cases is a culminating aspect of the course.

Prerequisites: CI 6400 and CI 6430

Term Offered: Spring, Summer, Fall
CI 6490 Theory And Research In Literacy
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Designed for future teacher educators and teacher leaders, students investigate frameworks for teacher professional knowledge including pedagogical content knowledge, teacher learning, educational 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 (3, 0, 0)]
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 6790 Theory And Research In Social Studies
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Designed for educators, 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 professional literature.
Term Offered: Spring, Summer, Fall

CI 6840 Curriculum For Educational Leaders
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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: Summer

CI 6900 Masters Research Seminar In Curriculum And Instruction
[2-3 credit hours (2-3, 0, 0)]
Graduate seminar designed as a culminating experience in the master’s programs in Curriculum and Instruction. Participants critically examine the research and scholarship in their specific field of interest. Emphasis is placed on professional academic collaboration, peer review, constructive criticism. The final product of this seminar is an academic manuscript of publishable quality that contributes to the academic discourse in a particular body of scholarship.
Prerequisites: CI 6490 or CI 6590 or CI 6690 or CI 6790 or CI 6890 or CIEC 6950
Term Offered: Spring, Summer, Fall

CI 6920 Masters Research Project In Curriculum And Instruction
[1-3 credit hours (0, 0, 0)]
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 Student Teaching and Internship: LAMP [3 credit hours (0, 0, 3)]
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 or CI 6260 or CI 6270 or CI 6280 and CI 6150 or CI 6160 or CI 6170 or CI 6180
Term Offered: Spring, Summer

CI 6960 Masters Thesis In Curriculum And Instruction [1-3 credit hours (0, 0, 0)]
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, Fall

CI 7530 TEACHING AND LEARNING GEOMETRY AND MEASUREMENT [3 credit hours (3, 0, 0)]
Examination of the development of mathematics concepts and skills associated with geometry and measurement across the K-12 curriculum. Emphasis on current research, theory, and innovative instructional approaches to the teaching and learning of geometry and measurement.
Term Offered: Spring

CI 7540 Teaching and Learning Algebra [3 credit hours (3, 0, 0)]
Examination of the development of algebraic concepts and skills across the K-12 curriculum. Emphasis on current research, theory, and innovative approaches for teaching and learning algebra.
Term Offered: Fall

CI 7560 ASSESSMENT IN MATHEMATICS EDUCATION [3 credit hours (3, 0, 0)]
Study of the role of assessment in the teaching and learning of mathematics. Examination of current research, assessment techniques, and trends and ways in which assessment can guide and inform mathematics instruction
Term Offered: Fall

CI 7580 TEACHING AND LEARNING NUMBER, DATA, AND PROBABILITY [3 credit hours (3, 0, 0)]
Examination of the development of concepts and skills associated with number, data, and probability across the K-12 curriculum. Emphasis on current research, theory, and innovative instructional approaches

CI 7590 Topics in Mathematics Education [3 credit hours (0, 0, 3)]
Examination and exploration of policy issues, research, and national trends that have implications for teachers, curriculum specialists, school districts, and others involved in mathematics education.
Term Offered: Fall

CI 7650 Mentoring a Preservice Teacher [3 credit hours (0, 0, 3)]
Designed for practicing teachers, this course explores the role of a mentor teacher in guiding prospective teachers in learning to teach. Emphasis is on developing productive mentor-mentee relationships; guiding planning, teaching and assessment; providing useful feedback; and assessing preservice teacher learning.

CI 7660 Technological Tools In Science Education [3 credit hours (0, 0, 2.5)]
Designed for science educators, this course explores the use of learning technologies for teaching and learning science. Students investigate theoretical frameworks for thinking about tools to support science learning and the role of technology in science education. This course explores technologies to extend students' capabilities at inquiry and enhance their thinking about science phenomena, how technologies can enhance learning within and beyond classrooms, and how technologies support and change science teachers' work with learners.
Term Offered: Spring

CI 7690 Project-Based Science [3 credit hours (3, 0, 0)]
Advanced methods for teaching science to engage learners in extended inquiry as they investigate real-world questions. Emphasis on innovative instructional strategies, research and theoretical perspectives to promote deep understanding of fundamental concepts.
Term Offered: Spring, Summer

CI 7810 Instructional Strategies [3 credit hours (3, 0, 0)]
This course examines the purposes and practices of effective teachers. Participants critically investigate different instructional models for teaching including mediated instruction, discussion, inquiry management, project-based instruction, cooperative learning and the use of technology. Many different teaching methodologies will be demonstrated, modeled and critically examined. Participants will draft a personal philosophy of education. Focus is firmly placed on individual student learning outcomes in a climate of increasing diversity in the 21st century.
Term Offered: Spring, Summer, Fall

CI 7870 Secondary School Curriculum [3 credit hours (3, 0, 0)]
A critical exploration of secondary school curricular issues, trends, and practices including the historical, political, social, psychological, and philosophical traditions. Participants examine how secondary curriculum is developed, implemented and institutionalized. Emphasis will be placed on topics including teacher leadership, collaboration, action research, and reflective decision making in curriculum work. This course is for teachers, administrators, and anyone interested in how curriculum has influenced educational reform and can influence future reform.
Term Offered: Spring

CI 7940 Specialist Practicum In Curriculum And Instruction [1-3 credit hours (0, 0, 0)]
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 (0, 0, 0-5)]
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 (3, 0, 0)]
This seminar will teach participants about fundamentals of grant writing. Topics covered will include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.
Term Offered: Summer
CI 8400 Trends In Literacy Acquisition
[3 credit hours (0, 0, 3)]
Study of the theories and foundational components of literacy instruction. Factors affecting literacy development including oral language, phonemic awareness, phonics, fluency, comprehension, vocabulary, reading-writing connections and motivation considered. Issues for learners from diverse backgrounds including English Language Learners examined.
Term Offered: Spring, Summer, Fall

CI 8410 Content Area Literacy
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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

CI 8440 Remediation Practicum
[3 credit hours (0, 0, 3)]
In depth tutoring with learners ranging from preK to 12th grade. Data-driven instructional decision-making as well as considerations for individualizing instruction emphasized. Design and conduct of a professional development workshop for literacy educators based on tutoring cases is a culminating aspect of the course.
Prerequisites: (CI 6400 and CI 6430)
Term Offered: Spring, Summer, Fall

CI 8490 Theory And Research In Literacy
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 3)]
The doctoral research cycle begins by introducing students to issues in curriculum and instruction, establishing a research agenda, and building a community of scholars. Prerequisite 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 (0, 0, 3)]
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
Term Offered: Spring, Summer

CI 8720 Doctoral Pro-Seminar III: Themes in theory and research in curriculum and instruction.
[3 credit hours (0, 0, 3)]
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
Term Offered: Spring, Summer, Fall

CI 8790 Theory And Research In Social Studies
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
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 8810 Curriculum Development: K-12
[3 credit hours (3, 0, 0)]

CI 8830 Curriculum Trends And Issues
[3 credit hours (3, 0, 0)]

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

CI 8840 Curriculum For Educational Leaders
[3 credit hours (3, 0, 0)]

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 (3, 0, 0)]

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 8940 Doctoral Internship In Curriculum And Instruction
[1-3 credit hours (0, 0, 0-12)]

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 (0, 0, 0)]

Original research in an area of curriculum and instruction.

**Term Offered:** Spring, Summer, Fall

**EdS in Curriculum and Instruction**

**Admission to Educational Specialist Degree Programs**

Admission requirements to the Ed.S. programs include a bachelor's degree from an accredited four-year institution and a master's degree from an accredited institution.

- The three (3) letters of recommendation are expected from academic professionals to support the applicant's ability and character to succeed in the graduate degree.
- A statement of purpose is required to demonstrate writing ability and to describe the applicant's goals and how the educational specialist degree supports those goals.

**Requirements for Educational Specialist Programs**

- Students must complete a minimum of 32 semester hours of approved graduate coursework beyond the master's level with a minimum GPA of 3.0 on a 4.0 scale.
- Students are required to develop a plan of study with their advisor that specifies the coursework that must be completed to fulfill degree requirements. This plan must be filed prior to the completion of 15 semester hours and must be approved by the advisor, the department chairperson, and the college associate dean.
- All course work for the Ed.S. must be taken within a six-year period immediately preceding the date the degree is awarded.
- Programs require the completion of a culminating experience, which may include field experiences, internships, or other professional projects (e.g., CI 7940, CIEC 7940).
- No more than a total of six semester hours of credit from any combination of workshops (7950), problems or special topics courses (7980) or independent studies (7990 or 8990) may be applied to a specialist's program.

**EdS in Curriculum and Instruction: Career and Technical Education**
Admission to Educational Specialist Degree Programs
Admission requirements to the Ed.S. programs include a bachelor’s degree from an accredited four-year institution and a master’s degree from an accredited institution.

- The three (3) letters of recommendation are expected from academic professionals to support the applicant’s ability and character to succeed in the graduate degree.
- A statement of purpose is required to demonstrate writing ability and to describe the applicant’s goals and how the educational specialist degree supports those goals.

Requirements for Educational Specialist Programs

- Students must complete a minimum of 32 semester hours of approved graduate coursework beyond the master’s level with a minimum GPA of 3.0 on a 4.0 scale.
- Students are required to develop a plan of study with their advisor that specifies the coursework that must be completed to fulfill degree requirements. This plan must be filed prior to the completion of 15 semester hours and must be approved by the advisor, the department chairperson, and the college associate dean.
- All course work for the Ed.S. must be taken within a six-year period immediately preceding the date the degree is awarded.
- Programs require the completion of a culminating experience, which may include field experiences, internships, or other professional projects (e.g., CI 7940, CIEC 7940).
- No more than a total of six semester hours of credit from any combination of workshops (7950), problems or special topics courses (7980) or independent studies (7990 or 8990) may be applied to a specialist’s program.

EdS in Curriculum and Instruction: Secondary Education

Admission to Educational Specialist Degree Programs
Admission requirements to the Ed.S. programs include a bachelor’s degree from an accredited four-year institution and a master’s degree from an accredited institution.

- The three (3) letters of recommendation are expected from academic professionals to support the applicant’s ability and character to succeed in the graduate degree.
- A statement of purpose is required to demonstrate writing ability and to describe the applicant’s goals and how the educational specialist degree supports those goals.

Requirements for Educational Specialist Programs

- Students must complete a minimum of 32 semester hours of approved graduate coursework beyond the master’s level with a minimum GPA of 3.0 on a 4.0 scale.
- Students are required to develop a plan of study with their advisor that specifies the coursework that must be completed to fulfill degree requirements. This plan must be filed prior to the completion of 15 semester hours and must be approved by the advisor, the department chairperson, and the college associate dean.
- All course work for the Ed.S. must be taken within a six-year period immediately preceding the date the degree is awarded.
- Programs require the completion of a culminating experience, which may include field experiences, internships, or other professional projects (e.g., CI 7940, CIEC 7940).
- No more than a total of six semester hours of credit from any combination of workshops (7950), problems or special topics courses (7980) or independent studies (7990 or 8990) may be applied to a specialist’s program.
Admission to Educational Specialist Degree Programs

Admission requirements to the Ed.S. programs include a bachelor's degree from an accredited four-year institution and a master's degree from an accredited institution.

- The three (3) letters of recommendation are expected from academic professionals to support the applicant's ability and character to succeed in the graduate degree.
- A statement of purpose is required to demonstrate writing ability and to describe the applicant's goals and how the educational specialist degree supports those goals.

Requirements for Educational Specialist Programs

- Students must complete a minimum of 32 semester hours of approved graduate coursework beyond the master's level with a minimum GPA of 3.0 on a 4.0 scale.
- Students are required to develop a plan of study with their advisor that specifies the coursework that must be completed to fulfill degree requirements. This plan must be filed prior to the completion of 15 semester hours and must be approved by the advisor, the department chairperson, and the college associate dean.
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- No more than a total of six semester hours of credit from any combination of workshops (7950), problems or special topics courses (7980) or independent studies (7990 or 8990) may be applied to a specialist's program.

MAE in Education and Economics

Admission to Master's Degree Programs

In addition to the College of Graduate Studies admission requirements, master's programs housed in the department of curriculum and instruction require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
- Three letters of recommendation regarding the prospective graduate student's potential for doing master's level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant's ability to engage in graduate work in the desired program.
- A well-written statement describing the student's background and goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

Requirements for Master's Degree Programs

Master's programs housed in the department of curriculum and instruction require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. 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.

- A plan of study identifying the courses for the master’s degree is required after 12 credit hours, generally at the end of the first semester of full time study.
- All students completing one of the master’s degrees in this department must fulfill core requirements by completing one course from each of the four foundations core areas within the first 18 semester hours of course work (four of the first six courses must be core courses).
- All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.
- The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

**MAE in Education and English**

**Admission to Master’s Degree Programs**

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
- Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
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Master’s programs housed in the department of curriculum and instruction require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. 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.

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- All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.
- The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

**MAE in Education and French**

**Admission to Master’s Degree Programs**

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
- Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

**Requirements for Master’s Degree Programs**

Master’s programs housed in the department of curriculum and instruction require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. 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.

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• All students completing one of the master’s degrees in this department must fulfill core requirements by completing one course from each of the four foundations core areas within the first 18 semester hours of course work (four of the first six courses must be core courses).
• All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.
• The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

MAE in Education and Geography

Admission to Master’s Degree Programs

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

• An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
• Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
• A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
• Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

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Master’s programs housed in the department of curriculum and instruction require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. 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.

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• All students completing one of the master’s degrees in this department must fulfill core requirements by completing one course from each of the four foundations core areas within the first 18 semester hours of course work (four of the first six courses must be core courses).
• All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.
Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

**MAE in Education and History**

**Admission to Master’s Degree Programs**

In addition to the College of Graduate Studies admission requirements, master's programs housed in the department of curriculum and instruction require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
- Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

**Requirements for Master’s Degree Programs**

Master’s programs housed in the department of curriculum and instruction require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. 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.

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- All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.
- The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

**MAE in Education and Mathematics**

**Admission to Master’s Degree Programs**

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
- Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

**Requirements for Master’s Degree Programs**

Master’s programs housed in the department of curriculum and instruction require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. 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.

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- The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.
MAE in Education and Sociology

Admission to Master’s Degree Programs

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

• An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.

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• A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.

• Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

Requirements for Master’s Degree Programs

Master’s programs housed in the department of curriculum and instruction require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. 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.

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• All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.

• The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

MAE in Education and Spanish

Admission to Master’s Degree Programs

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

• An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.

• Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.

• A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.

• Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

Requirements for Master’s Degree Programs

Master’s programs housed in the department of curriculum and instruction require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. 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.

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Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

MAE in English as Second Language
Admission to Master’s Degree Programs

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
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- The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

MAE in Political Science

This degree program is offered by the Judith Herb College of Education in collaboration with the College of Arts and Letters and the College of Natural Sciences and Mathematics. This degree is designed for students who wish to enhance their knowledge in a humanities or social sciences.
field and in education. As a general rule, students will have an advisor in the Judith Herb College of Education and in the collaborative College who will jointly plan and direct the program. Students who wish to complete their culminating experience in education will work with their Judith Herb College of Education advisor. Students who wish to complete their culminating experience in their humanities or social sciences field will work with their collaborative College advisor.

Admission to Master’s Degree Programs

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
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Requirements for Master’s Degree Programs

Master’s programs housed in the department of curriculum and instruction require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. 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.

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Specialization

Select a minimum of 15 semester hours in one of the following areas:

- anthropology
- classics
- economics
- English
- English as a second language
- French
- German
The master of arts and education ordinarily requires licensure as a prerequisite.

Master of Science and Education

This degree program is offered by the Judith Herb College of Education in collaboration with the College of Natural Science and Mathematics. The degree is designed for students who wish to enhance their knowledge in a science field and in education. As a general rule, students will have an advisor in the Judith Herb College of Education and in the College of Natural Science and Mathematics who will jointly plan and direct the program. Students who wish to complete their culminating experience in education will work with their Judith Herb College of Education advisor. Students who wish to complete their culminating experience in their science field or mathematics will work with their College of Natural Science and Mathematics advisor.

Admission to Master’s Degree Programs

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
- Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

Requirements for Master’s Degree Programs

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</table>
ME in Art Education

Licensure And Master’s Program (LAMP)

The licensure and master’s program (LAMP) is a unique program for providing an initial license for those individuals who are seeking a career change and are interested in becoming teachers. The LAMP provides a sequence of courses applicable to teacher licensure from the State of Ohio and may be combined with an appropriate master’s degree.

Licensure may be obtained in the following areas:

- adolescence to young adult education (grades 7-12),
- middle childhood education (grades 4-9),
- foreign language education (grades PK-12),
- art education (grades PK-12) and
- music education (grades PK-12).

The program is designed to provide the student with opportunities to spend time in school settings and to put these experiences into perspective through on-campus reflective seminars. Both one year and two year programs are available.

Admission requirements for Licensure And Master’s Program (LAMP)

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work.
- Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
- All teacher licensure candidates are required to demonstrate basic competencies in reading, writing and mathematics. Candidates must receive acceptable scores on one of the following nationally normed assessments:
  a. ACT
     i. 20 each on math, reading, and writing sections
  b. SAT
     i. math 510
     ii. reading 500
     iii. writing 490
  c. Praxis Core Academic Skills for Educators (CASE)
     i. mathematics (test code 5732): minimum score 150
     ii. reading (test code 5712): minimum score 156
     iii. writing (test code 5722): minimum score 162
  d. GRE
     i. verbal reasoning 151
     ii. quantitative reasoning 153
     iii. writing 4.0

(1 required beginning 2021)
LAMP programs in Art Education and Music Education
Licensure in both art education and music education are available for persons with appropriate fine arts backgrounds. Students should contact the College of Arts and Letters.

LAMP program in Foreign Language Education
Licensure in foreign language education is available for person with appropriate backgrounds in French, Spanish or German. Students should contact the Department of Foreign Languages.

Endorsements
• Career-based Intervention
• Early childhood generalist (grades 4-5)
• Reading (PreK-12)

Licensure Programs
• Adolescence to young adult (7-12)
• Art education (multi-age)
• Foreign language (multi-age)
• Middle grade (4-9)
• Music education (multi-age)
• Special education (multi-age)

Admission to Master’s Degree Programs
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AED 5320  The Art Museum And The Art/Humanities Educator
Select 18 hours 1

Culminating Experience
Select one of the following: 3
AED 5000  Research In Art Education
AED 6920  Masters Research Project In Art Education
AED 6940  Internship
AED 6960  Master’s Research Thesis In Art Education

Total Hours 36

1 Courses must be pre-approved by the faculty advisor.

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. See the description of the Licensure And Master’s Program (LAMP) section. Students should consult their advisor for detailed information.

ME in Career and Technical Education

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ME in Curriculum and Instruction

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<td>Curriculum Development: K-12</td>
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<td>CI 6830</td>
<td>Curriculum Trends And Issues</td>
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<td>SPED 5000</td>
<td>Issues In Special Education</td>
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Select one of the following: 3
CI 6490 Theory And Research In Literacy
CI 6590 Theory And Research In Mathematics Education
CI 6690 Theory And Research In Science Education
CI 6790 Theory And Research In Social Studies
CI 6890 Theory and Research in Learning and Teaching Content

Seminar, Project or Thesis
Select one of the following: 3
CI 6900 Masters Research Seminar In Curriculum And Instruction
CI 6920 Masters Research Project In Curriculum And Instruction
CI 6960 Masters Thesis In Curriculum And Instruction

Total Hours 30

1 Courses must be pre-approved by the faculty advisor.

ME in Educational Technology and Educational Technology and Performance Technology

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• A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.

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Code Title Hours
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Psychological Foundations
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Research Foundations
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Social Foundations
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<td>TSOC 5110</td>
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<td>TSOC 5200</td>
<td>Sociological Foundations Of Education</td>
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<td>TSOC 5210</td>
<td>Multicultural Non-Sexist Education</td>
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<tr>
<td>TSOC 5230</td>
<td>Intergroup And Intercultural Education</td>
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<tr>
<td>TSOC 5300</td>
<td>Philosophy And Education</td>
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<td>TSOC 5400</td>
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<td>TSOC 5500</td>
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Curriculum
ME in Middle Childhood Education

Licensure And Master’s Program (LAMP)

The licensure and master’s program (LAMP) is a unique program for providing an initial license for those individuals who are seeking a career change and are interested in becoming teachers. The LAMP provides a sequence of courses applicable to teacher licensure from the State of Ohio and may be combined with an appropriate master’s degree.

Licensure may be obtained in the following areas:

- adolescence to young adult education (grades 7-12),
- middle childhood education (grades 4-9),
- foreign language education (grades PK-12),
- art education (grades PK-12) and
- music education (grades PK-12).

The program is designed to provide the student with opportunities to spend time in school settings and to put these experiences into perspective through on-campus reflective seminars. Both one year and two year programs are available.

Admission requirements for Licensure And Master’s Program (LAMP)

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work.
- Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
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- All teacher licensure candidates are required to demonstrate basic competencies in reading, writing and mathematics. Candidates must receive acceptable scores on one of the following nationally normed assessments:
  a. ACT
     i 20 each on math, reading, and writing sections
  b. SAT
     i math 510
     ii reading 500
     iii writing 490
  c. Praxis Core Academic Skills for Educators (CASE)
     i mathematics (test code 5732): minimum score 150
     ii reading (test code 5712): minimum score 156
     iii writing (test code 5722): minimum score 162
  d. GRE
     i verbal reasoning 151
     ii quantitative reasoning 153
     iii writing 4.0 (required beginning 2021)

LAMP in Middle Grades (MGE) and Adolescent/Young Adult Education (AYA), one and two year options.

LAMP is a highly selective master’s program that combines licensure in the middle grades (grades 4-9) with a master’s degree in middle childhood education (MIDD) or licensure in adolescence to young adult education (grades 7-12) with a master’s degree in secondary education (SECE). The one-year program is a one calendar year (August to August) full-time cohort-based program. The two-year option begins each spring semester. Please see the LAMP website link from the Department of Curriculum and Instruction web page for further details on both programs.

LAMP programs in Art Education and Music Education

Licensure in both art education and music education are available for persons with appropriate fine arts backgrounds. Students should contact the College of Arts and Letters.

LAMP program in Foreign Language Education

Licensure in foreign language education is available for person with appropriate backgrounds in French, Spanish or German. Students should contact the Department of Foreign Languages.
Endorsements

- Career-based Intervention
- Early childhood generalist (grades 4-5)
- Reading (PreK-12)

Licensure Programs

- Adolescence to young adult (7-12)
- Art education (multi-age)
- Foreign language (multi-age)
- Middle grade (4-9)
- Music education (multi-age)
- Special education (multi-age)

Admission to Master’s Degree Programs

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Specialization

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ME in Secondary Education
(Adolescence to Young Adult Education)

(LAMP only)

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<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>SPED 5000</td>
<td>Issues In Special Education (recommended)</td>
<td>3</td>
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<tr>
<td>CI 5870</td>
<td>Secondary School Curriculum</td>
<td></td>
</tr>
<tr>
<td>CI 6800</td>
<td>Foundations Of Curriculum &amp; Instruction</td>
<td></td>
</tr>
<tr>
<td>CI 6810</td>
<td>Curriculum Development: K-12</td>
<td></td>
</tr>
<tr>
<td>CI 6830</td>
<td>Curriculum Trends And Issues</td>
<td></td>
</tr>
<tr>
<td>CI 6840</td>
<td>Curriculum For Educational Leaders</td>
<td></td>
</tr>
<tr>
<td>ETPT 5100</td>
<td>Instructional Systems Design Principles</td>
<td></td>
</tr>
</tbody>
</table>

Specialization
Select one of the following areas of focus: 12

English/language arts
MM in Music Education

Admission to Master’s Degree Programs

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
- Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

Requirements for Master’s Degree Programs

Master’s programs housed in the department of curriculum and instruction require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. 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.

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- All students completing one of the master’s degrees in this department must fulfill core requirements by completing one course from each of the four foundations core areas within the first 18 semester hours of course work (four of the first six courses must be core courses).
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- The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>MED 5360</td>
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<tr>
<td>MUS 5900</td>
<td>Graduate Studies In Music</td>
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<td>MED 5340</td>
<td>Curriculum Development In Music Education</td>
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<td>MED 5370</td>
<td>Psychology Of Music</td>
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<td>MUS 5900</td>
<td>Graduate Studies In Music</td>
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</tr>
<tr>
<td>MED 5920</td>
<td>Master’s Research Project In Music Education</td>
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</tr>
<tr>
<td>MED 6960</td>
<td>Master’s Research Thesis In Music Education</td>
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<tr>
<td>Total Hours</td>
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</table>

1 Courses must be approved by the faculty advisor.

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their advisor for detailed information.

MSE in Education and Biology

This degree program is offered by the Judith Herb College of Education in collaboration with the College of Natural Science and Mathematics. The degree is designed for students who wish to enhance their knowledge...
in a science field and in education. As a general rule, students will have an advisor in the Judith Herb College of Education and in the College of Natural Science and Mathematics who will jointly plan and direct the program. Students who wish to complete their culminating experience in education will work with their Judith Herb College of Education advisor. Students who wish to complete their culminating experience in their science field or mathematics will work with their College of Natural Science and Mathematics advisor.

**Admission to Master’s Degree Programs**

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

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### Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

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<th>Code</th>
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<tr>
<td></td>
<td><strong>Foundations Core</strong></td>
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<td><strong>Psychological Foundations</strong></td>
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<td>Select one of the following:</td>
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<tr>
<td>EDP 5110</td>
<td>Basic Educational Psychology</td>
<td></td>
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<tr>
<td>EDP 5120</td>
<td>Alternative Approaches To Discipline</td>
<td></td>
</tr>
<tr>
<td>EDP 5210</td>
<td>Child Behavior And Development</td>
<td></td>
</tr>
<tr>
<td>EDP 5220</td>
<td>Adolescent Behavior And Development</td>
<td></td>
</tr>
<tr>
<td>EDP 5230</td>
<td>Adult Development</td>
<td></td>
</tr>
<tr>
<td>EDP 5310</td>
<td>Issues And Innovations In Learning And Instruction</td>
<td></td>
</tr>
<tr>
<td>EDP 5320</td>
<td>Instructional Psychology</td>
<td></td>
</tr>
<tr>
<td>EDP 5330</td>
<td>Behavior Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Research Foundations</strong></td>
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<td>RESM 5110</td>
<td>Quantitative Methods I</td>
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<tr>
<td>RESM 5210</td>
<td>Educational Testing And Grading</td>
<td></td>
</tr>
<tr>
<td>RESM 5310</td>
<td>Educational Research</td>
<td></td>
</tr>
<tr>
<td>RESM 5330</td>
<td>Qualitative Research I: Introduction And Basic Methods</td>
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<tr>
<td></td>
<td><strong>Social Foundations</strong></td>
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<tr>
<td>Select one of the following:</td>
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<td>TSOC 5100</td>
<td>Group Processes In Education</td>
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<tr>
<td>TSOC 5110</td>
<td>Modern Educational Controversies</td>
<td></td>
</tr>
<tr>
<td>TSOC 5200</td>
<td>Sociological Foundations Of Education</td>
<td></td>
</tr>
<tr>
<td>TSOC 5210</td>
<td>Multicultural Non-Sexist Education</td>
<td></td>
</tr>
<tr>
<td>TSOC 5230</td>
<td>Intergroup And Intercultural Education</td>
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<tr>
<td>TSOC 5300</td>
<td>Philosophy And Education</td>
<td></td>
</tr>
<tr>
<td>TSOC 5400</td>
<td>History Of Schooling &amp; Teaching In The U.s.</td>
<td></td>
</tr>
<tr>
<td>TSOC 5500</td>
<td>Anthropology and Education</td>
<td></td>
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<td></td>
<td><strong>Curriculum</strong></td>
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<td>Select one of the following:</td>
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<tr>
<td>CI 6830</td>
<td>Curriculum Trends And Issues (recommended)</td>
<td></td>
</tr>
<tr>
<td>CI 6800</td>
<td>Foundations Of Curriculum &amp; Instruction</td>
<td></td>
</tr>
<tr>
<td>CI 6810</td>
<td>Curriculum Development: K-12</td>
<td></td>
</tr>
<tr>
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<td>Curriculum For Educational Leaders</td>
<td></td>
</tr>
<tr>
<td>ETPT 5100</td>
<td>Instructional Systems Design Principles (as approved by advisor)</td>
<td></td>
</tr>
<tr>
<td>SPED 5000</td>
<td>Issues In Special Education</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Specialization</strong></td>
<td></td>
</tr>
<tr>
<td>Select a minimum of 15 semester hours in one of the following:</td>
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<tr>
<td>biology</td>
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<tr>
<td>chemistry</td>
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<tr>
<td>geology</td>
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<tr>
<td>mathematics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>physics</td>
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</tbody>
</table>
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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<td>CI 6490</td>
<td>Theory And Research In Literacy</td>
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</tr>
<tr>
<td>CI 6590</td>
<td>Theory And Research In Mathematics Education</td>
<td></td>
</tr>
<tr>
<td>CI 6690</td>
<td>Theory And Research In Science Education</td>
<td></td>
</tr>
<tr>
<td>CI 6790</td>
<td>Theory And Research In Social Studies</td>
<td></td>
</tr>
<tr>
<td>CI 6890</td>
<td>Theory and Research in Learning and Teaching Content (approved by advisor)</td>
<td></td>
</tr>
<tr>
<td>CI 6900</td>
<td>Masters Research Seminar In Curriculum And Instruction</td>
<td></td>
</tr>
<tr>
<td>CI 6920</td>
<td>Masters Research Project In Curriculum And Instruction</td>
<td></td>
</tr>
<tr>
<td>CI 6960</td>
<td>Masters Thesis In Curriculum And Instruction</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours 27

1 Refer to Graduate Programs in College of Natural Science and Mathematics (p. 231) for specific course requirements for dual degree programs. Courses must be pre-approved by the faculty advisor.

*THE UNIVERSITY OF TOLEDO*

1872
MSE in Education and Geology

This degree program is offered by the Judith Herb College of Education in collaboration with the College of Natural Science and Mathematics. The degree is designed for students who wish to enhance their knowledge in a science field or mathematics will work with their College of Natural Science and Mathematics advisor.

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td>Psychological Foundations</td>
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### MSE in Education and Mathematics

**Select one of the following:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>EDP 5110</td>
<td>Basic Educational Psychology</td>
</tr>
<tr>
<td>EDP 5120</td>
<td>Alternative Approaches To Discipline</td>
</tr>
<tr>
<td>EDP 5210</td>
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<td>EDP 5330</td>
<td>Behavior Management</td>
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</table>

**Research Foundations**

Select one of the following:

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>RESM 5110</td>
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</tr>
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<tr>
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<td>Educational Research</td>
</tr>
<tr>
<td>RESM 5330</td>
<td>Qualitative Research I: Introduction And Basic Methods</td>
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</table>

**Social Foundations**

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>TSOC 5100</td>
<td>Group Processes In Education</td>
</tr>
<tr>
<td>TSOC 5110</td>
<td>Modern Educational Controversies</td>
</tr>
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</tr>
<tr>
<td>TSOC 5500</td>
<td>Anthropology and Education</td>
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**Curriculum**

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI 6830</td>
<td>Curriculum Trends And Issues (recommended)</td>
</tr>
<tr>
<td>CI 6800</td>
<td>Foundations Of Curriculum &amp; Instruction</td>
</tr>
<tr>
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<td>Curriculum Development: K-12</td>
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<td>CI 6840</td>
<td>Curriculum For Educational Leaders</td>
</tr>
<tr>
<td>ETPT 5100</td>
<td>Instructional Systems Design Principles (as approved by advisor)</td>
</tr>
<tr>
<td>SPED 5000</td>
<td>Issues In Special Education</td>
</tr>
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</table>

**Specialization**

Select a minimum of 15 semester hours in one of the following: 1

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>biology</td>
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<tr>
<td>chemistry</td>
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<tr>
<td>geology</td>
<td></td>
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<tr>
<td>mathematics</td>
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<td>physics</td>
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**Theory and Research Requirement**

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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CI 6490</td>
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<td>Theory And Research In Social Studies</td>
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<td>CI 6890</td>
<td>Theory and Research in Learning and Teaching Content (approved by advisor)</td>
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</table>

**Seminar, Project or Thesis**

<table>
<thead>
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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CI 6900</td>
<td>Masters Research Seminar In Curriculum And Instruction</td>
</tr>
<tr>
<td>CI 6920</td>
<td>Masters Research Project In Curriculum And Instruction</td>
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</tr>
</tbody>
</table>

Total Hours: 27

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**MSE in Education and Mathematics**

(not accepting applications)

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Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td></td>
<td><strong>Foundations Core</strong></td>
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<td>EDP 5110</td>
<td>Basic Educational Psychology</td>
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<tr>
<td>EDP 5120</td>
<td>Alternative Approaches To Discipline</td>
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<td>Child Behavior And Development</td>
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<tr>
<td>EDP 5220</td>
<td>Adolescent Behavior And Development</td>
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<td>Adult Development</td>
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<tr>
<td>EDP 5310</td>
<td>Issues And Innovations In Learning And Instruction</td>
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<td>EDP 5320</td>
<td>Instructional Psychology</td>
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<tr>
<td>EDP 5330</td>
<td>Behavior Management</td>
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<td></td>
<td><strong>Research Foundations</strong></td>
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<td>RESM 5110</td>
<td>Quantitative Methods I</td>
<td></td>
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<tr>
<td>RESM 5210</td>
<td>Educational Testing And Grading</td>
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<tr>
<td>RESM 5310</td>
<td>Educational Research</td>
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<tr>
<td>RESM 5330</td>
<td>Qualitative Research I: Introduction And Basic Methods</td>
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<td><strong>Social Foundations</strong></td>
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<td>TSOC 5100</td>
<td>Group Processes In Education</td>
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<td>TSOC 5110</td>
<td>Modern Educational Controversies</td>
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<td>TSOC 5200</td>
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<td>TSOC 5210</td>
<td>Multicultural Non-Sexist Education</td>
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<td>TSOC 5230</td>
<td>Intergroup And Intercultural Education</td>
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<td>TSOC 5300</td>
<td>Philosophy And Education</td>
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<td>TSOC 5400</td>
<td>History Of Schooling &amp; Teaching In The U.s.</td>
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<tr>
<td>TSOC 5500</td>
<td>Anthropology and Education</td>
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<td><strong>Curriculum</strong></td>
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<tr>
<td>CI 6830</td>
<td>Curriculum Trends And Issues (recommended)</td>
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<tr>
<td>CI 6800</td>
<td>Foundations Of Curriculum &amp; Instruction</td>
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<td>CI 6810</td>
<td>Curriculum Development: K-12</td>
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<td>CI 6840</td>
<td>Curriculum For Educational Leaders</td>
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<tr>
<td>ETPT 5100</td>
<td>Instructional Systems Design Principles (as approved by advisor)</td>
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<td>SPED 5000</td>
<td>Issues In Special Education</td>
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<td>chemistry</td>
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<td></td>
<td>geology</td>
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<td>mathematics</td>
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<td>physics</td>
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<td><strong>Theory and Research Requirement</strong></td>
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<td>CI 6490</td>
<td>Theory And Research In Literacy</td>
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<td>CI 6590</td>
<td>Theory And Research In Mathematics Education</td>
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<tr>
<td>CI 6690</td>
<td>Theory And Research In Science Education</td>
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<td>CI 6790</td>
<td>Theory And Research In Social Studies</td>
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<tr>
<td>CI 6890</td>
<td>Theory and Research In Learning and Teaching Content (approved by advisor)</td>
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<tr>
<td></td>
<td><strong>Seminar, Project or Thesis</strong></td>
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<tr>
<td>CI 6900</td>
<td>Masters Research Seminar In Curriculum And Instruction</td>
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<td>CI 6920</td>
<td>Masters Research Project In Curriculum And Instruction</td>
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<tr>
<td>CI 6960</td>
<td>Masters Thesis In Curriculum And Instruction</td>
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<td></td>
<td><strong>Total Hours</strong></td>
<td>27</td>
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</tbody>
</table>

1 Refer to Graduate Programs in College of Natural Science and Mathematics (p. 231) for specific course requirements for dual degree programs. Courses must be pre-approved by the faculty advisor.

**MSE in Education and Physics**

This degree program is offered by the Judith Herb College of Education in collaboration with the College of Natural Science and Mathematics. The degree is designed for students who wish to enhance their knowledge in a science field and in education. As a general rule, students will have an advisor in the Judith Herb College of Education and in the College of Natural Science and Mathematics who will jointly plan and direct the program. Students who wish to complete their culminating experience in education will work with their Judith Herb College of Education advisor. Students who wish to complete their culminating experience in their science field or mathematics will work with their College of Natural Science and Mathematics advisor.
Admission to Master’s Degree Programs

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the department of curriculum and instruction require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
- Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

Requirements for Master’s Degree Programs

Master’s programs housed in the department of curriculum and instruction require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. 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.

- A plan of study identifying the courses for the master’s degree is required after 12 credit hours, generally at the end of the first semester of full time study.
- All students completing one of the master’s degrees in this department must fulfill core requirements by completing one course from each of the four foundations core areas within the first 18 semester hours of course work (four of the first six courses must be core courses).
- All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.
- The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill the licensure credential as well as degree requirements.

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<td>Child Behavior And Development</td>
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<tr>
<td>EDP 5330</td>
<td>Behavior Management</td>
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</table>

Research Foundations

Select one of the following:

- RESM 5110 Quantitative Methods I
- RESM 5210 Educational Testing And Grading
- RESM 5310 Educational Research
- RESM 5330 Qualitative Research I: Introduction And Basic Methods

Social Foundations

Select one of the following:

- TSOC 5100 Group Processes In Education
- TSOC 5110 Modern Educational Controversies
- TSOC 5200 Sociological Foundations Of Education
- TSOC 5210 Multicultural Non-Sexist Education
- TSOC 5230 Intergroup And Intercultural Education
- TSOC 5300 Philosophy And Education
- TSOC 5400 History Of Schooling & Teaching In The U.s.
- TSOC 5500 Anthropology and Education

Curriculum

Select one of the following:

- CI 6830 Curriculum Trends And Issues (recommended)
- CI 6800 Foundations Of Curriculum & Instruction
- CI 6810 Curriculum Development: K-12
- CI 6840 Curriculum For Educational Leaders
- ETPT 5100 Instructional Systems Design Principles (as approved by advisor)
- SPED 5000 Issues In Special Education

Specialization

Select a minimum of 15 semester hours in one of the following:

- biology
- chemistry
- geology
- mathematics
- physics

Theory and Research Requirement

- CI 6490 Theory And Research In Literacy
- CI 6590 Theory And Research In Mathematics Education
- CI 6690 Theory And Research In Science Education
- CI 6790 Theory And Research In Social Studies
- CI 6890 Theory and Research in Learning and Teaching Content (approved by advisor)

Seminar, Project or Thesis

- CI 6900 Masters Research Seminar In Curriculum And Instruction
The doctoral program committee has a The doctoral program committee shall be formed before the student committee.

This advisor guides the student in forming a doctoral program Academic Advising Committee

Requirements for Doctoral Programs

The plan of study must be approved by the doctoral program committee, the department chairperson, and the associate dean of the college. The plan of study must be filed before 18 semester hours of the doctoral program are completed; and revisions to the original plan of study should be timely updated with the College of Graduate Studies the semester a revision occurs. After completion of the academic requirements, major/minor examinations and oral defense of the major/ minor examinations, the student must form a dissertation committee to guide the development of the dissertation proposal and ultimately the dissertation.

All coursework and requirements of the doctoral degree must be completed within the seven year period preceding the awarding of the degree.

PhD in Curriculum and Instruction: Early Childhood

Admission to Doctoral Programs

Individuals applying for admission to doctoral study must meet the admission requirements of the College of Graduate Studies as well as specific program requirements.

- Acceptable GRE scores with 144 in both the verbal and quantitative sections and a 3.0 writing score or above preferred.
- Evidence in prerequisite academic work that the applicant can successfully complete the doctoral program in the area of study.
- An autobiographical sketch that describes why the applicant wishes to pursue the selected doctoral program. This sketch also should include 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 the applicant believes is relevant for admission into the desired program.
- Evidence of research and writing ability. Such evidence may include 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 in this respect.

Requirements for Doctoral Programs

A minimum of 60 hours of doctoral level coursework (7000/8000 level) is required. Each doctoral student is expected to:

- Identify a concentration in one area of specialization (i.e., a major) and pass a written examination (major examination) that covers the major area of concentration;
- Demonstrate proficiency in tools of research;
- After passing the written major examination, pass an oral examination;
- Present and defend a dissertation proposal;
- Present and defend a completed dissertation in a public forum.

Academic Advising Committee

The student is assigned an initial advisor upon admission to a program. This advisor guides the student in forming a doctoral program committee.

The doctoral program committee shall be formed before the student completes 18 hours of credit. 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 doctoral major exam, any minor exam(s) and doctoral program oral exams.

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PhD in Curriculum and Instruction: Early Childhood

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All coursework and requirements of the doctoral degree must be completed within the seven year period preceding the awarding of the degree.

PhD in Curriculum and Instruction: Educational Technology
Admission to Doctoral Programs
Individuals applying for admission to doctoral study must meet the admission requirements of the College of Graduate Studies as well as specific program requirements.

• Acceptable GRE scores with 144 in both the verbal and quantitative sections and a 3.0 writing score or above preferred.
• Evidence in prerequisite academic work that the applicant can successfully complete the doctoral program in the area of study.

• An autobiographical sketch that describes why the applicant wishes to pursue the selected doctoral program. This sketch also should include 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 the applicant believes is relevant for admission into the desired program.
• Evidence of research and writing ability. Such evidence may include 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 in this respect.

Requirements for Doctoral Programs
A minimum of 60 hours of doctoral level coursework (7000/8000 level) is required. Each doctoral student is expected to:

• Identify a concentration in one area of specialization (i.e., a major) and pass a written examination (major examination) that covers the major area of concentration;
• Demonstrate proficiency in tools of research;
• After passing the written major examination, pass an oral examination;
• Present and defend a dissertation proposal;
• Present and defend a completed dissertation in a public forum.

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All coursework and requirements of the doctoral degree must be completed within the seven year period preceding the awarding of the degree.

**PhD in Curriculum and Instruction: Gifted and Talented**

**Admission to Doctoral Programs**

Individuals applying for admission to doctoral study must meet the admission requirements of the College of Graduate Studies as well as specific program requirements.

- Acceptable GRE scores with 144 in both the verbal and quantitative sections and a 3.0 writing score or above preferred.
- Evidence in prerequisite academic work that the applicant can successfully complete the doctoral program in the area of study.
- An autobiographical sketch that describes why the applicant wishes to pursue the selected doctoral program. This sketch also should include 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 the applicant believes is relevant for admission into the desired program.
- Evidence of research and writing ability. Such evidence may include 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 in this respect.

**Requirements for Doctoral Programs**

A minimum of 60 hours of doctoral level coursework (7000/8000 level) is required. Each doctoral student is expected to:

- Identify a concentration in one area of specialization (i.e., a major) and pass a written examination (major examination) that covers the major area of concentration;
- Demonstrate proficiency in tools of research;
- After passing the written major examination, pass an oral examination;
- Present and defend a dissertation proposal;
- Present and defend a completed dissertation in a public forum.

**Academic Advising Committee**

The student is assigned an initial advisor upon admission to a program. This advisor guides the student in forming a doctoral program committee.

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All coursework and requirements of the doctoral degree must be completed within the seven year period preceding the awarding of the degree.

**PhD in Curriculum and Instruction: Secondary Education**

**Admission to Doctoral Programs**

Individuals applying for admission to doctoral study must meet the admission requirements of the College of Graduate Studies as well as specific program requirements.

- Acceptable GRE scores with 144 in both the verbal and quantitative sections and a 3.0 writing score or above preferred.
- Evidence in prerequisite academic work that the applicant can successfully complete the doctoral program in the area of study.
- An autobiographical sketch that describes why the applicant wishes to pursue the selected doctoral program. This sketch also should include 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 the applicant believes is relevant for admission into the desired program.
- Evidence of research and writing ability. Such evidence may include 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 in this respect.

**Requirements for Doctoral Programs**

A minimum of 60 hours of doctoral level coursework (7000/8000 level) is required. Each doctoral student is expected to:

- Identify a concentration in one area of specialization (i.e., a major) and pass a written examination (major examination) that covers the major area of concentration;
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All coursework and requirements of the doctoral degree must be completed within the seven year period preceding the awarding of the degree.

PhD in Curriculum and Instruction: Special Education

Admission to Doctoral Programs
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Requirements for Doctoral Programs
A minimum of 60 hours of doctoral level coursework (7000/8000 level) is required. Each doctoral student is expected to:

- Identify a concentration in one area of specialization (i.e., a major) and pass a written examination (major examination) that covers the major area of concentration;
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All coursework and requirements of the doctoral degree must be completed within the seven year period preceding the awarding of the degree.
Department of Early Childhood, Higher Education, and Special Education

Robert Schultz, interim chair

Programs housed in this department include graduate programs in early childhood education, higher education, and special education (intervention specialist licenses in mild/moderate, moderate/intensive; Ohio DD early intervention certificate). In addition, teacher licensure requirements may be obtained in early childhood education or special education in conjunction with the master's degree. These programs are available at the master, education specialist (6th year program) and doctoral level. Endorsements are also available in the areas of early intervention, pre-school special needs, and transition to work. Graduate certificates are available at the master's level in diversity, higher education administration, and interprofessional teaming in early childhood.

Educational programs at The University of Toledo are accredited by the Council for Accreditation of Educator Preparation (CAEP).

Degrees Offered

- Diversity Certificate (p. 352)
- EdS in Special Education (p. 352)
- Graduate Certificate in Interprofessional Teaming in Early Childhood (p. 353)
- Master of Education in Early Childhood Education PreK-3 (p. 353)
- Master of Education in Higher Education (p. 355)
- Master of Education in Special Education (p. 357)
- PhD in Curriculum and Instruction: Emphasis in Early Childhood (p. 359)
- PhD in Curriculum and Instruction: Emphasis in Special Education (p. 360)
- PhD in Early Childhood Education, Higher Education, & Special Education (p. 361)
- PhD in Higher Education (p. 361)

CIEC 5000 Ece: Philosophy And Practice
[3 credit hours (3, 0, 0)]
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, Fall

CIEC 5070 Effective Teaching Practices: Pre-K To 3rd Grade
[3 credit hours (3, 0, 0)]
Applies characteristics of best practice to curriculum development and implementation with adherence to national and state curriculum standards as they apply to children, age 3 to 8, with diverse educational needs.
Prerequisites: (EDP 5210 and CIEC 5000)
Term Offered: Spring, Fall

CIEC 5150 Setting The Stage For Early Childhood Learning: Inspirations From Reggio Emilia
[3 credit hours (0, 0, 15)]
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 (3, 0, 0)]
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 (2,5, 0, 0)]
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
Term Offered: Spring, Fall

CIEC 5380 Field Experience Cohort I
[3 credit hours (0, 0, 8)]
This course aligns with the graduate Cohort II coursework (CIEC 5070).
Prerequisites: EDP 5210
Corequisites: CIEC 5070
Term Offered: Spring, Fall

CIEC 5460 Science Methods For Early Childhood Education
[3 credit hours (3, 0, 0)]
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 discoveries. Students will learn how to assess the scientific thinking of young children appropriately, using formal and informal strategies.
Term Offered: Spring, Fall

CIEC 5480 Field Experience Cohort II
[3 credit hours (3, 0, 0)]
This course aligns with all graduate-level Cohort II coursework in the early childhood teacher education licensure program.
Corequisites: CIEC 5460
Term Offered: Spring, Fall

CIEC 5520 Multisensory Experiences
[3 credit hours (3, 0, 0)]
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 5530 Affective Experiences
[3 credit hours (3, 0, 0)]
This course focuses on teacher planning and activities that support the socio-emotional development of young children.

CIEC 5540 Prekindergarten Programs
[3 credit hours (3, 0, 0)]
Focuses on the successful operations of an early childhood program. Covers topics such as licensing and certification standards, staff development, and purchase of equipment and proper food and health services.

CIEC 5550 Teaching Methods For Early Childhood Social Studies
[3 credit hours (2.5, 0, 0)]
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 5000 and EDP 5210)
Term Offered: Spring, Fall

CIEC 5580 Practicum: Infant/Toddler
[1 credit hour (0, 0, 4)]
Practicum experience in infant/toddler settings where students will observe, plan, implement, and evaluate activities.

CIEC 5590 Infant Toddler/Seminar
[2 credit hours (0, 0, 2)]
Planning, research, teacher-made materials appropriate for environments for infants and toddlers will be covered.

CIEC 5610 Seminar I: Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
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 5270
Term Offered: Summer

CIEC 5620 Seminar II: Working Effectively with Team Members
[1 credit hour (0, 0, 1)]
Factors that support and threaten interprofessional collaboration. Become aware of policies affecting teaming. Engage in advocacy for teaming that will benefit individuals with disabilities.
Prerequisites: CIEC 5610 and CIEC 5270
Term Offered: Summer, Fall

CIEC 5630 Seminar III: Evidence-Based Practice and Innovation in Teaming
[1 credit hour (0, 0, 1)]
Issues related to principles of ethical practice, professional identity and advocacy. Ways in which technology can promote effective teaming practices with other professionals as well as with family members.
Prerequisites: CIEC 5620
Corequisites: CIEC 5640
Term Offered: Summer

CIEC 5640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
Students will work as part of an inter-professional team to develop, implement, and evaluate integrated intervention plans designed to support the development of children who have special needs.
Prerequisites: CIEC 5620
Corequisites: CIEC 5630

CIEC 5770 Field Experience Cohort III
[3 credit hours (0, 0, 8)]
This course aligns with all Cohort III coursework in the early childhood education program.
Prerequisites: (CIEC 5070 and EDP 3210) or (CIEC 5070 and EDP 5210) or (CIEC 4070 and EDP 3210)
Term Offered: Spring, Fall

CIEC 5800 Teacher/Parent Child Relations
[3 credit hours (3, 0, 0)]
This course is designed to assist the classroom teacher in building positive relationships with the parents of students and to develop effective strategies for communicating with them.

CIEC 5950 Workshop In Early Childhood Education
[1-5 credit hours (0, 0, 0-3)]
Workshops developed around topics of interest and concern to inservice teachers. Practical application of workshop topics will be emphasized. Students may include several workshops in their master's or specialist degree programs.

CIEC 5980 Special Topics In Early Childhood Education
[1-5 credit hours (0-5, 0, 0)]
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, Fall

CIEC 5990 Graduate Independent Study In Early Childhood Education
[1-5 credit hours (0, 0, 0-5)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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: Summer
CIEC 6330 Language And Concept Development
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0-3)]
Examination of research and current issues in early childhood education. Emphasis on theory and research and evaluation models.
Prerequisites: CIEC 6950
Term Offered: Spring

CIEC 6920 Masters Research Project In Early Childhood Education
[1-3 credit hours (0, 0, 0-3)]
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 In Early Childhood
[1-12 credit hours (0, 0, 0-12)]
Placement of a Master's student in an appropriate PreK-Grade 3 school setting under the direction of a CIEC instructor. A maximum of 3 hours can be applied towards a masters degree.
Term Offered: Spring, Fall

CIEC 6950 Theory And Research In Early Childhood
[3 credit hours (3, 0, 0)]
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 6960 Masters Thesis In Early Childhood Education
[1-3 credit hours (0, 0, 0-3)]
Students who elect this option will complete a thesis under the direction of committee of at least two faculty members from Early Childhood Education, ordinarily including the faculty advisor.

CIEC 7610 Seminar I: Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
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
Term Offered: Summer

CIEC 7620 Seminar II: Working Effectively with Team Members
[1 credit hour (0, 0, 1)]
Factors that support and threaten interprofessional collaboration.
Become aware of policies affecting teaming. Engage in advocacy for teaming that will benefit individuals with disabilities.
Prerequisites: CIEC 7610 and CIEC 7270
Term Offered: Summer

CIEC 7630 Seminar III: Evidence-Based Practice and Innovation in Teaming
[1 credit hour (0, 0, 1)]
Issues related to principles of ethical practice, professional identity and advocacy. Ways in which technology can promote effective teaming practices with other professionals as well as with family members.
Prerequisites: CIEC 7620
Corequisites: CIEC 7640
Term Offered: Spring, Summer

CIEC 7640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
Students will work as part of an inter-professional team to develop, implement, and evaluate integrated intervention plans designed to support the development of children who have special needs.
Prerequisites: CIEC 7620
Corequisites: CIEC 7630

CIEC 7800 Teacher/Parent Child Relations
[3 credit hours (3, 0, 0)]
This course is designed to assist the classroom teacher in building positive relationships with the parents of students and to develop effective strategies for communicating with them.

CIEC 7940 Specialist Practicum In Early Childhood Education
[1-3 credit hours (0, 0, 0-3)]
Observation and supervised experience in an appropriate setting. Students will be assigned to work as interns under the joint supervision of school and University personnel.

CIEC 7980 Special Topics In Early Childhood Education
[1-5 credit hours (0-5, 0, 0)]
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 8310 Pre-K/Primary Curriculum
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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: Summer
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Term Offered</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>CIEC 8330</td>
<td>Language And Concept Development</td>
<td>3</td>
<td>Spring, Summer, Fall</td>
<td>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</td>
</tr>
<tr>
<td>CIEC 8340</td>
<td>Curriculum Design For Infants And Toddlers</td>
<td>3</td>
<td>Summer</td>
<td>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: Summer</td>
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<tr>
<td>CIEC 8750</td>
<td>Developmental And Classroom Assessment</td>
<td>3</td>
<td>Spring, Summer, Fall</td>
<td>Focuses upon teaching and learning in a developmental learning environment. Emphasis includes observing the developmental characteristics of young children and assessment for prescriptive teaching. Term Offered: Spring, Summer, Fall</td>
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<tr>
<td>CIEC 8900</td>
<td>Doctoral Seminar In Early Childhood Education</td>
<td>2-4</td>
<td>Fall</td>
<td>This seminar will consider problems and provide advanced study for doctoral students in Early Childhood Education. Term Offered: Fall</td>
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<tr>
<td>CIEC 8930</td>
<td>Independent Research In Early Childhood Education</td>
<td>1-5</td>
<td>Spring, Summer, Fall</td>
<td>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</td>
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<tr>
<td>CIEC 8940</td>
<td>Doctoral Internship In Early Childhood</td>
<td>1-3</td>
<td>Spring</td>
<td>Placement of doctoral students in an appropriate PreK-Grade 3 school, school district or other professional setting under the direction of joint placement personnel and CIEC faculty. Term Offered: Spring</td>
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<tr>
<td>CIEC 8950</td>
<td>Theory And Research In Early Childhood</td>
<td>3</td>
<td>Spring</td>
<td>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: Spring</td>
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<tr>
<td>CIEC 8960</td>
<td>Dissertation In Early Childhood Education</td>
<td>1-12</td>
<td>Spring, Summer, Fall</td>
<td>Original research in an area of early childhood education. Term Offered: Spring, Summer, Fall</td>
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<tr>
<td>HED 5910</td>
<td>Diversity Beginnings</td>
<td>3</td>
<td>Fall</td>
<td>This course will review and apply diversity-related theory, social and psychological understanding, and interpersonal communication to diversity experiences. The course is designed to cultivate an awareness of diversity through communication in education, work, and social settings. Term Offered: Fall</td>
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<tr>
<td>HED 5920</td>
<td>Introduction to Master's Studies in Higher Education</td>
<td>1-3</td>
<td>Fall</td>
<td>This course explores the expectations and challenges of graduate education. We will look at the role of the graduate student, faculty, adviser, and other university offices that support your journey. Term Offered: Fall</td>
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<tr>
<td>HED 5930</td>
<td>Interdisciplinary Seminar</td>
<td>3</td>
<td>Spring</td>
<td>This seminar formatted course will provide the opportunity to explore problems and issues from the perspectives of the various fields of education and of other disciplines related to higher education. Term Offered: Spring</td>
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<tr>
<td>HED 5950</td>
<td>Workshop In Higher Education</td>
<td>1-3</td>
<td>Spring, Summer, Fall</td>
<td>Each workshop is developed on a topic of interest to faculty members and administrators of higher education institutions. Practical applications of the workshop topic will be emphasized. Term Offered: Spring</td>
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<tr>
<td>HED 5960</td>
<td>Diversity in Practice</td>
<td>3</td>
<td>Spring</td>
<td>This course is designed to explore dimensions of diversity in different settings like that of health care. Dimensions of diversity will include but are not limited to topics of global citizenship, socioeconomic diversity, religious diversity, gender and gender identity, LBGTQ, ADA laws, race and ethnicity, successful aging, and harassment and bullying. Term Offered: Spring</td>
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<tr>
<td>HED 5970</td>
<td>Diversity Advancement</td>
<td>3</td>
<td>Spring</td>
<td>This course is designed to teach how to measure effectiveness of diversity-related programs, review of tools and instruments for strategic planning, creation and implementation of diversity plans, and exploration of components of being an effective Chief Diversity Officer (CDO). Term Offered: Summer</td>
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<tr>
<td>HED 5980</td>
<td>Special Topics In Higher Education</td>
<td>1-3</td>
<td>Summer, Fall</td>
<td>This seminar provides advanced study in special topics of interest to faculty and administrators in higher education. Term Offered: Summer, Fall</td>
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<tr>
<td>HED 6010</td>
<td>History Of Higher Education</td>
<td>3</td>
<td>Summer, Fall</td>
<td>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</td>
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</table>
HED 6120 International Education  
[3 credit hours (0, 3, 0)]  
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 6210 The Community College  
[3 credit hours (3, 0, 0)]  
A study of the history, distinguishing characteristics (mission, functions, organization, curriculum, finances) and current issues facing community colleges, including marginalization of students and institutions, and transfer and articulation policy.  
**Term Offered:** Spring, Summer, Fall  
HED 6250 Technical Higher Education  
[3 credit hours (3, 0, 0)]  
This course examines the development, mission, functions, and assessment of technical, occupational, and career education, including community needs assessment.  
**Term Offered:** Spring, Summer, Fall  
HED 6270 Learning and Teaching in Higher Education  
[3 credit hours (3, 0, 0)]  
Course facilitates application of theory to practice of teaching in higher education. Students explore diverse pedagogical approaches, professional faculty roles effective learning and teaching.  
**Term Offered:** Fall  
HED 6410 College & University Curriculum  
[3 credit hours (3, 0, 0)]  
The course examines the philosophical and conceptual underpinnings of college and university curriculum. It introduces a model for curriculum planning, implementation, and evaluation in American higher education, and a framework for designing and assessing courses and curricula.  
**Term Offered:** Fall  
HED 6440 General Education In Higher Education  
[3 credit hours (3, 0, 0)]  
This course will examine the meaning and purposes of general education in the United States. Students will become acquainted with the design, analysis and evaluation of general education curricula.  
**Term Offered:** Fall  
HED 6510 The American College Student  
[3 credit hours (3, 0, 0)]  
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 6520 Organization & Management Of Student Affairs  
[3 credit hours (3, 0, 0)]  
This course provides an overview of functional areas of student affairs and the philosophies and ethics that guide the profession. The overview also considers general areas that influence student affairs such as university mission, campus culture and environment, leadership, financing and budgeting, university assessment, student demographics and diversity, and student development.  
**Term Offered:** Spring, Summer, Fall  
HED 6530 Theories Of Student Development  
[3 credit hours (3, 0, 0)]  
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, Fall  
HED 6540 HED 6540 Advising Diverse Students  
[3 credit hours (3, 0, 0)]  
This seminar considers the advising role of higher education professionals, emphasizing the ways that culture, race, ethnicity, gender, religion, sexual orientation, socio economic status, and other diversities may impact work with students.  
**Term Offered:** Spring, Fall  
HED 6570 Research in Higher Education  
[3 credit hours (3, 0, 0)]  
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 6610 Issues Of Access In Higher Education  
[3 credit hours (3, 0, 0)]  
This course explores access issues that result from the changing educational needs of society and analyzes the application of democratic ideals of American education to current educational policies affecting access.  
**Term Offered:** Fall  
HED 6630 Faculty Issues in Higher Education  
[3 credit hours (3, 0, 0)]  
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:** Fall  
HED 6640 Governance And Administration In Higher Education  
[3 credit hours (3, 0, 0)]  
This 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 6650 Community College Leadership  
[3 credit hours (3, 0, 0)]  
This course examines community college leadership and administration. It introduces models for leading change and explores challenges facing community college leaders.  
**Term Offered:** Summer, Fall  
HED 6660 Building Academic Culture  
[3 credit hours (3, 0, 0)]  
An examination of institutional culture and the interplay of student, faculty and administrative subcultures. Critical perspectives are used to analyze and understand cultural inquiry, conflict and collaboration in post secondary institutions.  
**Term Offered:** Spring, Fall  
HED 6700 Finance Of Higher Education  
[3 credit hours (3, 0, 0)]  
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, Fall
HED 6710 Economics Of Higher Education
[3 credit hours (0, 0, 3)]
This course discusses issues related to the revenue sources of higher education and discussion of the social worth of public and private sector investment in higher education. Issues include the connection of educational outcomes to educational budget making and how sources of funds drive educational policymaking.

HED 6730 Legal Aspects Of Higher Education
[3 credit hours (3, 0, 0)]
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

HED 6750 Strategic Planning And Decision Making
[3 credit hours (0, 0, 3)]
This course provides an overview and applications of strategic planning theories and methods in higher education and explores how external environments and internal dynamics affect planning processes. The development and implementation of strategic plans are covered as well as the leadership skills needed to direct strategic decision-making.

HED 6770 Evaluation And Outcomes Assessment In Higher Education
[3 credit hours (3, 0, 0)]
This course focuses on outcomes-based assessment of learning and development in student affairs.
Term Offered: Spring, Summer, Fall

HED 6790 Managing College And University Personnel
[3 credit hours (0, 0, 3)]
This course acquaints students with key concepts related to the effective management of human resources within institutions of higher education. Topics covered may include human resource management, diversity and inclusion, talent management, training and development, employee engagement and retention, performance management, benefits and compensation, ethics and fair treatment, and collective bargaining in higher education.
Term Offered: Fall

HED 6810 Women In Higher Education
[3 credit hours (3, 0, 0)]
This course introduces students to the historical, social, and cultural influences on women's higher education, and explores the campus climate for women as students, administrators, faculty, and governing board members. Special attention is paid to the intersections of gender with race and class.
Term Offered: Spring, Fall

HED 6820 Institutional Advancement In Higher Education
[3 credit hours (3, 0, 0)]
Overview of the field of development and introduction to the knowledge, research and theory emerging in the field. Focus on practical skill enhancement as it applies to building development programs.

HED 6830 The Independent College
[3 credit hours (3, 0, 0)]
The course examines the historical and conceptual underpinnings of the independent college and university. It explores the strengths, weaknesses, opportunities, and challenges of small residential liberal arts colleges, along with the other major categories of private colleges and universities in the American context.
Term Offered: Summer

HED 6840 Adult Continuing Education
[3 credit hours (3, 0, 0)]
Course assists student in interpreting the highly diversified field of adult continuing education from the point of view of the student's current or anticipated involvement. Intended for teachers of adults.

HED 6850 Critical Issues In Higher Education
[3 credit hours (3, 0, 0)]
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 6870 Economic Development And Higher Education
[3 credit hours (3, 0, 0)]
How do institutions of higher education impact their local economies? This course examines various roles and methods by which institutions of higher education add to economic development.

HED 6910 Introduction to Interpretive Inquiry
[3 credit hours (0, 0, 3)]
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.

HED 6920 Master's Project In Higher Education
[1-3 credit hours (0, 0, 0-1)]
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

HED 6940 Master's Practicum In Higher Education
[1-3 credit hours (0, 0, 0-1)]
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 100 hours of work under the supervision of an experienced administrator. Seminar coursework accompanies the practicum experience.
Term Offered: Spring, Summer, Fall

HED 6950 HED 6950: Master's Internship in Higher Education
[1-4 credit hours (0, 0, 1-4)]
The Master's Internship in Higher Education links directly to a student's Graduate Assistantship and offers students the opportunity to integrate theory, research, and skills gained through courses, workshops, and seminars with the knowledge, skills, and abilities they are developing through practice. In addition, the Internship serves as structured professional development opportunity for enhancing theory-to-practice knowledge and skills of the students and practitioners involved. The HED Internship has been developed jointly by the HED Program and UT's Student Affairs, and includes the collaborative participation of both student affairs professionals and higher education faculty.

HED 6960 Master's Thesis In Higher Education
[1-3 credit hours (0, 0, 0-1)]
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
[1-3 credit hours (0, 0, 1-3)]
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, Summer, Fall

HED 6990 Independent Study In Higher Education-Masters
[1-3 credit hours (0, 0, 0-1)]
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
[3 credit hours (3, 0, 0)]
Review and application of diversity work as it relates to leadership frameworks and media impacts. Topics include but are not limited to diversity team leadership types, diversity examined through interpersonal and mass communication lenses, and understanding the components of being an effective Chief Diversity Officer.
Term Offered: Fall

HED 7910 Diversity Beginnings
[3 credit hours (0, 0, 3)]
Review and application of diversity-related theory, social and psychological understanding, and interpersonal communication when applying to diversity experiences.

HED 7930 Interdisciplinary Seminar
[3 credit hours (3, 0, 0)]
This seminar formatted course will provide the opportunity to explore problems and issues from the perspectives of the various fields of education and of other disciplines related to higher education.

HED 7950 Workshop In Higher Education
[1-3 credit hours (0, 0, 0-3)]
Each workshop is developed on a topic of interest to faculty members and administrators of higher education institutions. Practical applications of the workshop topic will be emphasized.

HED 7960 Diversity in Practice
[3 credit hours (0, 0, 3)]
Review the different dimensions of diversity, understanding of laws that are in diversity-related areas, and exploration of diversity in a health care setting.

HED 7970 Diversity Advancement
[3 credit hours (0, 0, 3)]
Review and application of diversity work as it related to measurement and diversity analysis. Topic categories include but not limited to measuring diversity, creating climate surveys, developing diversity plans, and understanding the components of being an effective Chief Diversity Officer.

HED 7980 Special Topics In Higher Education
[1-3 credit hours (0-3, 0, 0)]
This seminar provides advanced study in special topics of interest to faculty and administrators in higher education.
Term Offered: Summer, Fall

HED 8010 History Of Higher Education
[3 credit hours (3, 0, 0)]
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: Spring, Fall

HED 8020 Advanced Seminar In Historiography Hied
[3 credit hours (3, 0, 0)]
Historical methods applied to research in higher education discussed. Course focuses on in-depth readings of primary source material on liberal arts colleges, universities and community colleges. Research paper required.

HED 8030 Federal And State Policy Analysis
[3 credit hours (3, 0, 0)]
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 (0, 3, 0)]
Complex interrelationships between global issues and educational 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 8210 The Community College
[3 credit hours (3, 0, 0)]
A study of the history, distinguishing characteristics (mission, functions, organization, curriculum, finances), and current issues facing community colleges, including marginalization of students and institutions, and transfer and articulation policy.
Term Offered: Spring, Fall

HED 8250 Technical Higher Education
[3 credit hours (3, 0, 0)]
This course examines the development, mission, functions, and assessment of technical, occupational, and career education, including community needs assessment.

HED 8270 Learning and Teaching in Higher Education
[3 credit hours (3, 0, 0)]
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 8410 College & University Curriculum
[3 credit hours (3, 0, 0)]
The course examines the philosophical and conceptual underpinnings of college and university curriculum. It introduces a model for curriculum planning, implementation, and evaluation in American higher education, and a framework for designing and assessing courses and curricula.

HED 8440 General Education In Higher Education
[3 credit hours (3, 0, 0)]
This course will examine the meaning and purposes of general education in the United States. Students will become acquainted with the design, analysis and evaluation of general education curricula.
HED 8510 The American College Student
[3 credit hours (3, 0, 0)]
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: Summer

HED 8520 Org & Mgmt Of Student Affairs
[3 credit hours (3, 0, 0)]
This course provides an overview of functional areas of student affairs and the philosophies and ethics that guide the profession. The overview also considers general areas that influence student affairs such as university mission, campus culture and environment, leadership, financing and budgeting, university assessment, student demographics and diversity, and student development.

Term Offered: Fall

HED 8530 Theories Of Student Development
[3 credit hours (3, 0, 0)]
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 8570 Research In Higher Education
[3 credit hours (0, 0, 3)]
*This course introduces students to various research approaches in the field of higher education. Students learn how to critique research articles in the field of higher education, how higher education institutions are classified, what national postsecondary datasets are available for their own research, and how to develop and present a research study proposal.

Term Offered: Spring, Fall

HED 8580 Leadership Theory
[3 credit hours (0, 0, 3)]
This seminar examines the theory and practice of leadership in higher education. Topics may include the leadership experience, leadership in engaging higher education in social change, and the roles of academic leaders.

HED 8610 Issues Of Access In Higher Education
[3 credit hours (3, 0, 0)]
This course explores access issues that result from the changing educational needs of society and analyzes the application of democratic ideals of American education to current educational policies affecting access.

HED 8630 Faculty Issues In Higher Education
[3 credit hours (3, 0, 0)]
This course explores current issues in the American academic profession. Topics may include faculty work, faculty reward systems, diversity issues, gender issues, salary issues, part-time faculty, work-home balance, governance, satisfaction, career choice, recruitment and retention, and faculty career stages.

HED 8640 Governance And Administration In Higher Education
[3 credit hours (3, 0, 0)]
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

HED 8650 Community College Leadership
[3 credit hours (0, 0, 3)]
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 8660 Building Academic Culture
[3 credit hours (3, 0, 0)]
An examination of institutional culture and the interplay of student, faculty and administrative subcultures. Critical perspectives are used to analyze and understand cultural inquiry, conflict and collaboration in post secondary institutions.

HED 8700 Finance Of Higher Education
[3 credit hours (3, 0, 0)]
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, Fall

HED 8710 Economics Of Higher Education
[3 credit hours (0, 0, 3)]
This course discusses issues related to the revenue sources of higher education and discussion of the social worth of public and private sector investment in higher education. Issues include the connection of educational outcomes to educational budget making and how sources of funds drive educational policymaking.

HED 8730 Legal Aspects Of Higher Education
[3 credit hours (3, 0, 0)]
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 8750 Strategic Planning And Decision Making
[3 credit hours (0, 0, 3)]
This course provides an overview and applications of strategic planning theories and methods in higher education and explores how external environments and internal dynamics affect planning processes. The development and implementation of strategic plans are covered as well as the leadership skills needed to direct strategic decision-making.

HED 8770 Evaluation And Outcomes Assessment In Higher Education
[3 credit hours (3, 0, 0)]
This course focuses on outcomes-based assessment of learning and development in student affairs.

Term Offered: Spring, Fall

HED 8790 Managing College And University Personnel
[3 credit hours (0, 0, 3)]
This course acquaints students with key concepts related to the effective management of human resources within institutions of higher education. Topics covered may include human resource management, diversity and inclusion, talent management, training and development, employee engagement and retention, performance management, benefits and compensation, ethics and fair treatment, and collective bargaining in higher education.

Term Offered: Spring, Fall
HED 8810 Women In Higher Education  
[3 credit hours (3, 0, 0)]  
This course introduces students to the historical, social, and cultural influences on women's higher education, and explores the campus climate for women as students, administrators, faculty, and governing board members. Special attention is paid to the intersections of gender with race and class.  
Term Offered: Spring

HED 8820 Institutional Advancement In Higher Education  
[3 credit hours (3, 0, 0)]  
Overview of the field of development and introduction to the knowledge, research, and theory emerging in the field. Focus on practical skill enhancement as it applies to building development programs.

HED 8830 The Independent College  
[3 credit hours (3, 0, 0)]  
The course examines the historical and conceptual underpinnings of the independent college and university. It explores the strengths, weaknesses, opportunities, and challenges of small residential liberal arts colleges, along with the other major categories of private colleges and universities in the American context.  
Term Offered: Summer

HED 8840 Adult Continuing Education  
[3 credit hours (3, 0, 0)]  
Course assists student in interpreting the highly diversified field of adult continuing education from the point of view of the student's current or anticipated involvement. Intended for teachers of adults.

HED 8850 Critical Issues In Higher Education  
[3 credit hours (3, 0, 0)]  
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 8870 Economic Development And Higher Education  
[3 credit hours (3, 0, 0)]  
How do institutions of higher education impact their local economies? This course examines various roles and methods by which institutions of higher education add to economic development.

HED 8910 Introduction to Interpretive Inquiry  
[3 credit hours (0, 0, 3)]  
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 (0, 0, 3)]  
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 (0, 0, 3)]  
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 (0, 0, 0-1)]  
The internship provides students an opportunity to accumulate 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 8950 Doctoral Dissertation  
[1-12 credit hours (0, 0, 0-1)]  
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 8960 Dissertation  
[1-3 credit hours (0, 0, 0-1)]  
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

SPED 5000 Issues In Special Education  
[3 credit hours (3, 0, 0)]  
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 (2.5, 0, 0)]  
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

SPED 5080 Curriculum Adaptations and Strategies in Early Childhood Education  
[3 credit hours (3, 0, 0)]  
[3 hours] Early childhood development, including learning and behavioral characteristics examined focusing on implications of developmental delay and risk. Implications for IEP-based instruction explored. Strategies that support inclusion discussed. Prerequisite: CIEC 5000, EDP 5210, SPED 5010.  
Term Offered: Spring, Fall
SPED 5120 Students With Special Needs: Developmental And Educational Implication
[3 credit hours (3, 0, 0)]
In-depth study of personality, psychological and physical development, and educational needs of atypical children: including current research issues in areas of social, legal and environmental aspects of exceptional populations.

SPED 5150 Advanced Practicum For Teaching Students With Moderate Educational Needs
[1 credit hour (0, 0, 2.7)]
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, Fall

SPED 5160 Advanced Instructional Methods For Teaching Students With Moderate Educational Needs
[3 credit hours (3, 0, 0)]
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, and social skills.

SPED 5170 Supporting Youth And Adults With Disabilities Living And Working In The Community
[3 credit hours (3, 0, 0)]
In-depth study of issues faced by adults with severe and multiple disabilities and their families. Emphasis on supported employment, residential options, self-determination, recreation and quality of life issues. Field experience required.
Term Offered: Fall

SPED 5180 Advanced Instructional Methods For Teaching Students With Intensive Educational Needs
[3 credit hours (3, 0, 0)]
An in-depth examination of appropriate curriculum models, instructional strategies and adaptations, and related behavior problems for students with severe and multiple disabilities. A transdisciplinary team approach is explored.
Term Offered: Spring

SPED 5190 Advanced Practicum For Students With Intensive Needs
[1 credit hour (0, 0, 1)]
This course is taken with SPED 5180 to apply strategies and techniques for teaching students with intensive needs. Forty field hours are required.
Term Offered: Spring

SPED 5210 Augmentative and Alternative Communication
[3 credit hours (3, 0, 0)]
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.

SPED 5220 Research And Practice In Teaching Phonics, Reading And Writing To Students With Special Needs
[3 credit hours (3, 0, 0)]
Current trends and issues in teaching reading and writing to students with disabilities. Examination of research supporting various methods. Application of research-based methods into practical strategies for classroom implementation. Twenty-four hours of field required.
Term Offered: Summer, Fall

SPED 5230 Advanced Field Practicum In Diagnostic And Prescriptive Teaching
[1 credit hour (0, 0, 2.5)]
Provides the laboratory to rehearse and refine the teaching skills presented in SPED 5/7220. Required of persons seeking initial special education certification. Forty field hours required. Taken concurrently with SPED 5220.

SPED 5240 Disorders and Characteristics of Students with Emotional Disturbance
[3 credit hours (0, 0, 3)]
This course introduces conceptual models of emotional disturbance (ED) in children and adolescents. Definitive diagnostics categories and their etiology are presented in contexts of their use in a variety of educational settings appropriate for children and adolescents with ED.
Prerequisites: SPED 5000

SPED 5250 Career And Vocational Education For Students With Disabilities
[3 credit hours (3, 0, 0)]
This course covers career and vocational education activities for youths with disabilities. Special emphasis placed on developing and implementing an Individual Transition Plan (ITP) and coordination with adult service providers.
Term Offered: Spring, Summer

SPED 5260 Family And Professional Relations In Special Education
[3 credit hours (3, 0, 0)]
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 (2.5, 0, 0)]
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 (2.5, 0, 0)]
Aspects of quality environments, in the home and in early childhood centers for young children with special needs. Of particular interest is identifying characteristics of natural environments that promote positive child outcomes.
Term Offered: Spring
SPED 5300 Teaching Literacy Skills To Adolescents With Disabilities
[3 credit hours (2.5, 0, 0)]
This course will review existing theories and research regarding teaching literacy to students with disabilities in 4th through 12th grades (those who did not learn to read by 3rd grade).
Term Offered: Summer

SPED 5310 Advanced Instructional Methods For Teaching Students With Mild Educational Needs
[3 credit hours (0, 0, 3)]
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 Advanced Field Practicum For Students With Mild Educational Needs
[1 credit hour (0, 0, 2.5)]
Provides opportunities for field experience to use and refine the strategies for persons with mild disabilities presented in SPED 5310. Forty hours of field required.
Term Offered: Spring, Fall

SPED 5330 Advanced Child Study Institute: Ebd
[1 credit hour (0, 0, 2)]
Provides quality educational settings to inservice teachers to practice effective behavioral and academic managing of children and youth experiencing continuous emotional stress and trauma.

SPED 5340 Advanced Behavior Management
[3 credit hours (3, 0, 0)]
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 5450 Advanced Methods of Teaching Studeents With Emotional Disturbance
[3 credit hours (0, 0, 3)]
This course provides evaluation and application techniques of research-based methodologies for teaching students with emotional disturbance in school-based settings within the least restrictive environment.
Prerequisites: SPED 5340
Term Offered: Fall

SPED 5510 Curriculum And Teaching Strategies: Physical And Other Health Impairments
[3 credit hours (3, 0, 0)]
Appropriate curriculum models, learning objectives and teaching strategies for students with physical or health impairing conditions are examined. Modification of materials, assessment options and alternatives response modes will be discussed.

SPED 5600 ADVANCED PROFESSIONAL REFLECTIVE SEMINAR
[3 credit hours (0, 0, 3)]
The focus of this seminar is on teaching as a profession. Student will complete The Student Teaching Portfolio Project, a performance-based assessment approach to licensure and professional development. Additionally, this internship seminar provides a forum for group sharing, reflection, professional issues, ethical behaviors, interview processes, and career development.
Corequisites: SPED 6940
Term Offered: Spring, Fall

SPED 5610 Seminar I: Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
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 5270
Term Offered: Summer

SPED 5620 Seminar II: Working Effectively with Team Members
[1 credit hour (0, 0, 1)]
Factors that support and threaten interprofessional collaboration. Become aware of policies affecting teaming. Engage in advocacy for teaming that will benefit individuals with disabilities.
Prerequisites: SPED 5610 and SPED 5270
Term Offered: Summer, Fall

SPED 5630 Seminar III: Evidence-Based Practice and Innovation in Teaming
[1 credit hour (0, 0, 1)]
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 5620
Corequisites: SPED 5640
Term Offered: Summer

SPED 5640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
Students will work as part of an inter-professional team to develop, implement, and evaluate integrated intervention plans designed to support the development of children who have special needs.
Prerequisites: SPED 5620
Corequisites: SPED 5630
Term Offered: Spring, Summer

SPED 5950 Workshop In Special Education
[1-5 credit hours (0, 0, 0-5)]
A workshop developed around topics of interest and concern for in-service teachers and other education personnel. Practical application of workshop topics will be emphasized.
Term Offered: Summer

SPED 5980 Special Topics In Special Education
[1-5 credit hours (0, 0, 0-5)]
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 (0, 0, 0-5)]
Individual study provides graduate students with 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 6060 K-3 Curr. Models and Int. Strategies
[3 credit hours (0, 0, 3)]
Examination of appropriate curriculum models, instructional strategies and adaptations for young students (K-3 grade) with mild to intensive educational needs. A trans-disciplinary team approach is explored with an emphasis on collaboration and communication.
Term Offered: Spring

SPED 6070 Curriculum Models And Intervention Strategies In Early Childhood Special Education
[3 credit hours (0, 0, 3)]
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. 20 clock hour practicum required.
Term Offered: Fall

SPED 6080 Clinical And Educational Evaluation Of Students With Disabilities
[3 credit hours (3, 0, 0)]
An in-depth study of instruments used by school psychologists and classroom teachers to access and evaluate students. The diagnostic uses and the understanding of the results will be the focus.

SPED 6220 Collaboration For Inclusive Schools
[3 credit hours (0, 0, 3)]
Provides information and competencies to develop, implement and evaluate collaborative programs. Educators will enhance their ability to collaborate so that they can better meet the needs of their students.

SPED 6250 Issues And Research In Transitin And Post-Secondary Outcomes For Student With Disabilities
[3 credit hours (2, 5, 0, 0)]
In-depth study of transition issues and outcomes focusing on: a) best practices, b) the roles and responsibilities of a transition specialist, c) inter-agency collaboration, d) team building, and e) program development, implementation and evaluation.
Term Offered: Spring

SPED 6350 Educational And Instructional Implications In Specific Learning Disabilities
[3 credit hours (3, 0, 0)]
Students will examine current trends in research and program development in Specific Learning Disabilities. The focus will be on learning and study skills: their implication in the development of learning.

SPED 6360 Clinical Practicum: Learning Strategies For Students With Specific Learning Disabilities
[1 credit hour (0, 0, 1.5)]
Provides advanced graduate student with supervised practice in developing and implementing strategies and study skills for persons with learning problems. Required 15 hours instructional practice and weekly meetings with supervisors.

SPED 6410 Theory And Research: Emotional Behavioral Disorders
[3 credit hours (0, 0, 3)]
This course provides in-depth readings on problems of emotionally and behaviorally disturbed/disordered children and youth. Intense study on two levels: (1) theoretical considerations and (2) treatments pertinent to diverse educational settings.
Term Offered: Fall

SPED 6420 Public School Emotional Behavior Disorders
[1 credit hour (0, 0, 2)]
This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. Public School settings include: self-contained, resource, transition, mainstreamed and consultative-collaborative teaching roles.
Term Offered: Spring, Summer

SPED 6440 Teaching Children And Youth With Emotional Behavior Disorders
[3 credit hours (3, 0, 0)]
This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral Disorders/disturbances. Psycho-social educational best practices within the least restrictive environment are presented.
Term Offered: Spring

SPED 6470 Theory And Research: Autism
[3 credit hours (3, 0, 0)]
This course provides in-depth readings in the field of autism. The course includes intense study on two levels: (1) theoretical considerations and (2) treatment approaches pertinent to populations with autism.

SPED 6480 Teach Youth/Child With Autism
[3 credit hours (3, 0, 0)]
This course provides research based methodologies for understanding and teaching children and youth with autism. Psycho-Social Educational best practices within the least restrictive environment are presented.

SPED 6920 Master's Research Project In Special Education
[1-5 credit hours (0, 0, 0)]
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 6930 Seminars In Special Education
[1-5 credit hours (0, 0, 0)]
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 (0, 0, 0-16)]
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 6960 Master Research Thesis In Special Education**
[1-5 credit hours (0, 0, 0-5)]
The master's thesis is an individually designed research study which meets the final activity requirement for completion of the master's degree.
**Term Offered:** Spring, Summer, Fall

**SPED 6990 Independent Study In Special Education**
[1-5 credit hours (0, 0, 0-5)]
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

**SPED 7000 Issues In Special Education**
[3 credit hours (3, 0, 0)]
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 7120 Students With Special Needs: Developmental And Educational Implication**
[3 credit hours (3, 0, 0)]
In-depth study of personality, psychological and physical development, and educational needs of atypical children: including current research issues in areas of social, legal and environmental aspects of exceptional populations.

**SPED 7150 Advanced Practicum For Teaching Students With Moderate Educational Needs**
[1 credit hour (0, 0, 2.5)]
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 7170 Supporting Youths And Adults With Disabilities Living And Working In The Community**
[3 credit hours (3, 0, 0)]
In-depth study of issues faced by adults with severe and multiple disabilities and their families. Emphasis on supported employment, residential options, self-determination, recreation and quality of life issues. Field experience required.
**Term Offered:** Fall

**SPED 7180 Advanced Instructional Methods For Teaching Students With Intensive Educational Needs**
[3 credit hours (3, 0, 0)]
An in-depth examination of appropriate curriculum models, instructional strategies and adaptations, and related behavior problems for students with severe and multiple disabilities. A transdisciplinary team approach is explored.
**Term Offered:** Spring

**SPED 7190 Advanced Practicum For Students With Intensive Needs**
[1 credit hour (0, 0, 1)]
This course is taken with SPED 7180 to apply strategies and techniques for teaching students with intensive needs. Forty field hours are required.
**Term Offered:** Spring

**SPED 7210 Augmentative and Alternative Communication**
[3 credit hours (3, 0, 0)]
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.

**SPED 7220 Research And Practice In Teaching Phonics, Reading And Writing To Students With Special Needs**
[3 credit hours (3, 0, 0)]
Current trends and issues in teaching reading and writing to students with disabilities. Examination of research supporting various methods. Application of research-based methods into practical strategies for classroom implementation. Twenty-four hours of field required.
**Term Offered:** Summer, Fall

**SPED 7230 Advanced Field Practicum In Diagnostic And Prescriptive Teaching**
[1 credit hour (0, 0, 2.5)]
Provides the laboratory to rehearse and refine the teaching skills presented in SPED 5/7220. Required of persons seeking initial special education certification. Forty field hours required. Taken concurrently with SPED 7220.

**SPED 7250 Career And Vocational Education For Students With Disabilities**
[3 credit hours (3, 0, 0)]
This course covers career and vocational education activities for youths with disabilities. Special emphasis placed on developing and implementing an Individual Transition Plan (ITP) and coordination with adult service providers.
**Term Offered:** Spring, Summer
SPED 7260 Family And Professional Relations In Special Education
[3 credit hours (3, 0, 0)]
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 (2.5, 0, 0)]
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 (2.5, 0, 0)]
Aspects of quality environments, in the home and in early childhood centers for young children with special needs. Of particular interest is identifying characteristics of natural environments that promote positive child outcomes.
Term Offered: Spring, Fall

SPED 7310 Advanced Instructional Methods For Teaching Students With Mild Educational Needs
[3 credit hours (3, 0, 0)]
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 Advanced Field Practicum For Students With Mild Educational Needs
[1 credit hour (0, 0, 2.5)]
Provides opportunities for field experience to use and refine the strategies for persons with mild disabilities presented in SPED 7310. Forty hours of field required.
Term Offered: Fall

SPED 7330 Advanced Child Study Institute: Ebd
[1 credit hour (0, 0, 2.5)]
Provides quality educational settings to inservice teachers to practice effective behavioral and academic managing of children and youth experiencing continuous emotional stress and trauma.

SPED 7340 Advanced Behavior Management
[3 credit hours (3, 0, 0)]
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 7510 Curriculum And Teaching Strategies: Physical And Other Health Impairments
[3 credit hours (3, 0, 0)]
Appropriate curriculum models, learning objectives and teaching strategies for students with physical or health impairing conditions are examined. Modification of materials, assessment options and alternatives response modes will be discussed.

SPED 7610 Seminar I: Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
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
Term Offered: Summer

SPED 7620 Seminar II: Working Effectively with Team Members
[1 credit hour (0, 0, 1)]
Factors that support and threaten interprofessional collaboration. Become aware of policies affecting teaming. Engage in advocacy for teaming that will benefit individuals with disabilities.
Prerequisites: SPED 7610 and SPED 7270

SPED 7630 Seminar III: Evidence-Based Practice and Innovation in Teaming
[1 credit hour (0, 0, 1)]
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
Corequisites: SPED 7640
Term Offered: Summer

SPED 7640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
Students will work as part of an inter-professional team to develop, implement, and evaluate integrated intervention plans designed to support the development of children who have special needs.
Prerequisites: SPED 7620
Corequisites: SPED 7630
Term Offered: Summer

SPED 7800 Practical And Theoretical Implication Of Vision Impairment
[3 credit hours (0, 0, 3)]
A study of the research on the anatomy and physiology of the eye, visual impairments and the practical implication for learning, working and independent living.

SPED 7810 Low Vision: Theory & Research
[3 credit hours (0, 0, 3)]
An in-depth study of the field of low vision. Conditions, equipment and instruction will be reviewed and analyzed for their implication to the field of vision.

SPED 7880 Advanced Study Of Technology And Independent Daily Living For The Persons With Visual Impairment
[3 credit hours (0, 0, 3)]
This course includes the research regarding technology, strategies and an analytical evaluation of the independent living of the blind and visually impaired.
SPED 7950 Workshop In Special Education
[1-5 credit hours (0, 0, 0-5)]
A workshop developed around topics of interest and concern for in-service teachers and other education personnel. Practical application of workshop topics will be emphasized.
Term Offered: Summer

SPED 7980 Special Topics In Special Education
[1-5 credit hours (0, 0, 0-5)]
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 (0, 0, 0-5)]
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: Summer, Fall

SPED 8060 K-3 Curr Models and Int Strate
[3 credit hours (0, 0, 3)]
Examination of appropriate curriculum models, instructional strategies and adaptions for young students (K-3 grade) with mild to intensive educational needs. A trans-disciplinary team approach is explored with an emphasis on collaboration and communication.
Term Offered: Spring

SPED 8070 Curriculum Models And Intervention Strategies In Early Childhood Special Education
[3 credit hours (3, 0, 0)]
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. 20 clock hour practicum required.
Term Offered: Spring, Summer, Fall

SPED 8080 Clinical And Educational Evaluation Of Students With Disabilities
[3 credit hours (0, 0, 3)]
An in-depth study of instruments used by school psychologists and classroom teachers to access and evaluate students. The diagnostic uses and the understanding of the results will be the focus.

SPED 8220 Collaboration For Inclusive Schools
[3 credit hours (0, 0, 3)]
Provides information and competencies to develop, implement and evaluate collaborative programs. Educators will enhance their ability to collaborate so that they can better meet the needs of their students.

SPED 8250 Issues And Research In Transition And Post-Secondary Outcomes For Students With Disabilities
[3 credit hours (2.5, 0, 0)]
In-depth study of transition issues and outcomes focusing on: a) best practices, b) the roles and responsibilities of a transition specialist, c) inter-agency collaboration, d) team building, and e) program development, implementation and evaluation.
Term Offered: Spring

SPED 8350 Educational And Instructional Implications In Specific Learning Disabilities
[3 credit hours (3, 0, 0)]
Students will examine current trends in research and program development in Specific Learning Disabilities. The focus will be on learning and study skills: their implication in the development of learning.

SPED 8360 Clinical Practicum: Learning Strategies For Students With Specific Learning Disabilities
[1 credit hour (0, 0, 1.5)]
Provides advanced graduate student with supervised practice in developing and implementing strategies and study skills for persons with learning problems. Required 15 hours instructional practice and weekly meetings with supervisors.

SPED 8410 Theory And Research: Emotional Behavioral Disorders
[3 credit hours (0, 0, 3)]
This course provides in-depth readings on problems of emotionally and behaviorally disturbed/disordered children and youth. Intense study on two levels: (1) theoretical considerations and (2) treatments pertinent to diverse educational settings.

SPED 8420 Public School Emotional Behavior Disorders
[1 credit hour (0, 0, 2.5)]
This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. Public School settings include: self-contained, resource, transition, mainstreamed and consultative-collaborative teaching roles.

SPED 8440 Teaching Children And Youth With Emotional Behavior Disorders
[3 credit hours (3, 0, 0)]
This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral Disorders/disturbances. Psycho-social educational best practices within the least restrictive environment are presented.
Term Offered: Spring

SPED 8470 Theory And Research: Autism
[3 credit hours (3, 0, 0)]
This course provides in-depth readings in the field of autism. The course includes intense study on two levels: (1) theoretical considerations and (2) treatment approaches pertinent to populations with autism.

SPED 8480 Teach Youth/Child With Autism
[3 credit hours (3, 0, 0)]
This course provides research based methodologies for understanding and teaching children and youth with autism. Psycho-Social Educational best practices within the least restrictive environment are presented.

SPED 8720 Advanced Language And Speech For Persons With Hearing Impairments
[3 credit hours (3, 0, 0)]
Clinical evaluation model in descriptive linguistics and interaction in the use of a process approach to developing language with children with hearing impairments. Includes relation of hearing impairment to language development.
Diversity Certificate

The Office of Equity, Diversity and Community Engagement with the Higher Education Program offer an online, 12-credit hour Certificate Program in Diversity taken over three semesters.

Current UT Graduate Students

- Complete an “Adding a Certificate” form available at http://www.utoledo.edu/graduate/files/Request_to_add_a_grad_certific.pdf
- One letter of recommendation from a faculty member of your current graduate program
- A statement of purpose which, minimally, answers the following:
  - What are your career aspirations?
  - How will this certificate help you achieve your career goals?
  - What training, if any, do you have in diversity?

Not a Current Student

- Apply to the UT College of Graduate Studies online at http://apply.utoledo.edu
- A Bachelor’s degree with a minimum undergraduate GPA of 2.7
- Official transcripts from all previous coursework
- One letter of recommendation from either an employer or a faculty member
- A statement of purpose as described in third bullet under “current UT graduate students”

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
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<tr>
<td>HED 5900/7900</td>
<td>Diversity Leadership (fall semester)</td>
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<tr>
<td>HED 5910/7910</td>
<td>Diversity Beginnings (fall semester)</td>
<td>3</td>
</tr>
<tr>
<td>HED 5960/7960</td>
<td>Diversity in Practice (spring semester)</td>
<td>3</td>
</tr>
<tr>
<td>HED 5970/7970</td>
<td>Diversity Advancement (spring semester)</td>
<td>3</td>
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<tr>
<td>Total Hours</td>
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<td>12</td>
</tr>
</tbody>
</table>

EdS in Special Education

Educational specialist (Ed.S.) degree is available through a post-master’s graduate program that provides students an area of educational specialization with emphasis on practice. Specific areas represented in the Department of Early Childhood, Higher Education, & Special Education are special education and early childhood education.

The Ed.S. in curriculum and instruction is designed to meet the needs of individuals involved with the curriculum, teaching, and supervision aspects of discipline-centered areas of study. The degree provides patterns of study for teachers and supervisors who want an education beyond the master’s degree as a specialist, but who are not interested in a doctoral degree. For the program and requirements of a specific area, contact a faculty advisor.

Admission requirements to the Ed.S. programs include a bachelor’s degree from an accredited four-year institution and a master’s degree from an accredited institution.

- The three (3) letters of recommendation are expected from academic professionals to support the applicant's ability and character to succeed in the graduate degree.
- A statement of purpose is required to demonstrate writing ability and to describe the applicant's goals and how the educational specialist degree supports those goals.
- Students must complete a minimum of 30 semester hours of approved graduate coursework beyond the master's level with a minimum GPA of 3.0 on a 4.0 scale.
- Students are required to develop a plan of study with their advisor that specifies the coursework that must be completed to fulfill degree requirements. This plan must be filed prior to the completion of 15
semesters hours and must be approved by the advisor, the department chairperson, and the college associate dean.

- All course work for the Ed.S. must be taken within a six-year period immediately preceding the date the degree is awarded.
- Programs require the completion of a culminating experience, which may include field experiences, internships, or other professional projects (e.g., CI 7940, CIEC 7940).
- No more than a total of six semester hours of credit from any combination of workshops (7950), problems or special topics courses (7980) or independent studies (7990 or 8990) may be applied to a specialist’s program.

**Graduate Certificate in Interprofessional Teaming in Early Childhood**

The goal of the Graduate Certificate in Interprofessional Teaming is to prepare and guide professionals to engage in collaborative best practices in service to individuals with special needs and their families. The Graduate Certificate in Interprofessional Teaming advances this mission. Graduate students already enrolled in professional programs in the following six disciplines will be able to earn this certificate to augment their preparation to engage in collaborative best practices in services to young children with special needs and their families:

- Early Childhood Education,
- Occupational Therapy,
- Physical Therapy,
- School Psychology,
- Special Education,
- Speech Language Pathology

The criteria for eligibility for enrollment and retention in the certificate program include:

- Completion of the first semester in one’s program of study with a minimum 3.5 GPA and otherwise in good standing, as verified by program director and/or academic advisor,
- Submission of a statement of purpose outlining one’s desire to complete the certificate, and
- Grades of B or higher in all certificate courses.

Students will demonstrate competencies through individualized programs of study, approved by faculty members affiliated with the certificate program. Students should consult their advisor for detailed information.

While earning the certificate will entail documenting 38 competencies (in the areas of Collaboration, Advocacy, Diversity and Cultural Competence, Evidence-Based Practice, Professional and Ethical Standards, Technology, Human Development, Assessment and Evaluation, and Service Provision), the minimum total credit hours to be awarded the certificate is 12. In addition to the core courses required by the certificate, additional courses from the student’s professional program will be identified by the advisor. The certificate must be awarded simultaneously with the professional degree.

**Master of Education in Early Childhood Education PreK-3**

**Admission to Master’s Degree Programs in Early Childhood and Special Education**

In addition to the College of Graduate Studies admission requirements, early childhood and special education master’s programs require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study through other objective measures. An acceptable GRE score is one of the requirements for students without the 2.7 undergraduate grade point average.
- Three recommendations regarding the prospective graduate student’s potential for doing master’s level work, which, depending upon the student’s status at the time, may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A statement describing the student’s background and career goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

**Licensure And Master’s Program (LAMP) in Early Childhood Education and Special Education**

The licensure and master’s program (LAMP) is a unique program for providing an initial license for those individuals who are seeking a career change and are interested in becoming a teacher. The LAMP provides a sequence of courses which lead to teacher licensure from the State of Ohio and a master’s degree in education. Licensure may be obtained in early childhood education (grades PreK-3), or special education (K-12). The program is designed to provide the student with many opportunities to participate in school settings and to use these experiences into perspective through on-campus reflective seminars.

**Admission Requirements for LAMP in Early Childhood Education and Special Education**

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work.
- Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A well-written statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
• All teacher licensure candidates are required to demonstrate basic competencies in reading, writing and mathematics. Candidates must receive acceptable scores on one of the following nationally normed assessments:
  a. ACT
    i. 20 each on math, reading, and writing sections
  b. SAT
    i. math 510
    ii. reading 500
    iii. writing 490
  c. Praxis Core Academic Skills for Educators (CASE)
    i. mathematics (test code 5732): minimum score 150
    ii. reading (test code 5712): minimum score 156
    iii. writing (test code 5722): minimum score 162
  d. GRE
    i. verbal reasoning 151
    ii. quantitative reasoning 153
    iii. writing 4.0

(required beginning 2021)

Licensure Programs
• Early childhood education (PreK-3)
• Intervention specialist: mild/moderate
• Intervention specialist: moderate/intensive

Endorsements
• Early intervention certificate – The Ohio Department of Developmental Disabilities offers this certificate to focus on teaching children with special needs who are age 0-3. The certificate can be added to a degree in education or a related area/degree (nursing, social work, psychology, speech pathology, OT, PT, etc.) and consists of 27 semester hours. This program can be completed entirely online.
• Gifted - The Ohio Department of Education offers the GT Endorsement (State of Ohio) with specific training in the nature and needs of Gifted, Talented and Creative (GTC) students. The program is moving towards being offered entirely online.
• Pre-School special needs – The Ohio Department of Education offers this endorsement on advanced skills and knowledge to work with young learners with disabilities. This endorsement may be added to a (a) K-12 Intervention Specialist, or (b) Early Childhood PK-3 teaching license. The Preschool Special Needs endorsement is 24 semester hours and can be completed 100% online.
• Transition to work – The Ohio Department of Education offers this endorsement on advanced skills and practices regarding working with learners with disabilities as they move from school-age services to adult services. This endorsement maybe added to a K-12 Intervention Specialist license, and consists of 16 semester hours. The Transition to Work endorsement can be completed entirely online.

Requirements for endorsements may be met as part of the M.Ed. degree – see advisor for details.

Requirements for Master's Degree Programs in Early Childhood Education and Special Education

Master's programs in early childhood and special education require a minimum of 36 semester hours of approved graduate course work. No more than a total of six semester hours of credit from workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

• A plan of study identifying the courses for the master's degree is required after 12 credit hours, generally at the end of the first semester of full time study.
• All students completing one of the master's degrees in early childhood and special education must fulfill core requirements by completing one course from each of the four foundations core areas within the first 18 semester hours of course work (four of the first six courses must be core courses).
• All course work for the master's degree must be taken within a six-year period immediately preceding the date the degree is awarded.
• The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.
• Programs leading to licensure or endorsement may require additional semester hours to fulfill licensure credential as well as degree requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tr>
<td>RESM 5110</td>
<td>Quantitative Methods I</td>
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<td>RESM 5210</td>
<td>Educational Testing And Grading</td>
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<tr>
<td>RESM 5310</td>
<td>Educational Research</td>
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<tr>
<td>RESM 5330</td>
<td>Qualitative Research I: Introduction And Basic Methods</td>
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<td>TSOC 5100</td>
<td>Group Processes In Education</td>
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<tr>
<td>TSOC 5110</td>
<td>Modern Educational Controversies</td>
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<tr>
<td>TSOC 5200</td>
<td>Sociological Foundations Of Education</td>
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<tr>
<td>TSOC 5210</td>
<td>Multicultural Non-Sexist Education</td>
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TSOC 5230  Intergroup And Intercultural Education  
TSOC 5300  Philosophy And Education  
TSOC 5400  History Of Schooling & Teaching In The U.s.  
TSOC 5500  Anthropology And Education  

Curriculum Core  
CIEC 5340  Infant/Toddler Curriculum  
or CIEC 6310  Pre-K/Primary Curriculum  

Specialization  
Select courses pre-approved by the faculty advisor  18  

Theory and Research Requirement  
CIEC 6950  Theory And Research In Early Childhood  3  

Seminar, Project, or Thesis  
Select one of the following:  3  
CIEC 6900  Masters Research Seminar In Early Childhood Education  
CIEC 6920  Masters Research Project In Early Childhood Education  
CIEC 6960  Masters Thesis In Early Childhood Education  

Total Hours  36  

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. See the description of the licensure and master’s program (LAMP) section. Students should consult their advisor for detailed information.  

Sample program of study for the master of education in early childhood education PreK-3:  

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>First Term</td>
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<tr>
<td>CIEC 6330</td>
<td>Language And Concept Development</td>
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</tr>
<tr>
<td>CIEC 6750</td>
<td>Developmental And Classroom Assessment</td>
<td>3</td>
</tr>
<tr>
<td>EDP core</td>
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<tr>
<td>TSOC core</td>
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<td></td>
<td>Hours</td>
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<tr>
<td>Second Term</td>
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<tr>
<td>CIEC 6310</td>
<td>Pre-K/Primary Curriculum</td>
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<tr>
<td>RESM core</td>
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<tr>
<td>Elective</td>
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<td>3</td>
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<tr>
<td></td>
<td>Hours</td>
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<tr>
<td>Third Term</td>
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<tr>
<td>CIEC 6320</td>
<td>Meaning And Development Of Play Behavior</td>
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<tr>
<td>Elective</td>
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<tr>
<td></td>
<td>Hours</td>
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<tr>
<td>Fourth Term</td>
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<td></td>
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<tr>
<td>Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CIEC 6950</td>
<td>Theory And Research In Early Childhood</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>6</td>
</tr>
</tbody>
</table>

1 With pre-approval of the graduate advisor.  

Master of Education in Higher Education  
The master’s program in higher education is offered in two formats with differing requirements for admission. The on-campus Master of Education in Higher Education is a 36-credit master’s program that includes coursework and a practicum experience in the higher education setting. The Online Professional Master of Education in Higher Education is a cohort-based, 30-credit master’s program that is offered online.  

Admission to Master’s Degree Programs in Early Childhood and Special Education  
In addition to the College of Graduate Studies admission requirements, early childhood and special education master’s programs require the following:  

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study through other objective measures. An acceptable GRE score is one of the requirements for students without the 2.7 undergraduate grade point average.  
- Three recommendations regarding the prospective graduate student’s potential for doing master’s level work, which, depending upon the student’s status at the time, may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.  
- A statement describing the student’s background and career goals as well as the importance of the degree in achieving those goals.  
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.  

On-Campus Master of Education in Higher Education  
Admission  
- A baccalaureate degree granted by an accredited institution, with a minimum GPA of 2.7.  
- Official transcripts from all previous higher education institutions attended.
• A statement of purpose indicating a commitment to pursuing a career in the field of higher education.
• 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.
• A current resume or curriculum vitae.

Meeting the minimum admission requirements does not guarantee entrance into the program. Admission is competitive and is dependent on the availability of space within the program. Under special circumstances, the graduate admissions committee may choose to admit a promising applicant as a provisional student in the program.

Online Professional Master of Education in Higher Education

30 hours

Admission

• At least two years’ work experience in a higher education setting
• A completed Graduate School admissions form, https://apply.utoledo.edu/apply.utoledo.edu/prod/bwskalog.p_displloginnew
• A baccalaureate degree granted by an accredited institution, with a minimum GPA of 2.7. ¹
• Official transcripts from all previous higher education institutions attended.
• A personal statement
• Three letters of recommendation.
• A current resume or curriculum vitae

¹ Students who fail to meet this requirement may be considered for provisional admission if they demonstrate excellent promise for graduate study through other objective measures.

Requirements for Master’s Degree Programs in Early Childhood Education and Special Education

Master’s programs in early childhood and special education require a minimum of 36 semester hours of approved graduate course work. No more than a total of six semester hours of credit from workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

• A plan of study identifying the courses for the master’s degree is required after 12 credit hours, generally at the end of the first semester of full time study.
• All students completing one of the master’s degrees in early childhood and special education must fulfill core requirements by completing one course from each of the four foundations core areas within the first 18 semester hours of course work (four of the first six courses must be core courses).
• All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.

On-Campus Master of Education in Higher Education

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>HED 6010</td>
<td>History Of Higher Education</td>
<td>3</td>
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<td>HED 6640</td>
<td>Governance And Administration In Higher Education</td>
<td>3</td>
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<tr>
<td>HED 6530</td>
<td>Theories Of Student Development</td>
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<tr>
<td>HED 6940</td>
<td>Master’s Practicum In Higher Education</td>
<td>1-3</td>
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Learning Environments

Select three of the following: 9

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>HED 6770</td>
<td>Evaluation And Outcomes Assessment In Higher Education</td>
</tr>
<tr>
<td>HED 6410</td>
<td>College &amp; University Curriculum</td>
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<td>HED 6510</td>
<td>The American College Student</td>
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<tr>
<td>HED 6850</td>
<td>Critical Issues In Higher Education</td>
</tr>
<tr>
<td>HED 6810</td>
<td>Women In Higher Education</td>
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<tr>
<td>HED 6120</td>
<td>International Education</td>
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Institutional Administration

Select two of the following: 6

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<tbody>
<tr>
<td>HED 6730</td>
<td>Legal Aspects Of Higher Education</td>
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<tr>
<td>HED 6520</td>
<td>Organization &amp; Management Of Student Affairs</td>
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<tr>
<td>HED 6700</td>
<td>Finance Of Higher Education</td>
</tr>
<tr>
<td>HED 6790</td>
<td>Managing College And University Personnel</td>
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Diversity and Multiculturalisms

Select one of the following: 3-4

<table>
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<tr>
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<tbody>
<tr>
<td>HED 5910</td>
<td>Diversity Beginnings</td>
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<td>HED 5960</td>
<td>Diversity in Practice</td>
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<td>HED 5970</td>
<td>Diversity Advancement</td>
</tr>
<tr>
<td>HED 6540</td>
<td>HED 6540 Advising Diverse Students</td>
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Research

<table>
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</thead>
<tbody>
<tr>
<td>HED 6570</td>
<td>Research in Higher Education</td>
</tr>
</tbody>
</table>

Culminating Experiences

HED 6980 | Master’s Capstone Seminar 1-3
or HED 6960 | Master’s Thesis In Higher Education

Total Hours 32-37

¹ The Practicum Seminar is comprised of 2 components:
1. 10 hours of coursework (or 4 class meetings during the semester) culminating in the completion of one or two projects, and
2. practicum experience hours (100 hours in one unit). The practicum experience hours can be waived for full-time employees of a college or university (upon documented proof).
## Online Professional Master of Education in Higher Education

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HED 6010</td>
<td>History Of Higher Education</td>
<td>3</td>
</tr>
<tr>
<td>HED 6510</td>
<td>The American College Student</td>
<td>3</td>
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<tr>
<td>HED 6640</td>
<td>Governance And Administration In Higher Education</td>
<td>3</td>
</tr>
<tr>
<td>HED 6570</td>
<td>Research in Higher Education</td>
<td>3</td>
</tr>
<tr>
<td>HED 6700</td>
<td>Finance Of Higher Education</td>
<td>3</td>
</tr>
<tr>
<td>HED 6770</td>
<td>Evaluation And Outcomes Assessment In Higher</td>
<td>3</td>
</tr>
</tbody>
</table>

### Professional Emphasis

These are cohort specific and required - not electives

#### Higher Education Administration

- HED 6730: Legal Aspects Of Higher Education (3)
- HED 6750: Strategic Planning And Decision Making (3)
- HED 6790: Managing College And University Personnel (3)
- HED 6850: Critical Issues In Higher Education (Focus on Higher Education Administration) (3)

#### The Community College

- HED 6210: The Community College (3)
- HED 6250: Technical Higher Education (3)
- HED 6650: Community College Leadership (3)
- HED 6850: Critical Issues In Higher Education (Focus on the Community College) (3)

#### Globalization of Higher Education

- HED 5930: Interdisciplinary Seminar (3)
- HED 5950: Workshop In Higher Education (1-3)
- HED 6120: International Education (3)
- HED 6850: Critical Issues In Higher Education (Focus on Globalization in Higher Education) (3)

#### Student Affairs

- HED 6520: Organization & Management Of Student Affairs (3)
- HED 6530: Theories Of Student Development (3)
- HED 6510: The American College Student (3)
- HED 6850: Critical Issues In Higher Education (Focus on Student Affairs) (3)

### Total Hours

Total Hours: 64-66

## Master of Education in Special Education

### Admission to Master's Degree Programs in Early Childhood and Special Education

In addition to the College of Graduate Studies admission requirements, early childhood and special education master's programs require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study through other objective measures. An acceptable GRE score is one of the requirements for students without the 2.7 undergraduate grade point average.
- Three recommendations regarding the prospective graduate student's potential for doing master's level work, which may come from sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant's ability to engage in graduate work in the desired program.
- A statement describing the student's background and career goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

## Licensure And Master's Program (LAMP) in Early Childhood Education and Special Education

The licensure and master's program (LAMP) is a unique program for providing an initial license for those individuals who are seeking a career change and are interested in becoming a teacher. The LAMP provides a sequence of courses which lead to teacher licensure from the State of Ohio and a master's degree in education. Licensure may be obtained in early childhood education (grades PreK-3), or special education (K-12). The program is designed to provide the student with many opportunities to participate in school settings and to put these experiences into perspective through on-campus reflective seminars.

### Admission Requirements for LAMP in Early Childhood Education and Special Education

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work.
- Three letters of recommendation regarding the prospective graduate student's potential for doing master's level work, which may come from such sources as the undergraduate major advisor, current employer, school principal or others who are knowledgeable about the applicant's ability to engage in graduate work in the desired program.
- A well-written statement describing the student's background and goals as well as the importance of the degree in achieving those goals.
- All teacher licensure candidates are required to demonstrate basic competencies in reading, writing and mathematics. Candidates must receive acceptable scores on one of the following nationally normed assessments:
  a. ACT
     i. 20 each on math, reading, and writing sections
  b. SAT
     i. math 510
     ii. reading 500
     iii. writing 490
  c. Praxis Core Academic Skills for Educators (CASE)
Licensure Programs

- Early childhood education (PreK-3)
- Intervention specialist: mild/moderate
- Intervention specialist: moderate/intensive

Endorsements

- Early intervention certificate – The Ohio Department of Developmental Disabilities offers this certificate to focus on teaching children with special needs who are age 0-3. The certificate can be added to a degree in education or a related area/degree (nursing, social work, psychology, speech pathology, OT, PT, etc.) and consists of 27 semester hours. This program can be completed entirely online.

- Gifted - The Ohio Department of Education offers the GT Endorsement (State of Ohio) with specific training in the nature and needs of Gifted, Talented and Creative (GTC) students. The program is moving towards being offered entirely online.

- Pre-School special needs – The Ohio Department of Education offers this endorsement on advanced skills and knowledge to work with young learners with disabilities. This endorsement may be added to a (a) K-12 Intervention Specialist, or (b) Early Childhood PK-3 teaching license. The Preschool Special Needs endorsement is 24 semester hours and can be completed 100% online.

- Transition to work – The Ohio Department of Education offers this endorsement on advanced skills and practices regarding working with learners with disabilities as they move from school-age services to adult services. This endorsement maybe added to a K-12 Intervention Specialist license, and consists of 16 semester hours. The Transition to Work endorsement can be completed entirely online.

Requirements for endorsements may be met as part of the M.Ed. degree – see advisor for details.

Requirements for Master’s Degree Programs in Early Childhood Education and Special Education

Master’s programs in early childhood and special education require a minimum of 36 semester hours of approved graduate course work. No more than a total of six semester hours of credit from workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

- A plan of study identifying the courses for the master’s degree is required after 12 credit hours, generally at the end of the first semester of full time study.

- All students completing one of the master’s degrees in early childhood and special education must fulfill core requirements by completing one course from each of the four foundations core areas within the first 18 semester hours of course work (four of the first six courses must be core courses).

- All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.

- The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

- Programs leading to licensure or endorsement may require additional semester hours to fulfill licensure credential as well as degree requirements.

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- The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

- Programs leading to licensure or endorsement may require additional semester hours to fulfill licensure credential as well as degree requirements.
SPED 5250  Career And Vocational Education For Students With Disabilities

SPED 6070  Curriculum Models And Intervention Strategies In Early Childhood Special Education

Students with an undergraduate degree in special education. Select one of the following:

SPED 6470  Theory And Research: Autism
CIEC 5340  Infant/Toddler Curriculum
CIEC 6310  Pre-K/Primary Curriculum

Specialization
Select 18 credits. Areas of focus may include, but are not limited to: 1 18

- general special education
- special education
- transition to work
- behavior disorders

Culminating Experience

SPED 6930  Seminars In Special Education 3
Select one of the following: 3

- SPED 6930  Seminars In Special Education (Exam)
- SPED 6920  Master's Research Project In Special Education
- SPED 6960  Master Research Thesis In Special Education

Total Hours 36

1  Courses must be pre-approved by the faculty advisor.

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. See the description of the licensure and master's program (LAMP) section. Students should consult their advisor for detailed information.

Sample program of study for the master of education in special education: focus on early childhood special education:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Term</td>
<td></td>
<td></td>
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<tr>
<td>SPED 5170</td>
<td>Supporting Youths And Adults With Disabilities Living And Working In The Community</td>
<td>3</td>
</tr>
<tr>
<td>EDP core</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>TSOC core</td>
<td></td>
<td>3</td>
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<td>9</td>
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<tr>
<td>Second Term</td>
<td></td>
<td></td>
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<tr>
<td>SPED 6250</td>
<td>Issues And Research In Transitin And Post-Secondary Outcomes For Student With Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>RESM core</td>
<td></td>
<td>3</td>
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<tr>
<td>Curriculum core</td>
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<td>3</td>
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<td>9</td>
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<tr>
<td>Third Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPED 5260</td>
<td>Family And Professional Relations In Special Education</td>
<td>3</td>
</tr>
<tr>
<td>CTE 5080</td>
<td>Principles Of School-To-work Transition</td>
<td>3</td>
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<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Fourth Term</td>
<td></td>
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</tr>
<tr>
<td>SPED 6940</td>
<td>Internship/Externship In Special Education</td>
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<tr>
<td>Elective 1</td>
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<tr>
<td>Fifth Term</td>
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<tr>
<td>SPED 6930</td>
<td>Seminars In Special Education (Seminar)</td>
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<td>SPED 6930</td>
<td>Seminars In Special Education (Comp Exam)</td>
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<td>6</td>
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<tr>
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</tbody>
</table>

1  With pre-approval of the graduate advisor.

PhD in Curriculum and Instruction: Emphasis in Early Childhood
Admission to the Doctoral Programs in Curriculum and Instruction (Emphasis Areas in Early Childhood or Special Education)

Individuals applying for admission to doctoral study must meet the admission requirements of the College of Graduate Studies as well as specific program requirements.

- A minimum 3.25 cumulative GPA, using a 4.0 scale, on all previous graduate academic work with a completed master's degree.
- Acceptable GRE scores with 50 percentile or higher preferred (taken within the last five years).
- Evidence in prerequisite academic work that the applicant can successfully complete the doctoral program in the area of study.
- An autobiographical sketch that describes why the applicant wishes to pursue the selected doctoral program. This sketch also should include 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 the applicant believes is relevant for admission into the desired program.
- Evidence of research and writing ability. Such evidence may include 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 in this respect.
- Evidence of successful teaching experience is preferred.

Requirements for Doctoral Programs in Curriculum and Instruction (Emphasis in Early Childhood or Special Education)

A minimum of 60 hours beyond the master's degree is required. Each doctoral student is expected to:

- Identify a concentration in an area of specialization (i.e., a major) and pass a written examination (major examination);
- Demonstrate proficiency in tools of research;
- After passing the written major examination, pass an oral examination that covers the relevant coursework;
- Present a dissertation proposal;
- Present and defend a completed dissertation in a public forum.

Academic Advising Committee

The student is assigned an initial advisor upon admission to a program. This advisor guides the student in forming a doctoral program committee.

The doctoral program committee is to be formed before the student completes 18 hours of credit. 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 doctoral major exam and doctoral program orals.

The plan of study must be approved by the doctoral program committee, the department chairperson, and the Associate Dean of the college. The plan of study must be filed before 18 semester hours of the doctoral program are completed. After completion of the academic requirements, the student must form a dissertation committee to guide the development of the dissertation.

Dissertation

The dissertation committee must include a minimum of four graduate faculty members including one who is not in the discipline major. The members of the dissertation often include members from the doctoral program committee. The student must work closely with the committee to develop a research proposal for the dissertation. Once the committee approves the research design, the student must obtain Institutional Research Board approval before beginning the research study. A public defense of the dissertation is required.

All coursework and requirements for the doctoral degree should be completed in the seven year period immediately preceding the awarding of the degree.

PhD in Curriculum and Instruction: Emphasis in Special Education

Admission to the Doctoral Programs in Curriculum and Instruction (Emphasis Areas in Early Childhood or Special Education)

Individuals applying for admission to doctoral study must meet the admission requirements of the College of Graduate Studies as well as specific program requirements.

- A minimum 3.25 cumulative GPA, using a 4.0 scale, on all previous graduate academic work with a completed master's degree.
- Acceptable GRE scores with 50 percentile or higher preferred (taken within the last five years).
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The plan of study must be approved by the doctoral program committee, the department chairperson, and the Associate Dean of the college. The plan of study must be filed before 18 semester hours of the doctoral program are completed. After completion of the academic requirements, the student must form a dissertation committee to guide the development of the dissertation.

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All coursework and requirements for the doctoral degree should be completed in the seven year period immediately preceding the awarding of the degree.

PhD in Early Childhood Education, Higher Education, & Special Education

The department offers a doctoral degree in curriculum and instruction with a focus on special education or early childhood education, as well as a doctoral degree in higher education.

PhD in Higher Education

The doctoral program 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.

• Currently employed at a college or university.
• A completed College of Graduate Studies admissions form.
• A baccalaureate degree granted by an accredited institution, with a minimum GPA of 2.7 preferred.
• A master's degree granted by an accredited institution, with a minimum GPA of 3.25.
• Official transcripts from all previous higher education institutions attended.
• A letter indicating the applicant's commitment to pursuing a career in the field of higher education, and a description of the applicant's potential research topic for dissertation study.
• A 1,000-word essay that discusses the most critical issue facing higher education today, the reasons for choosing this issue, and the implications of the issue for the future of higher education.
• Two letters of reference, including at least one from a faculty member who can speak to the ability of the applicant to conduct research and to write at the graduate level.
• A current resume or curriculum vitae.

A minimum of 61 hours beyond the master's degree is required.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>HED 8030</td>
<td>Federal And State Policy Analysis</td>
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<td>HED 8530</td>
<td>Theories Of Student Development</td>
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<td>HED 8570</td>
<td>Research In Higher Education</td>
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</tr>
<tr>
<td>HED 8640</td>
<td>Governance And Administration In Higher Education</td>
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<tr>
<td>or HED 7980</td>
<td>Special Topics In Higher Education</td>
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<td>HED 8700</td>
<td>Finance Of Higher Education</td>
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<td>HED 8770</td>
<td>Evaluation And Outcomes Assessment In Higher Education</td>
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<td>HED 8850</td>
<td>Critical Issues In Higher Education</td>
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<tr>
<td>HED 8790</td>
<td>Managing College And University Personnel</td>
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<td>HED 8730</td>
<td>Legal Aspects Of Higher Education</td>
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<td>HED 8120</td>
<td>International Education</td>
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Elective Courses

Select six hours of HED courses 6

Higher Education Requirement

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<tbody>
<tr>
<td>HED 8010</td>
<td>History Of Higher Education (or TSOC Requirement)</td>
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</table>

Research Methods Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>RESM 8120</td>
<td>Quantitative Methods II</td>
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</tr>
<tr>
<td>HED 8910</td>
<td>Introduction to Interpretive Inquiry</td>
<td>3</td>
</tr>
<tr>
<td>or RESM 7330</td>
<td>Qualitative Research I: Introduction And Basic Methods</td>
<td></td>
</tr>
</tbody>
</table>
HED 8920 Advanced Seminar 3
or RESM 8320 Research Design
HED 8920 Advanced Seminar 3

Dissertation
HED 8930 Doctoral Research Seminar In Higher Education
(Concept Paper) 3
HED 8930 Doctoral Research Seminar In Higher Education
(Literature Review) 3
HED 8960 Dissertation 4
Total Hours 61

In addition, each doctoral student is expected to:

• Concentrate in the area of specialization (i.e. a major) and pass a written examination (major examination) in the major area of concentration;
• Demonstrate proficiency in tools of research;
• Pass the written major examination and pass an oral examination that covers the relevant coursework;
• Orally present and defend a dissertation proposal in a public forum;
• Orally present and defend a completed dissertation in a public forum.

Academic Advising Committee
The student is assigned an initial advisor upon admission to a program. This advisor guides the student in forming a doctoral program committee.

The doctoral program committee shall be formed before the student completes 18 hours of credit. The doctoral program committee has a minimum of three members, at least two of which must be members of the Higher Education Program, 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 doctoral major exam, and the doctoral program oral.

The plan of study must be approved by the doctoral program committee, the department chairperson, and the associate dean of the college. The plan of study must be filed before 18 semester hours of the doctoral program are completed. After completion of the academic requirements, the student must form a dissertation committee to guide the development of the dissertation.

Dissertation
The dissertation committee must include a minimum of four graduate faculty members, and one who is not in the discipline major. Members of the dissertation committee may also be members of the doctoral program committee. The student must work closely with the committee to develop a research proposal for the dissertation. Once the committee approves the research design, the student must obtain Institutional Research Board approval before beginning the research study. A public, oral defense of the dissertation proposal and the completed dissertation is required.

Department of Educational Foundations and Leadership
Edward Janak, chair

The mission of the department of educational foundations and leadership (EDFL) is to prepare and develop educational leaders and scholars to be agents of transformation on all levels of educational systems. A learning paradigm informs our graduate programs, which are student-centered, inquiry-based, and integrated in terms of theory and practice, and grounded in the mission of the Judith Herb College of Education. We offer graduate degrees (Master's, Ed.S., Ed.D., and Ph.D.) in educational administration and supervision, educational psychology, research and measurement, and social foundations of education (including philosophy, sociology, and history of education).

The department is also the home of the Center for Nonviolence and Democratic Education (CNDE).

The Educational Administration and Supervision Program is accredited by the Council of Accreditation of Educator Preparation (CAEP).

Doctoral Degree Programs
The department offers several doctoral degrees: the doctor of education (Ed.D.) in education administration and supervision, and the doctor of philosophy (Ph.D.) in the foundations of education majors of educational psychology, educational research and measurement, educational sociology, and foundations of education. Most doctoral programs are available as minor areas of study for other doctoral programs that require a minor. Additional areas of study for the minor are available within the college, as well as areas from other colleges at The University of Toledo. Students should discuss these alternatives with their advisors.

Degrees Offered

• Culture and Change in Institutions Graduate Certificate Program (p. 377)
• DE in Educational Administration and Supervision (p. 377)
• EdS in Administration and Supervision (p. 378)
• Educational Assessment Specialist Certificate (p. 379)
• Foundations of Peace Education Certificate Program (p. 379)
• Higher Education Administration Certificate (p. 380)
• ME in Educational Administration and Supervision (p. 380)
• ME in Educational Psychology (p. 381)
• ME in Educational Research and Measurement (p. 382)
• ME in Educational Theory and Social Foundations (p. 383)
• PhD in Foundations of Education (p. 384)
• PhD in Foundations of Education: Educational Psychology (p. 385)
• PhD in Foundations of Education: Educational Sociology (p. 386)
• PhD in Foundations of Education: History of Education (p. 387)
• PhD in Foundations of Education: Philosophy of Education (p. 388)
• PhD in Foundations of Education: Research and Measurement (p. 389)
EDAS 5950 Workshop In Educational Administration  
[3 credit hours (3, 0, 0)]
Topical workshops, based on practical application of skills and knowledge, are intended for in-service educational professionals. Credit may be applied to doctoral degrees upon approval of the committee.

EDAS 5980 Special Topics In Educational Administration  
[3 credit hours (3, 0, 0)]
Courses, based on issues, topics and concerns of educational administrators for the real world. Credit may be applied to degree programs upon approval of the adviser or committee.

EDAS 6000 The Individual In Organizations  
[3 credit hours (3, 0, 0)]
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.

EDAS 6010 Leadership in School Curriculum  
[3 credit hours (3, 0, 0)]
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.

EDAS 6020 Instructional Leadership and Supervision  
[3 credit hours (3, 0, 0)]
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.

EDAS 6030 Developing Effective Learning Environments  
[3 credit hours (3, 0, 0)]
An exploration of group dynamics/processes and the intrapersonal and principles of high performing teams and being an effective leader. Development of effective action plans to improve school climate/culture and the learning environment is explored using problem-based learning.

EDAS 6100 Legal Aspects Of School Administration  
[3 credit hours (3, 0, 0)]
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.

EDAS 6110 Legal Aspects Of School Administration  
[3 credit hours (3, 0, 0)]
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.

EDAS 6150 The Administrative Experience  
[3 credit hours (3, 0, 0)]
Emphasis is on blending current theory and practice by examining the use of data to guide school improvement for students. The collection of meaningful data for focused goal setting to be employed at the district, building and classroom levels is operationalized.

EDAS 6190 Integrated Experiences: Practicum  
[3 credit hours (3, 0, 0)]
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 portfolio.

EDAS 6200 Continuous Improvement Of Schools  
[3 credit hours (3, 0, 0)]
Course addresses current Pre K-16 national and regional reform agendas, relating them to systemic changes in policies, governance and articulation of learner outcomes in local settings.

EDAS 6210 Leadership In Diverse Settings  
[3 credit hours (3, 0, 0)]
Issues of multicultural, cross-cultural, race, gender, and ethnicity in school settings are examined in diverse settings in order to develop leaders who can apply theoretical frameworks and analytical skills to improve educational performance in local, urban, suburban, rural and global setting.

EDAS 6220 Administration Of Special Programs  
[3 credit hours (3, 0, 0)]
This course examines the administration of special programs that operate at the district and school level with particular focus on Special Education leadership issues. Title I, ESL, vocational education, guidance, and athletic programs are also explored.

EDAS 6230 Community And Schools  
[3 credit hours (3, 0, 0)]
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.

EDAS 6240 Developing Learning Organizations In Educational Settings  
[3 credit hours (3, 0, 0)]
Course introduces the theories, techniques and practices of planned organizational learning. Students examine the philosophical, theoretical and practical differences of organizational development as interventionist, consultative and collaborative processes in charter schools.

EDAS 6250 School Business Management  
[3 credit hours (3, 0, 0)]
The purpose of the course is to involve students in an analysis of the role and functions of school business management. Participants will analyze data in each topical area of school business management.

EDAS 6310 Collective Bargaining And Dispute Resolution  
[3 credit hours (3, 0, 0)]
The purpose of the course is to examine the issues that arise before, during and after the collective bargaining process in the public sector, including resolving labor disputes and grievances.
EDAS 6350 Computers In Educational Administration Decision Making
[3 credit hours (3, 0, 0)]
This course allows the development for increased decision making based on local, state and national retrievable data concerning learning, achievement, efficiency and effectiveness of resource allocations.

EDAS 6360 Personnel Management And Contract Administration In Education
[3 credit hours (3, 0, 0)]
Course provides insight into the purposes, policies and processes of personnel administration and contract administration in public education, including recruitment, hiring, induction, evaluation, compensation and development.

EDAS 6380 Planning Educational Facilities For Learning
[3 credit hours (3, 0, 0)]
This course examines the issues surrounding planning, building and maintaining educational facilities appropriate for maximizing learning. Included is an examination of legal, health and safety requirements.

EDAS 6420 Micropolitics Of School Communities
[3 credit hours (3, 0, 0)]
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.

EDAS 6430 Legal Aspects Of Educational Administration
[3 credit hours (3, 0, 0)]
This course provides students a background in legislation and court decisions that affect the administration of public schools. Students will investigate legal problem areas in schools.

EDAS 6440 Equity Issues In Educational Finance And Economics
[3 credit hours (3, 0, 0)]
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.

EDAS 6900 Master's Seminar In Educational Administration And Supervision
[3 credit hours (0, 0, 3)]
Examination and reflection on the practice of research in Educational Leadership.

EDAS 6920 Master's Project In Educational Administration
[1-3 credit hours (0, 0, 0-1)]
Open to graduate students who elect the completion of a research project in fulfilling the research requirements of the master's program.

EDAS 6960 Master's Thesis In Educational Administration
[1-3 credit hours (0, 0, 0-1)]
Open to graduate students who elect the completion of a research thesis in fulfilling the research requirements of the master's program.

EDAS 6990 Individual Study In Educational Administration - Master's
[1-3 credit hours (0, 0, 0-1)]
Open to graduate students who wish to pursue individual study on professional problems in EDAS under the direction of an EDAS faculty member.

EDAS 7920 Specialist Project In Educational Administration
[1-3 credit hours (0, 0, 0-1)]
Open to graduate students to fulfill the completion of a research project in fulfilling the research requirements of the specialist program.

EDAS 7950 Workshop In Educational Administration
[3 credit hours (3, 0, 0)]
Topical workshops, based on practical application of skills and knowledge, are intended for in-service educational professionals. Credit may be applied to degree programs upon approval of the advisor or committee.

EDAS 7980 Special Topics In Educational Administration
[3 credit hours (3, 0, 0)]
Courses, based on issues, topics and concerns of educational administrators for the real world. Credit may be applied to doctoral degrees upon approval of the committee.

EDAS 7990 Independent Study In Education Administration
[1-3 credit hours (0, 0, 0-3)]
Individual study on professional problems in EDAS under the direction of a EDAS faculty member.

EDAS 8010 Supervision For Improved Instruction
[3 credit hours (0, 0, 0)]
An examination of those principles of supervision which promote improved instruction. Emphasis is on teacher performance evaluation, curriculum management and strategies for staff development to improve staff performance.

EDAS 8020 Instructional Leadership
[3 credit hours (3, 0, 0)]
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.

EDAS 8030 Developing Effective Learning Environments
[3 credit hours (3, 0, 0)]
An exploration of group dynamics/processes and the intrapersonal and principles of high performing teams and being an effective leader. Development of effective action plans to improve school climate/culture and the learning environment is explored using problem-based learning.
EDAS 8110 Legal Aspects Of School Administration
[3 credit hours (3, 0, 0)]
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

EDAS 8150 The Administrative Experience
[3 credit hours (3, 0, 0)]
Emphasis is on blending current theory and practice by examining the use of data to guide school improvement for students. The collection of meaningful data for focused goal setting to be employed at the district, building and classroom levels is operationalized.
Term Offered: Spring

EDAS 8190 Integrated Experiences In Education Administration
[3 credit hours (0, 0, 3)]
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 8200 Continuous Improvement Of Schools
[3 credit hours (3, 0, 0)]
Course addresses current Pre K-16 national and regional reform agendas for charter schools, relating them to systemic changes in policies, governance and articulation of learner outcomes in local settings.

EDAS 8210 Leadership In Diverse Settings
[3 credit hours (3, 0, 0)]
Issues of multicultural, cross-cultural, race, gender, and ethnicity in school settings are examined in diverse settings in order to develop leaders who can apply theoretical frameworks and analytical skills to improve educational performance in local, urban, suburban, rural and global setting

EDAS 8220 Administration Of Special Programs
[3 credit hours (3, 0, 0)]
This course examines the administration of special programs that operate at the district and school level with particular focus on Special Education leadership issues. Title I, ESL, vocational education, guidance, and athletic programs are also explored.
Term Offered: Summer

EDAS 8230 Community And Schools
[3 credit hours (3, 0, 0)]
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 8240 Developing Learning Organizations In Educational Settings
[3 credit hours (3, 0, 0)]
Course introduces the theories, techniques and practices of planned organizational learning. Students examine the philosophical, theoretical and practical differences of organizational development as interventionist, consultative and collaborative processes in charter schools.

EDAS 8300 Integrate Experiences: Policies In Action
[3 credit hours (0, 0, 3)]
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 8310 School District Leadership
[3 credit hours (0, 0, 0)]
Analysis of duties, roles and responsibilities of local school district leadership. Specific competencies of building school support, planning, curriculum development, personnel, legal, financial and planning are covered.

EDAS 8320 School Business Management
[3 credit hours (3, 0, 0)]
The purpose of the course is to involve students in an analysis of the role and functions of school business management. Participants will analyze data in each topical area of school business management.

EDAS 8330 Collective Bargaining And Dispute Resolution
[3 credit hours (3, 0, 0)]
The purpose of the course is to examine the issues that arise before, during and after the collective bargaining process in the public sector, including resolving labor disputes and grievances.

EDAS 8350 Computers In Educational Administration Decision Making
[3 credit hours (3, 0, 0)]
This course allows the development for increased decision making based on local, state and national retrievable data concerning learning, achievement, efficiency and effectiveness of resource allocations.

EDAS 8360 Personnel Management And Contract Administration In Education
[3 credit hours (3, 0, 0)]
Course provides insight into the purposes, policies and processes of personnel administration and contract administration in public education, including recruitment, hiring, induction, evaluation, compensation and development.

EDAS 8380 Planning Educational Facilities For Learning
[3 credit hours (3, 0, 0)]
This course examines the issues surrounding planning, building and maintaining educational facilities appropriate for maximizing learning. Included is an examination of legal, health and safety requirements.

EDAS 8420 Micropolitics Of School Communities
[3 credit hours (3, 0, 0)]
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 8430 Legal Aspects Of Educational Administration [3 credit hours (3, 0, 0)]
This course provides students a background in legislation and court decisions that affect the administration of public schools. Students will investigate legal problem areas in schools.

EDAS 8440 Equity Issues In Educational Finance And Economics [3 credit hours (3, 0, 0)]
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

EDAS 8600 Leadership And Organizational Theory [3 credit hours (3, 0, 0)]
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 8610 Organizational Behavior [3 credit hours (3, 0, 0)]
This course integrates the educational and management theories and knowledge bases on leadership, power, motivation and change to understand the internal and external dynamics of people in educational organizations.
Term Offered: Spring

EDAS 8620 Politics And Policy Analysis And Development [3 credit hours (3, 0, 0)]
This course examines the issues involved in policy formation and analysis along with the political process of public education. Local, intermediate, state and federal levels are considered.
Term Offered: Spring

EDAS 8640 Leading Systems Change [3 credit hours (3, 0, 0)]
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 8650 Interdisciplinary Perspectives In Educational Administration [3 credit hours (0, 0, 3)]
Seminar focused on interdisciplinary examination of critical issues in educational administration. Multiple theoretical lenses from sociology, political science, economics and science are used to address educational issues.

EDAS 8660 Critical Analysis Of Inquiry In Schools [3 credit hours (3, 0, 0)]
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: Fall

EDAS 8930 Doctoral Seminar In Educational Administration And Supervision [3 credit hours (0, 0, 3)]
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: Fall

EDAS 8940 Educational Administration Internship [3 credit hours (0, 0, 3)]
An advanced field/seminar experience for doctoral students with fieldwork at the school system level. Fieldwork employs application of graduate coursework under supervision by the school system and the university.

EDAS 8950 Doctoral Dissertation In Educational Administration And Supervision [1-12 credit hours (0, 0, 0-1)]
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 Basic Educational Psychology [3 credit hours (3, 0, 0)]
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 5120 Alternative Approaches To Discipline [3 credit hours (3, 0, 0)]
Reviews a variety of models, constructs and methodologies for addressing behavior and discipline problems, especially within school and family settings. Emphases are placed on individual and group approaches to discipline.

EDP 5210 Child Behavior And Development [3 credit hours (0, 0, 3)]
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 child growth and development.
Term Offered: Spring, Summer, Fall

EDP 5220 Adolescent Behavior And Development [3 credit hours (3, 0, 0)]
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 5230 Adult Development [3 credit hours (3, 0, 0)]
Emphasizes classical and modern theories of adulthood from a critical perspective, as well as applications of research on cognitive, physical, personality and social development from early adulthood through old age.
Term Offered: Summer, Fall
EDP 5240 Applied Child and Adolescent Development
[3 credit hours (3, 0, 0)]
The course will address issues that impact school and mental health professionals. For example K12 teachers, school psychologists, clinical psychologists, social workers, school counselors, nurses, SROs. Theory and research on physical, cognitive, social, and emotional development are examined and used as the bases for understanding child and adolescent development. Special attention will be focused on practical application.
Term Offered: Spring, Summer

EDP 5310 Issues And Innovations In Learning And Instruction
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 5330 Behavior Management
[3 credit hours (3, 0, 0)]
Theory and research related to behavioral and cognitive approaches to behavior management. Students will carry out research-based behavior management projects requiring behavioral analyses, observation, program design, development and evaluation.
Term Offered: Fall

EDP 5950 Workshop In Educational Psychology
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 6130 Human Coping In Adulthood
[3 credit hours (3, 0, 0)]
Considers models, research methodologies and constructs on coping in relation to a range of circumstances during the adult years. Emphasis is placed on coping behavior within an ecological context.
Term Offered: Spring

EDP 6140 Motivation Theory And Application
[3 credit hours (3, 0, 0)]
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 or EDP 5210 or EDP 5220 or EDP 5230 or EDP 7110 or EDP 7230
Term Offered: Spring

EDP 6150 CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 or EDP 5120 or EDP 5220 or EDP 5230 or PSY 4500 or PSY 4700

EDP 6190 Seminar In Educational Psychology
[3 credit hours (0, 0, 3)]
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 6240 Theories Of Development
[3 credit hours (3, 0, 0)]
Analysis and evaluation of theories of development with emphasis on the philosophical and psychological evolutionary history of the theories and their usefulness for individuals in the helping professions.
Prerequisites: EDP 5210 or EDP 5220

EDP 6250 Social Development
[3 credit hours (3, 0, 0)]
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 or EDP 5220
Term Offered: Fall

EDP 6260 Research Methods In Child And Adolescent Development
[3 credit hours (3, 0, 0)]
Builds upon basic understanding of development through direct experiences in child study. This course provides individual/small group experiences in the design, implementation and written/oral presentation of original research.
Prerequisites: EDP 5210 or EDP 5220
Term Offered: Fall
EDP 6270 Parenting: Theory And Research  
[3 credit hours (3, 0, 0)]  
Analysis and evaluation of the research on parenting across a variety of sociocultural contexts.  
**Prerequisites:** EDP 5320

EDP 6340 Theories Of Learning  
[3 credit hours (3, 0, 0)]  
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 6350 Advanced Topics In Cognition And Instruction  
[3 credit hours (3, 0, 0)]  
Theory and research on cognition related to learning/instruction, to include study of expertise, knowledge learned from experience, analysis of ill-structured domains, tacit knowledge, and knowledge representation.  
**Prerequisites:** (EDP 5110 and EDP 5320) or (EDP 7110 and EDP 7320)

EDP 6360 Thinking And Reasoning In School Contexts  
[3 credit hours (3, 0, 0)]  
Analysis of theory, research policy, and practice about thinking and reasoning in school subjects and school learning in democratic societies.  
**Term Offered:** Fall

EDP 6370 News Media Literacy, Society, and the Mind  
[3 credit hours (0, 0, 3)]  
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 become critical and effective news media consumers.

EDP 6380 Prevention Through Postvention in Targeted Violence  
Terrorism and Suicide  
[3 credit hours (3, 0, 0)]  
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 (0, 0, 0-3)]  
A formal, independent study culminating in a written discourse that advances our understanding of educational psychology.  
**Term Offered:** Spring, Fall

EDP 6980 Master's Project In Educational Psychology  
[1-3 credit hours (0, 0, 0-3)]  
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 (0, 0, 0-3)]  
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 Basic Educational Psychology  
[3 credit hours (3, 0, 0)]  
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 7230 Adult Development  
[3 credit hours (3, 0, 0)]  
Emphasizes classical and modern theories of adulthood from a critical perspective, as well as applications of research on cognitive, physical, personality and social development from early adulthood through old age.  
**Term Offered:** Summer, Fall

EDP 7240 Applied Child and Adolescent Development  
[3 credit hours (3, 0, 0)]  
The course will address issues that impact school and mental health professionals, for example K12 teachers, school psychologists, clinical psychologists, social workers, school counselors, nurses, and SROs. Theory and research on physical, cognitive, social, and emotional development are examined and used as the basis for understanding child and adolescent development. Special attention will be focused on practical application.  
**Term Offered:** Spring, Summer

EDP 7310 Issues And Innovations In Learning And Instruction  
[3 credit hours (3, 0, 0)]  
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 7320 Instructional Psychology  
[3 credit hours (3, 0, 0)]  
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 7330 Behavior Management  
[3 credit hours (3, 0, 0)]  
Theory and research related to behavioral and cognitive approaches to behavior management. Students will carry out research-based behavior management projects requiring behavioral analyses, observation, program design, development and evaluation.  
**Term Offered:** Fall

EDP 7950 Workshop In Educational Psychology  
[3 credit hours (3, 0, 0)]  
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 (0, 0, 3)]
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 8130 Human Coping In Adulthood
[3 credit hours (3, 0, 0)]
Considers models, research methodologies and constructs on coping in relation to a range of circumstances during the adult years. Emphasis is placed on coping behavior within an ecological context.
Term Offered: Spring

EDP 8140 Motivation Theory And Application
[3 credit hours (3, 0, 0)]
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 or EDP 5210 or EDP 5220 or EDP 5230 or EDP 7110 or EDP 7230
Term Offered: Spring

EDP 8150 CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 or EDP 5120 or EDP 5220 or EDP 5230 or EDP 7110 or EDP 7230
Term Offered: Spring, Fall

EDP 8180 Interdisciplinary Seminar In Foundations Of Education
[1 credit hour (0, 0, 1)]
The proseminar will enable doctoral students to improve their understanding of the research process. Students will learn to ask research questions, choose alternative methodologies and interpret the validity of conclusions.

EDP 8190 Seminar In Educational Psychology
[3 credit hours (0, 0, 3)]
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 8240 Theories Of Development
[3 credit hours (3, 0, 0)]
Analysis and evaluation of theories of development with emphasis on the philosophical and psychological evolutionary history of the theories and their usefulness for individuals in the helping professions.
Prerequisites: EDP 5210 or EDP 5220

EDP 8250 Social Development
[3 credit hours (3, 0, 0)]
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 or EDP 5220
Term Offered: Fall

EDP 8260 Research Methods In Child And Adolescent Development
[3 credit hours (3, 0, 0)]
Builds upon basic understanding of development through direct experiences in child study. This course provides individual/small group experiences in the design, implementation and written/oral presentation of original research.
Prerequisites: EDP 5210 or EDP 5220
Term Offered: Spring

EDP 8270 Parenting: Theory And Research
[3 credit hours (3, 0, 0)]
Analysis and evaluation of the research on parenting across a variety of sociocultural contexts.

EDP 8340 Theories Of Learning
[3 credit hours (3, 0, 0)]
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 8350 Advanced Topics In Cognition And Instruction
[3 credit hours (3, 0, 0)]
Theory and research on cognition related to learning/instruction, to include study of expertise, knowledge learned from experience, analysis of ill-structured domains, tacit knowledge, and knowledge representation.
Prerequisites: (EDP 5110 and EDP 5320) or (EDP 7110 and EDP 7320)

EDP 8360 Thinking And Reasoning In School Contexts
[3 credit hours (3, 0, 0)]
Analysis of theory, research policy, and practice about thinking and reasoning in school subjects and school learning in democratic societies.
Term Offered: Fall

EDP 8370 News Media Literacy, Society, and the Mind
[3 credit hours (0, 0, 3)]
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 (3, 0, 0)]
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.

RESM 5330 Qualitative Research I: Introduction And Basic Methods
[3 credit hours (3, 0, 0)]
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 5950 Workshop In Research And Measurement
[3 credit hours (0, 0, 3)]
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 or RESM 5110
Term Offered: Spring, Summer

RESM 6120 Quantitative Methods II
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Summer, Fall

RESM 6130 Multivariate Statistics
[3 credit hours (3, 0, 0)]
This course covers multivariate analysis of variance, canonical correlation, discriminant analysis, repeated measures and factor analysis. Computer applications are included.
Prerequisites: RESM 6120 or RESM 8120
Term Offered: Fall

RESM 6140 Advanced Quantitative Methods
[3 credit hours (3, 0, 0)]
This course exposes students to various experimental designs, such as complete and fractional factorial designs, repeated measures designs, and nested designs. Both the conceptual rationale and the computational procedures are covered.
Prerequisites: RESM 6120 or RESM 8120

RESM 6150 Structural Equation Modeling
[3 credit hours (3, 0, 0)]
This course introduces structural equation modeling as a statistical method to assess the strengths of a priori relations among variables. Topics include path analysis and confirmatory factor analysis. Computer applications with AMOS are included.
Prerequisites: RESM 6120 or RESM 8120

RESM 6160 Nonparametric Statistics
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Fall
RESM 6220 Measurement I
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Fall
RESM 6230 Measurement II
[3 credit hours (3, 0, 0)]
This course covers advanced measurement-related topics with a focus on IRT with emphasis on 1- 2- and 3-parameter logistic models, Generalizability, test equating, scaling, item/test bias detection methods and current issues.
Prerequisites: (RESM 6220 or RESM 8220) and RESM 5110
RESM 6320 Research Design
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Summer, Fall
RESM 6340 Qualitative Research II: Design And Analysis
[3 credit hours (3, 0, 0)]
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 or RESM 7330
Term Offered: Spring, Summer, Fall
RESM 6350 Methods Of Survey Research
[3 credit hours (3, 0, 0)]
This course contextualizes survey development within a broad theoretical framework and proceeds through the literature, problem, purpose, methods, and sampling. Particular emphasis is placed on the validity implications of each.
Prerequisites: RESM 6120
Term Offered: Fall
RESM 6360 Program Evaluation
[3 credit hours (3, 0, 0)]
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 or RESM 7110
Term Offered: Spring, Fall
RESM 6370 Fundamentals Of Grant Writing
[3 credit hours (3, 0, 0)]
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: Summer
RESM 6940 Internships In Measurement, Evaluation, Research & Statistics
[3 credit hours (0, 0, 8)]
This is a supervised field experience in measurement, evaluation, research design, or statistics in a variety of settings.
Term Offered: Spring, Fall
RESM 6960 Master's Thesis In Educational Research
[1-3 credit hours (0, 0, 0-3)]
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 6980 Master's Project In Educational Research
[1-3 credit hours (0, 0, 0-3)]
This is a formal independent project applying principles of research and/or measurement to solve a particular problem and culminating in a written discourse.
RESM 6990 Master's Independent Study In Educational Research
[1-3 credit hours (0, 0, 0-3)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 3)]
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 or RESM 5210 or RESM 7210
Term Offered: Summer
RESM 7310 Educational Research
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 7950 Workshop In Research And Measurement
[3 credit hours (0, 0, 3)]
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 or RESM 5110
Term Offered: Summer

RESM 7980 Special Topics In Research, Measurement, Statistics And Evaluation
[3 credit hours (0, 0, 3)]
The study of a current topic or set of related topics in educational research, measurement, statistics, program evaluation and computer applications in quantitative and qualitative data analysis. The course is typically taught as a seminar.
Prerequisites: RESM 4100 or RESM 5110
Term Offered: Spring, Summer

RESM 8120 Quantitative Methods II
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Summer

RESM 8130 Multivariate Statistics
[3 credit hours (3, 0, 0)]
This course covers multivariate analysis of variance, canonical correlation, discriminant analysis, repeated measures and factor analysis. Computer applications are included.
Prerequisites: RESM 6120 or RESM 8120
Term Offered: Fall

RESM 8140 Advanced Quantitative Methods
[3 credit hours (3, 0, 0)]
This course exposes students to various experimental designs, such as complete and fractional factorial designs, repeated measures designs, and nested designs. Both the conceptual rationale and the computational procedures are covered.
Prerequisites: RESM 6120 or RESM 8120

RESM 8150 Structural Equation Modeling
[3 credit hours (3, 0, 0)]
This course introduces structural equation modeling as a statistical method to assess the strengths of a priori relations among variables. Topics include path analysis and confirmatory factor analysis. Computer applications with AMOS are included.
Prerequisites: (RESM 6120 or RESM 8120) and RESM 5110
Term Offered: Spring

RESM 8160 Nonparametric Statistics
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Fall

RESM 8180 Interdisciplinary Seminar In Educational Psychology, Research, And Social Foundations
[1 credit hour (0, 0, 1)]
This proseminar will enable doctoral students to improve their understanding of the research process. Students will learn to ask research questions, choose alternative methodologies and interpret the validity of conclusions.

RESM 8220 Measurement I
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Fall

RESM 8230 Measurement II
[3 credit hours (3, 0, 0)]
This course covers advanced measurement-related topics with a focus on IRT with emphasis on 1-, 2- and 3-parameter logistic models, Generalizability, test equating, scaling, item/test bias detection methods and current issues.
Prerequisites: (RESM 6220 or RESM 8220) and RESM 5110

RESM 8230 Research Design
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Summer, Fall

RESM 8320 Qualitative Research II: Design And Analysis
[3 credit hours (3, 0, 0)]
This course contextualizes survey development within a broad theoretical framework and proceeds through the literature, problem, purpose, methods, and sampling. Particular emphasis is placed on the validity implications of each.
Prerequisites: RESM 8120
Term Offered: Fall
RESM 8360 Program Evaluation
[3 credit hours (3, 0, 0)]
An overview of prominent human services program evaluation methods including objectives-based, experimental, statistical and economic approaches. Evaluation criteria, issues, ethics and politics are included.
Prerequisites: RESM 4100 or RESM 5110
Term Offered: Spring, Fall

RESM 8370 Fundamentals Of Grant Writing
[3 credit hours (3, 0, 0)]
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: Summer

RESM 8380 Methods of Normative Theory Construction
[3 credit hours (0, 0, 3)]
This course explores prominent methods and approaches to normative theory construction. The two approaches covered deontological and teleological.
Term Offered: Spring, Fall

RESM 8390 Methods of Conceptual Analysis and Textual Interpretation
[3 credit hours (0, 0, 3)]
This course explores prominent methods and approaches to Central Analysis and Textual Interpretation. The central goal of the course is to equip doctoral students to engage in theoretical research, the understanding and skill necessary to engage in theoretical research.
Term Offered: Spring, Summer, Fall

RESM 8940 Internships In Measurement, Evaluation, Research & Statistics
[3 credit hours (0, 0, 8)]
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 (0, 0, 0-3)]
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 (0, 0, 0-3)]
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

TSOC 5100 Group Processes In Education
[3 credit hours (3, 0, 0)]
Examines intrapersonal and interpersonal principles of high performing teams, meaningful relationships, and being an effective leader and member of groups. Real-life projects will be designed, implemented and evaluated.
Term Offered: Spring, Summer, Fall

TSOC 5110 Modern Educational Controversies
[3 credit hours (3, 0, 0)]
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 5190 Summer Institute On Diversity In Education
[3 credit hours (0, 0, 3)]
School personnel collaborate with persons from higher education, the community, and scholars who have created model multicultural/urban education programs to learn new ways of teaching and learning among diverse populations.

TSOC 5200 Sociological Foundations Of Education
[3 credit hours (3, 0, 0)]
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 Multicultural Non-Sexist Education
[3 credit hours (3, 0, 0)]
Examines how race, class, gender, ethnicity and disability intersect with power, culture, knowledge and ideology in American schools to influence the lives of students and teachers in a multicultural society.
Term Offered: Spring, Summer, Fall

TSOC 5230 Intergroup And Intercultural Education
[3 credit hours (3, 0, 0)]
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, Summer, Fall

TSOC 5300 Philosophy And Education
[3 credit hours (3, 0, 0)]
Exploring the nature of philosophic inquiry in education and examining competing traditions in the West, particularly in the United States. A distinction between education and schooling will be drawn.
Term Offered: Spring, Summer, Fall

TSOC 5400 History Of Schooling & Teaching In The U.s.
[3 credit hours (3, 0, 0)]
Evolving role of schooling and teaching in the US, using history to reflect on the relationship of schooling to other social institutions, groups of people and the process of social change.
Term Offered: Fall

TSOC 5500 Anthropology and Education
[3 credit hours (3, 0, 0)]
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 Pedagogy  
[3 credit hours (0, 0, 3)]  
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 5950 Workshop In Educational Theory And Social Foundations  
[3 credit hours (0, 0, 3)]  
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.  
Term Offered: Spring  

TSOC 6000 Women, Culture And Pedagogy  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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 History Of Socio-Political Issues In School-state Relations  
[3 credit hours (3, 0, 0)]  
An examination of the historical, legal, sociological interaction between state and schooling in US, emphasizing both religious/non-religious issues. These concerns are compared and analyzed with respect to other countries.  
Prerequisites: TSOC 5200 or TSOC 5400 or TSOC 7200 or TSOC 7400  

TSOC 6190 Seminar In Educational Theory/Social Foundations  
[3 credit hours (0, 0, 3)]  
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 6220 Problems And Issues In Multicultural Education  
[3 credit hours (3, 0, 0)]  
Application of theoretical assumptions presented in TSOC 5210/7210 to US schools and classrooms, with particular attention given to program and curriculum issues, teachers and teaching policies, practices and procedures.  
Prerequisites: TSOC 5210 or TSOC 7210  

TSOC 6240 Sociological Analyses Of Urban Education  
[3 credit hours (3, 0, 0)]  
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 or TSOC 5210 or TSOC 7200 or TSOC 7210  
Term Offered: Spring  

TSOC 6301 Major Educational Theorists  
[3 credit hours (3, 0, 0)]  
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.  

TSOC 6320 Education And The Democratic Ethic  
[3 credit hours (3, 0, 0)]  
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 or TSOC 5300 or TSOC 5400 or TSOC 7200 or TSOC 7300 or TSOC 7400  
Term Offered: Fall  

TSOC 6330 THE ETHICS OF WAR AND PEACE AND EDUCATION  
[3 credit hours (0, 0, 3)]  
The purpose of this seminar is to explore the ethics of war and peace and its implications for the moral and civic education of democratic citizens.  
Term Offered: Spring  

TSOC 6340 Human Rights Education  
[3 credit hours (0, 0, 3)]  
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 (0, 0, 3)]  
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 (0, 0, 3)]  
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 6960 Master's Thesis In Educational Theory And Social Foundations  
[1-3 credit hours (0, 0, 0-3)]  
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 (0, 0, 0-3)]  
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 (0, 0, 0-3)]
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 Group Processes In Education
[3 credit hours (3, 0, 0)]
Examines intrapersonal and interpersonal principles of high performing teams, meaningful relationships, and being an effective leader and member of groups. Real-life projects will be designed, implemented and evaluated.
Term Offered: Spring, Summer, Fall

TSOC 7110 Modern Educational Controversies
[3 credit hours (3, 0, 0)]
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 7190 Summer Institute On Diversity In Education
[3 credit hours (0, 0, 3)]
School personnel collaborate with persons from higher education, the community, and scholars who have created model multicultural/urban education programs to learn new ways of teaching and learning among diverse populations.

TSOC 7200 Sociological Foundations Of Education
[3 credit hours (3, 0, 0)]
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 Multicultural Non-Sexist Education
[3 credit hours (3, 0, 0)]
Examines how race, class, gender, ethnicity, and disability intersect with power, culture, knowledge and ideology in American schools to influence the lives of students and teachers in a multicultural society.
Term Offered: Spring, Summer, Fall

TSOC 7230 Intergroup And Intercultural Education
[3 credit hours (3, 0, 0)]
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, Summer, Fall

TSOC 7300 Philosophy And Education
[3 credit hours (3, 0, 0)]
Exploring the nature of philosophic inquiry in education and examining competing traditions in the West, particularly in the United States. A distinction between education and schooling will be drawn.
Term Offered: Summer, Fall

TSOC 7400 History Of Schooling & Teaching In The U.s.
[3 credit hours (3, 0, 0)]
Evolving role of schooling and teaching in the US, using history to reflect on the relationship of schooling to other social institutions, groups of people and the process of social change.
Term Offered: Fall

TSOC 7500 Anthropology and Education
[3 credit hours (0, 0, 3)]
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 Pedagogy
[3 credit hours (0, 0, 3)]
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 areas of peace education.
Term Offered: Summer, Fall

TSOC 7950 Workshop In Educational Theory And Social Foundations
[3 credit hours (0, 0, 3)]
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.

TSOC 8000 Women, Culture, And Pedagogy
[3 credit hours (3, 0, 0)]
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 8120 International Education
[3 credit hours (3, 0, 0)]
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 History Of Socio-Political Issues In School-state Relations
[3 credit hours (3, 0, 0)]
An examination of the historical, legal, sociological interaction between state and schooling in US, emphasizing both religious/non-religious issues. These concerns are compared and analyzed with respect to other countries.
Prerequisites: TSOC 5200 or TSOC 5400 or TSOC 7200 or TSOC 7400

TSOC 8150 CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT
[3 credit hours (0, 0, 3)]
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 8180 Interdisciplinary Seminar In Educational Psychology, Research, And Social Foundations
[1 credit hour (0, 0, 1)]
The proseminar will enable doctoral students to improve their understanding of the research process. Students will learn to ask research questions, choose alternative methodologies and interpret the validity of conclusions.

Term Offered: Spring, Fall

TSOC 8190 Seminar In Educational Theory/Social Foundations
[3 credit hours (0, 0, 3)]
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 8220 Problems And Issues In Multicultural Education
[3 credit hours (3, 0, 0)]
2Application of theoretical assumptions presented in TSOC 5210/7210 to US schools and classrooms, with particular attention given to program and curriculum issues, teachers and teaching policies, practices and procedures.

Prerequisites: TSOC 5210 or TSOC 7210

TSOC 8240 Sociological Analyses Of Urban Education
[3 credit hours (3, 0, 0)]
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 or TSOC 5210 or TSOC 7200 or TSOC 7210

Term Offered: Spring, Summer

TSOC 8310 Major Educational Theorists
[3 credit hours (3, 0, 0)]
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

TSOC 8320 Education And The Democratic Ethic
[3 credit hours (3, 0, 0)]
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 or TSOC 5300 or TSOC 5400 or TSOC 7200 or TSOC 7300 or TSOC 7400

Term Offered: Fall

TSOC 8330 THE ETHICS OF WAR AND PEACE AND EDUCATION
[3 credit hours (0, 0, 3)]
The purpose of this seminar is to explore the ethics of war and peace and its implications for the moral and civic education of democratic citizens.

Term Offered: Spring

TSOC 8340 Human Rights Education
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 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 (0, 0, 3)]
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 (0, 0, 0-6)]
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 (0, 0, 0-6)]
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
Culture and Change in Institutions Graduate Certificate Program

The Culture and Change in Institutions Graduate Certificate program is designed for local professionals working in a variety of educational environments, including health and social service organizations, P-12 schools, community colleges, universities, and non-governmental organizations. The program requires completion of four (12 semester hours) of graduate courses. Some courses are offered online, but most courses are face-to-face to facilitate development of local network and community of learners. The twelve credit hours earned in the certificate program may be applied toward the Master’s programs in Educational Theory and Social Foundations (ETSF) or the Doctoral degree in Educational Foundations (FOED, FEPE, FEHE, FEES); however, an admissions application to these programs must occur separately. To be applied toward the doctoral degree the certificate courses must be taken at the doctoral (7000 or 8000) level.

This certificate provides students with the concepts, skills, and values to recognize and use culture more effectively in their professional practices as agents in institutional settings. Courses in the certificate program foster awareness and understanding of culture and power, and also deliver practical strategies and techniques for individuals working in institutional settings to contribute to dynamic institutional culture that extends access and privilege to individuals from all cultural backgrounds and supports enactment of our national democratic values. The Certificate in Culture and Change in Institutions aligns with Standards for Academic and Professional Instruction in Foundations of Education, Educational Studies, and Educational Policy Studies.

The application process for the Certificate Program is entirely completed online. The following are minimum application requirements for admission consideration to the Culture and Change in Institutions Graduate Certificate. The University of Toledo application requirements and other relevant information are available on the Graduate Studies website.

Admissions Criteria

Candidates admitted to the program must have the following:

- A baccalaureate degree from an accredited four-year institution.
- An overall grade point average (GPA) of at least 2.7 or higher on a 4.0 scale in all undergraduate work.
- Two recommendation letters, which may come from such sources as the undergraduate major adviser, current employer, religious or other organization leader, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A statement describing the prospective graduate student’s background and goals as well as the importance of the degree in achieving those goals.
- The program has selective admissions and may admit a limited number of graduate students. Thus, meeting all formal criteria does not guarantee admission.
- All graduate degree-seeking applicants must apply for admission to the Certificate program prior to graduation.

To earn the certificate, students are required to complete 12 semester hours of required course work from the following choices. Courses are regularly scheduled, including summer distance learning versions of some, to enable students to complete the certificate in four consecutive semesters, taking one course per semester, or two consecutive semesters, taking two courses per semester, and courses may be taken in any order:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSOC</td>
<td>Group Processes In Education</td>
<td>12</td>
</tr>
<tr>
<td>5100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSOC</td>
<td>Multicultural Non-Sexist Education</td>
<td></td>
</tr>
<tr>
<td>5210</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7210</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSOC</td>
<td>Intergroup And Intercultural Education</td>
<td></td>
</tr>
<tr>
<td>5230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDP</td>
<td>CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>6150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSOC</td>
<td>Education And The Democratic Ethic</td>
<td></td>
</tr>
<tr>
<td>6320</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8320</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

DE in Educational Administration and Supervision

Admission to Doctoral Programs

Individuals applying for admission to doctoral study in the Judith Herb College of Education must meet the admission requirements of the College of Graduate Studies, the Judith Herb College of Education, and the specific degree program the individual chooses. The following is a composite of the College of Graduate Studies and the Judith Herb College of Education.

- A minimum 3.25 cumulative GPA, using a 4.0 scale, on all previous graduate academic work and completed master’s degree from an accredited institution.
- Acceptable GRE scores, as determined by individual programs.

Recommended GRE scores for admission into the designated doctoral programs:

<table>
<thead>
<tr>
<th>Program</th>
<th>Verbal</th>
<th>Quantitative</th>
<th>Analytic Writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Administration and Supervision</td>
<td>152</td>
<td>146</td>
<td>4.0</td>
</tr>
<tr>
<td>(Ed.D.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research and Measurement</td>
<td>152</td>
<td>146</td>
<td>4.0</td>
</tr>
<tr>
<td>Educational Psychology</td>
<td>GRE not required; interview possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philosophy of Education</td>
<td>GRE not required; interview possible</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A professional interview upon the completion of the written application may be required by the following programs:

- Educational Administration and Supervision,
- Educational Psychology,
- Philosophy of Education,
- Educational Sociology,
- History of Education, and
- Foundations of Education.

Requirements for Doctoral Programs

A minimum of 61 hours beyond the master’s degree is required. Each doctoral student is expected to:

- Successfully complete 6 hours in a foundations core (Educational Psychology, Theory and Social Foundation);
- Concentrate in one area of specialization (i.e., a major) and pass a written examination (major examination) in the major area of concentration;
- Demonstrate proficiency in tools of research, successfully completing 9-12 hours of coursework in Research Tools;
- Depending on program, successfully complete 9 hours in minor program outside of major and pass a separate written examination for any minor area of concentration;
- After passing the written major examination and any written minor examination, pass an oral examination that covers the relevant coursework;
- Orally present and defend a dissertation proposal in a public forum;
- Orally present and defend a completed dissertation in a public forum.

Academic Advising Committee

The student is assigned an initial advisor upon admission to a program. This advisor guides the student in forming a doctoral program committee.

The doctoral program committee shall be formed before the student completes 18 hours of credit. 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 doctoral major exam, any minor exam(s), and the doctoral program oral.

The plan of study must be approved by the doctoral program committee, the department chairperson, and the Associate Dean of the college. The plan of study must be filed before 18 semester hours of the doctoral program are completed. After completion of the academic requirements, the student must form a dissertation committee to guide the development of the dissertation.

Dissertation

The dissertation committee must include a minimum of four graduate faculty members, including one who is not in the discipline major. Members of the dissertation committee may also have been members of the doctoral program committee. The student must work closely with the committee to develop a research proposal for the dissertation. Once the committee approves the research design, the student must obtain Institutional Research Board approval before beginning the research study. A public, oral defense of the dissertation proposal and the completed dissertation is required.

EdS in Administration and Supervision

The educational specialist (Ed.S.) degree is a post-master’s graduate program in administration and supervision that provides students an area of organizational leadership or educational specialization with emphasis on practice. This 36 hour degree is designed to meet the needs of individuals whose career goals include licensure for advanced administrative positions in public and private schools (e.g., district administrator, building administrator).

Admission requirements to the EdS. program includes:

- A bachelor’s degree from an accredited four-year institution and a master’s degree from an accredited institution.
- A minimum 3.25 cumulative GPA, using a 4.0 scale, on all previous graduate academic work.
- Three letters of recommendation from academic professionals regarding the applicant’s character and potential for doing post-master’s level work. A statement of purpose demonstrating writing ability and the applicant’s goals, and how the educational specialist degree supports those goals.
- Completion of a minimum of 36 semester hours of approved graduate coursework beyond the master’s level (7000/8000 level courses) with a minimum GPA of 3.0 on a 4.0 scale. All course work for the Ed.S.
must be completed within a six-year period immediately preceding the date the degree is awarded.

- Students are required to develop a plan of study with their advisor that specifies the coursework that must be completed to fulfill degree requirements including EDAS 8640 and EDAS 7920. This plan must be filed prior to the completion of 15 semester hours and must be approved by the advisor, the department chairperson, and the college associate dean.
- No more than a total of six semester hours of credit from workshops (7950), problems or special topics courses (7980) and independent studies (7990 or 8990) may be applied to a specialist's program.
- The program requires the completion of a culminating experience, which may include field experiences, internships, projects, etc.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. EDAS core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDAS 8640</td>
<td>Leading Systems Change</td>
<td>3</td>
</tr>
<tr>
<td>B. Major</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>C. Culminating Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDAS 7920</td>
<td>Specialist Project In Educational Administration</td>
<td>1-3</td>
</tr>
</tbody>
</table>

1 Courses must be pre-approved by the faculty advisor.

**Educational Assessment Specialist Certificate**

The Educational Assessment Specialist certificate may be earned by students from any major and is intended to assist teachers, principals and superintendents to obtain the education needed to meet the challenges of the modern school and promote student learning. Students will acquire skills necessary to meet the data-informed decision making and accountability challenges demanded in the current educational environment.

Three fully online, three credit hour, courses are required in addition to a hands-on practicum at the student's location. The practicum is guided by University research and measurement faculty. Minimum number of credit hours for completion is 12.

The certificate may be added to a degree or completed independently.

- Application
- Transcripts
- 3 Letters of recommendation
- Statement of purpose

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESM 5210</td>
<td>Educational Testing And Grading</td>
<td>3</td>
</tr>
<tr>
<td>RESM 5310</td>
<td>Educational Research</td>
<td>3</td>
</tr>
<tr>
<td>RESM 5110</td>
<td>Quantitative Methods I</td>
<td>3</td>
</tr>
<tr>
<td>RESM 6940</td>
<td>Internships In Measurement, Evaluation, Research &amp; Statistics</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours 12

**Foundations of Peace Education Certificate Program**

The Online Foundations of Peace Education Graduate Certificate program is designed for educational professionals working in a variety of educational environments, ranging from P-12 schools, community colleges, universities, and non-governmental organizations. The program requires completion of four (12 semester hours) of graduate courses. All courses are offered online. The twelve credit hours earned in the certificate program may be applied toward the Master's programs in Educational Psychology (FEEP) or Educational Theory and Social Foundations (ETSF, FOED, FEPE, FEES) or the Doctoral degree in Educational Foundations; however, an admissions application to these programs must occur separately. To be applied toward the doctoral degree the certificate courses must be taken at the doctoral (7000 or 8000) level. This certificate will provide students with the concepts, skills, and values to infuse peace education throughout the curriculum, thereby providing them with greater opportunities to be hired in a variety of educational settings.

The application process for the Certificate Program is entirely completed online. The following are minimum application requirements for admission consideration to the Certificate Program in Foundations of Peace Education. The University of Toledo application requirements and other relevant information are available on the Graduate Studies website.

**Admissions Criteria**

Candidates admitted to the program must have the following:

- A baccalaureate degree from an accredited four-year institution. However, if you are planning to teach in P-12 schools, you must have a teaching license in a specific subject area or discipline.
- An overall grade point average (GPA) of at least 2.7 or higher on a 4.0 scale in all undergraduate work.
- Two recommendation letters, which may come from such sources as the undergraduate major adviser, current employer, school principal or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A statement describing the prospective graduate student’s background and goals as well as the importance of the degree in achieving those goals.
- The program has selective admissions and may admit a limited number of graduate students. Thus, meeting all formal criteria does not guarantee admission.
- All graduate degree-seeking applicants must apply for admission to the Certificate program prior to graduation.

Complete 12 semester hours of required course work.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSOC 5600/7600</td>
<td>Foundations of Peace Pedagogy</td>
<td>3</td>
</tr>
</tbody>
</table>

**Additional Courses**

Select three of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSOC 6190/8190</td>
<td>Seminar In Educational Theory/Social Foundations</td>
<td>9</td>
</tr>
</tbody>
</table>
Higher Education Administration Certificate

A 12-credit hour Certificate Program in Higher Education Administration that presents course choices in two areas – institutional administration and learning environments.

- A baccalaureate degree granted by an accredited institution, with a minimum GPA of 2.7. Current graduate students must be in good academic standing, with a GPA of 3.0 or above
- Official transcripts
- A statement of purpose discussing the applicant’s interest in the Certificate Program
- A current resume

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HED 6640</td>
<td>Governance And Administration In Higher Education</td>
<td>6</td>
</tr>
<tr>
<td>HED 6730</td>
<td>Legal Aspects Of Higher Education</td>
<td></td>
</tr>
<tr>
<td>HED 6700</td>
<td>Finance Of Higher Education</td>
<td></td>
</tr>
<tr>
<td>HED 6790</td>
<td>Managing College And University Personnel</td>
<td></td>
</tr>
<tr>
<td>HED 6530</td>
<td>Theories Of Student Development</td>
<td>6</td>
</tr>
<tr>
<td>HED 6010</td>
<td>History Of Higher Education</td>
<td></td>
</tr>
</tbody>
</table>

ME in Educational Administration and Supervision

Admission to Master’s Degree Programs

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the Department of Educational Foundations and Leadership (EDFL) require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
- Three letters of recommendation regarding the prospective graduate student's potential for doing master's level work, which, depending upon the student’s status at the time, may come from such sources as the undergraduate major advisor, current employer, school principal, or others who are knowledgeable about the applicant's ability to engage in graduate work in the desired program.
- A statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

Requirements for Master’s Degree Programs

Master’s programs housed in the Department of Educational Foundations and leadership require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. No more than a total of six semester hours of credit from workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

- A plan of study identifying the courses for the master’s degree is required after 12 credit hours, generally at the end of the first semester of full time study.
- All students completing one of the master's degrees in this department must fulfill core requirements by completing one course from each of the four foundations core areas (Curriculum and Instruction, Theory and Social Foundation, Educational Psychology, & Research and measurement) within the first 18 semester hours of course work (four of the first six courses must be core courses).
- All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.
- The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.
Programs leading to licensure or endorsement may require additional semester hours to fulfill licensure credentials as well as degree requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Foundations Core</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Psychological Foundations</strong></td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>EDP 5110</td>
<td>Basic Educational Psychology</td>
<td></td>
</tr>
<tr>
<td>EDP 5120</td>
<td>Alternative Approaches To Discipline</td>
<td></td>
</tr>
<tr>
<td>EDP 5210</td>
<td>Child Behavior And Development</td>
<td></td>
</tr>
<tr>
<td>EDP 5220</td>
<td>Adolescent Behavior And Development</td>
<td></td>
</tr>
<tr>
<td>EDP 5230</td>
<td>Adult Development</td>
<td></td>
</tr>
<tr>
<td>EDP 5320</td>
<td>Instructional Psychology</td>
<td></td>
</tr>
<tr>
<td>EDP 5330</td>
<td>Behavior Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Research Foundations</strong></td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESM 5110</td>
<td>Quantitative Methods I</td>
<td></td>
</tr>
<tr>
<td>RESM 5210</td>
<td>Educational Testing And Grading</td>
<td></td>
</tr>
<tr>
<td>RESM 5310</td>
<td>Educational Research</td>
<td></td>
</tr>
<tr>
<td>RESM 5330</td>
<td>Qualitative Research I: Introduction And Basic Methods</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Social Foundations</strong></td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSOC 5100</td>
<td>Group Processes In Education</td>
<td></td>
</tr>
<tr>
<td>TSOC 5110</td>
<td>Modern Educational Controversies</td>
<td></td>
</tr>
<tr>
<td>TSOC 5200</td>
<td>Sociological Foundations Of Education</td>
<td></td>
</tr>
<tr>
<td>TSOC 5210</td>
<td>Multicultural Non-Sexist Education</td>
<td></td>
</tr>
<tr>
<td>TSOC 5230</td>
<td>Intergroup And Intercultural Education</td>
<td></td>
</tr>
<tr>
<td>TSOC 5300</td>
<td>Philosophy And Education</td>
<td></td>
</tr>
<tr>
<td>TSOC 5400</td>
<td>History Of Schooling &amp; Teaching In The U.s.</td>
<td></td>
</tr>
<tr>
<td>TSOC 5500</td>
<td>Anthropology and Education</td>
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<tr>
<td></td>
<td><strong>Curriculum</strong></td>
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<tr>
<td>Select one of the following:</td>
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<td></td>
</tr>
<tr>
<td>CI 6840</td>
<td>Curriculum For Educational Leaders (recommended)</td>
<td></td>
</tr>
<tr>
<td>CI 5870</td>
<td>Secondary School Curriculum</td>
<td></td>
</tr>
<tr>
<td>CI 6800</td>
<td>Foundations Of Curriculum &amp; Instruction</td>
<td></td>
</tr>
<tr>
<td>CI 6810</td>
<td>Curriculum Development: K-12</td>
<td></td>
</tr>
<tr>
<td>CI 6830</td>
<td>Curriculum Trends And Issues</td>
<td></td>
</tr>
<tr>
<td>ETPT 5100</td>
<td>Instructional Systems Design Principles (pre-approved by adviser)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Specialization</strong></td>
<td>15</td>
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<tr>
<td>Select five of the following:</td>
<td></td>
<td></td>
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<tr>
<td>EDAS 6000</td>
<td>The Individual In Organizations</td>
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<tr>
<td>EDAS 6020</td>
<td>Instructional Leadership and Supervision</td>
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<tr>
<td>EDAS 6110</td>
<td>Legal Aspects Of School Administration</td>
<td></td>
</tr>
<tr>
<td>EDAS 6230</td>
<td>Community And Schools</td>
<td></td>
</tr>
<tr>
<td>EDAS 6150</td>
<td>The Administrative Experience</td>
<td></td>
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<tr>
<td>or others with pre-approval</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Seminar, Project, or Thesis</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours:** 30

1 Courses must be pre-approved by the faculty advisor.

Programs leading to the M.Ed. degree in educational administration and supervision also may meet some of the requirements for a principal license in Ohio. Students should consult their advisor for detailed information.

**Licensure Programs**
- Principal (PreK-6)
- Principal (4-9)
- Principal (5-12)
- Superintendent

**ME in Educational Psychology Admission to Master’s Degree Programs**

In addition to the College of Graduate Studies admission requirements, master's programs housed in the Department of Educational Foundations and Leadership (EDFL) require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
- Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which, depending upon the student’s status at the time, may come from such sources as the undergraduate major advisor, current employer, school principal, or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
- A statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

**Requirements for Master’s Degree Programs**

Master’s programs housed in the Department of Educational Foundations and leadership require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. No more than a total of six semester hours of credit from workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.
• A plan of study identifying the courses for the master’s degree is required after 12 credit hours, generally at the end of the first semester of full time study.
• All students completing one of the master’s degrees in this department must fulfill core requirements by completing one course from each of the four foundations core areas (Curriculum and Instruction, Theory and Social Foundation, Educational Psychology, & Research and measurement) within the first 18 semester hours of course work (four of the first six courses must be core courses).
• All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.
• The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill licensure credentials as well as degree requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Code Title</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Foundations Core</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Psychological Foundations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td>3</td>
</tr>
<tr>
<td>EDP 5110</td>
<td>Basic Educational Psychology</td>
<td></td>
</tr>
<tr>
<td>EDP 5120</td>
<td>Alternative Approaches To Discipline</td>
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<tr>
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<td>Child Behavior And Development</td>
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<td>EDP 5320</td>
<td>Instructional Psychology</td>
<td></td>
</tr>
<tr>
<td>EDP 5330</td>
<td>Behavior Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research Foundations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td>3</td>
</tr>
<tr>
<td>REM 5110</td>
<td>Quantitative Methods I</td>
<td></td>
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<tr>
<td>REM 5210</td>
<td>Educational Testing And Grading</td>
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</tr>
<tr>
<td>REM 5310</td>
<td>Educational Research</td>
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<tr>
<td>REM 5330</td>
<td>Qualitative Research I: Introduction And Basic Methods</td>
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</tr>
<tr>
<td></td>
<td>Social Foundations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td>3</td>
</tr>
<tr>
<td>TSOE 5100</td>
<td>Group Processes In Education</td>
<td></td>
</tr>
<tr>
<td>TSOE 5110</td>
<td>Modern Educational Controversies</td>
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<tr>
<td>TSOE 5200</td>
<td>Sociological Foundations Of Education</td>
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<tr>
<td>TSOE 5210</td>
<td>Multicultural Non-Sexist Education</td>
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</tr>
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<td>TSOE 5230</td>
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<td>TSOE 5300</td>
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<td>History Of Schooling &amp; Teaching In The U.s.</td>
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<tr>
<td>or EDP 6980</td>
<td>Master’s Project In Educational Psychology</td>
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</tr>
<tr>
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<td>Total Hours</td>
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</tbody>
</table>

^1 Courses must be pre-approved by the faculty advisor.

**ME in Educational Research and Measurement**

**Admission to Master’s Degree Programs**

In addition to the College of Graduate Studies admission requirements, master’s programs housed in the Department of Educational Foundations and Leadership (EDFL) require the following:

• An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
• Three letters of recommendation regarding the prospective graduate student’s potential for doing master’s level work, which, depending upon the student’s status at the time, may come from such sources as the undergraduate major advisor, current employer, school principal, or others who are knowledgeable about the applicant’s ability to engage in graduate work in the desired program.
• A statement describing the student’s background and goals as well as the importance of the degree in achieving those goals.

Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

**Requirements for Master’s Degree Programs**

Master’s programs housed in the Department of Educational Foundations and leadership require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. No more than a total of six semester hours of credit from workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

• A plan of study identifying the courses for the master’s degree is required after 12 credit hours, generally at the end of the first semester of full time study.
• All students completing one of the master’s degrees in this department must fulfill core requirements by completing one course...
from each of the four foundations core areas (Curriculum and Instruction, Theory and Social Foundation, Educational Psychology, & Research and measurement) within the first 18 semester hours of course work (four of the first six courses must be core courses).

- All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.
- The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill licensure credentials as well as degree requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<td></td>
<td><strong>Foundations Core</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Psychological Foundations</strong></td>
<td></td>
</tr>
<tr>
<td></td>
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<td>EDP 5110</td>
<td>Basic Educational Psychology</td>
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<td>EDP 5120</td>
<td>Alternative Approaches To Discipline</td>
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<td>Adolescent Behavior And Development</td>
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<td>Adult Development</td>
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<td>Instructional Psychology</td>
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<td>EDP 5330</td>
<td>Behavior Management</td>
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<td>RESM 5210</td>
<td>Educational Testing And Grading</td>
<td></td>
</tr>
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<td>RESM 5310</td>
<td>Educational Research</td>
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<td>RESM 5330</td>
<td>Qualitative Research I: Introduction And Basic Methods</td>
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</tr>
<tr>
<td></td>
<td><strong>Social Foundations</strong></td>
<td></td>
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<td></td>
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<td>TSOC 5100</td>
<td>Group Processes In Education</td>
<td></td>
</tr>
<tr>
<td>TSOC 5110</td>
<td>Modern Educational Controverses</td>
<td></td>
</tr>
<tr>
<td>TSOC 5200</td>
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<td>TSOC 5210</td>
<td>Multicultural Non-Sexist Education</td>
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<td>Intergroup And Intercultural Education</td>
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<td></td>
</tr>
<tr>
<td>TSOC 5400</td>
<td>History Of Schooling &amp; Teaching In The U.s.</td>
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<tr>
<td>TSOC 5500</td>
<td>Anthropology and Education</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Curriculum</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td>3</td>
</tr>
<tr>
<td>CI 5870</td>
<td>Secondary School Curriculum</td>
<td></td>
</tr>
<tr>
<td>CI 6810</td>
<td>Curriculum Development: K-12</td>
<td></td>
</tr>
<tr>
<td>CI 6830</td>
<td>Curriculum Trends And Issues</td>
<td></td>
</tr>
<tr>
<td>CI 6840</td>
<td>Curriculum For Educational Leaders</td>
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</tr>
<tr>
<td>ETPT 5100</td>
<td>Instructional Systems Design Principles</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Specialization</strong></td>
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<td>Select 21 credits. Areas of focus may include:</td>
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<td>statistics</td>
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<tr>
<td>or RESM 6980 Master’s Project In Educational Research</td>
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Total Hours 36

1 Courses must be pre-approved by the faculty advisor.

**ME in Educational Theory and Social Foundations**

**Admission to Master's Degree Programs**

In addition to the College of Graduate Studies admission requirements, master's programs housed in the Department of Educational Foundations and Leadership (EDFL) require the following:

- An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for provisional admission, provided they demonstrate excellent promise for graduate study. The GRE is required for students with less than a 2.7 undergraduate grade point average.
- Three letters of recommendation regarding the prospective graduate student's potential for doing master's level work, which, depending upon the student's status at the time, may come from such sources as the undergraduate major advisor, current employer, school principal, or others who are knowledgeable about the applicant's ability to engage in graduate work in the desired program.
- A statement describing the student's background and goals as well as the importance of the degree in achieving those goals.
- Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

**Requirements for Master’s Degree Programs**

Master's programs housed in the Department of Educational Foundations and leadership require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work. No more than a total of six semester hours of credit from workshops (5950), problems or special topics courses (5980 or 6980), and independent studies (5990 or 6990) may be included in the degree program.

- A plan of study identifying the courses for the master’s degree is required after 12 credit hours, generally at the end of the first semester of full time study.
- All students completing one of the master's degrees in this department must fulfill core requirements by completing one course from each of the four foundations core areas (Curriculum and Instruction, Theory and Social Foundation, Educational Psychology, & Research and measurement) within the first 18 semester hours of course work (four of the first six courses must be core courses).
• All course work for the master’s degree must be taken within a six-year period immediately preceding the date the degree is awarded.
• The completion of a thesis, project, comprehensive examination, seminar, or field experience (practicum) is noted in specific program descriptions.

Programs leading to licensure or endorsement may require additional semester hours to fulfill licensure credentials as well as degree requirements.

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<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<td></td>
<td><strong>Foundations Core</strong></td>
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<td></td>
<td><strong>Psychological Foundations</strong></td>
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<td>Select one of the following:</td>
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<td>EDP 5110</td>
<td>Basic Educational Psychology</td>
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<td>Alternative Approaches To Discipline</td>
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<td>EDP 5210</td>
<td>Child Behavior And Development</td>
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<td>RESM 5330</td>
<td>Qualitative Research I: Introduction And Basic Methods</td>
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<td>TSOC 5300</td>
<td>Philosophy And Education</td>
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<td>CI 5870</td>
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<td>TSOC 6960</td>
<td>Master’s Thesis In Educational Theory And Social Foundations</td>
<td>3</td>
</tr>
<tr>
<td>or TSOC 6980</td>
<td>Master’s Project In Educational Theory And Social Foundations</td>
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| Total Hours | 36 |

Courses must be pre-approved by the faculty advisor.

**PhD in Foundations of Education**

**Admission to Doctoral Programs**

Individuals applying for admission to doctoral study in the Judith Herb College of Education must meet the admission requirements of the College of Graduate Studies, the Judith Herb College of Education, and the specific degree program the individual chooses. The following is a composite of the College of Graduate Studies and the Judith Herb College of Education.

• A minimum 3.25 cumulative GPA, using a 4.0 scale, on all previous graduate academic work and completed master’s degree from an accredited institution.
• Acceptable GRE scores, as determined by individual programs.

Recommended GRE scores for admission into the designated doctoral programs:

<table>
<thead>
<tr>
<th>Program</th>
<th>Verbal</th>
<th>Quantitative</th>
<th>Analytic Writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Administration and Supervision (Ed.D.)</td>
<td>152</td>
<td>146</td>
<td>4.0</td>
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<tr>
<td>Research and Measurement</td>
<td>152</td>
<td>146</td>
<td>4.0</td>
</tr>
<tr>
<td>Educational Psychology</td>
<td>GRE not required; interview possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philosophy of Education</td>
<td>GRE not required; interview possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Sociology</td>
<td>GRE not required; interview possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of Education</td>
<td>GRE not required; interview possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundations of Education</td>
<td>GRE not required; interview possible</td>
<td></td>
<td></td>
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</tbody>
</table>

• A resume or curriculum vitae.
• Three letters of recommendation detailing candidate’s potential for completing doctoral-level work.
• A statement of purpose that describes why the applicant wishes to pursue the selected doctoral program. This statement also should
include information on previous study, educational experience, professional accomplishments, immediate and future professional goals, and any other information that the applicant believes is relevant for admission into the desired program.

- Evidence of research and writing ability. Such evidence may include a master’s thesis, class paper, a written research report, one or more reprints of publications, a paper presented to a professional society, or similar evidence of competence in this respect.

- A professional interview upon the completion of the written application may be required by the following programs:
  - Educational Administration and Supervision,
  - Educational Psychology,
  - Philosophy of Education,
  - Educational Sociology,
  - History of Education, and
  - Foundations of Education.

**Requirements for Doctoral Programs**

A minimum of 61 hours beyond the master’s degree is required. Each doctoral student is expected to:

- Successfully complete 6 hours in a foundations core (Educational Psychology, Theory and Social Foundation);
- Concentrate in one area of specialization (i.e., a major) and pass a written examination (major examination) in the major area of concentration;
- Demonstrate proficiency in tools of research, successfully completing 9-12 hours of coursework in Research Tools;
- Depending on program, successfully complete 9 hours in minor program outside of major and pass a separate written examination for any minor area of concentration;
- After passing the written major examination and any written minor examination, pass an oral examination that covers the relevant coursework;
- Orally present and defend a dissertation proposal in a public forum;
- Orally present and defend a completed dissertation in a public forum.

**Academic Advising Committee**

The student is assigned an initial advisor upon admission to a program. This advisor guides the student in forming a doctoral program committee.

The doctoral program committee shall be formed before the student completes 18 hours of credit. 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 doctoral major exam, any minor exam(s), and the doctoral program oral.

The plan of study must be approved by the doctoral program committee, the department chairperson, and the Associate Dean of the college. The plan of study must be filed before 18 semester hours of the doctoral program are completed. After completion of the academic requirements, the student must form a dissertation committee to guide the development of the dissertation.

**Dissertation**

The dissertation committee must include a minimum of four graduate faculty members, including one who is not in the discipline major. Members of the dissertation committee may also have been members of the doctoral program committee. The student must work closely with the committee to develop a research proposal for the dissertation. Once the committee approves the research design, the student must obtain Institutional Research Board approval before beginning the research study. A public, oral defense of the dissertation proposal and the completed dissertation is required.

**PhD in Foundations of Education: Educational Psychology**

**Admission to Doctoral Programs**

Individuals applying for admission to doctoral study in the Judith Herb College of Education must meet the admission requirements of the College of Graduate Studies, the Judith Herb College of Education, and the specific degree program the individual chooses. The following is a composite of the College of Graduate Studies and the Judith Herb College of Education.

- A minimum 3.25 cumulative GPA, using a 4.0 scale, on all previous graduate academic work and completed master’s degree from an accredited institution.
- Acceptable GRE scores, as determined by individual programs.

Recommended GRE scores for admission into the designated doctoral programs:

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<th>Quantitative</th>
<th>Analytic Writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Administration and Supervision</td>
<td>152</td>
<td>146</td>
<td>4.0</td>
</tr>
<tr>
<td>Research and Measurement</td>
<td>152</td>
<td>146</td>
<td>4.0</td>
</tr>
<tr>
<td>Educational Psychology</td>
<td>GRE not required; interview possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philosophy of Education</td>
<td>GRE not required; interview possible</td>
<td></td>
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</tr>
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<td>Educational Sociology</td>
<td>GRE not required; interview possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of Education</td>
<td>GRE not required; interview possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundations of Education</td>
<td>GRE not required; interview possible</td>
<td></td>
<td></td>
</tr>
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- A resume or curriculum vitae.
- Three letters of recommendation detailing candidate’s potential for completing doctoral-level work.
• A statement of purpose that describes why the applicant wishes to pursue the selected doctoral program. This statement also should include information on previous study, educational experience, professional accomplishments, immediate and future professional goals, and any other information that the applicant believes is relevant for admission into the desired program.

• Evidence of research and writing ability. Such evidence may include a master’s thesis, class paper, a written research report, one or more reprints of publications, a paper presented to a professional society, or similar evidence of competence in this respect.

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  - Educational Sociology,
  - History of Education, and
  - Foundations of Education.

Requirements for Doctoral Programs
A minimum of 61 hours beyond the master’s degree is required. Each doctoral student is expected to:

• Successfully complete 6 hours in a foundations core (Educational Psychology, Theory and Social Foundation);
• Concentrate in one area of specialization (i.e., a major) and pass a written examination (major examination) in the major area of concentration;
• Demonstrate proficiency in tools of research, successfully completing 9-12 hours of coursework in Research Tools;
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Academic Advising Committee
The student is assigned an initial advisor upon admission to a program. This advisor guides the student in forming a doctoral program committee.

The doctoral program committee shall be formed before the student completes 18 hours of credit. 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 doctoral major exam, any minor exam(s), and the doctoral program oral.

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PhD in Foundations of Education: Educational Sociology

Admission to Doctoral Programs
Individuals applying for admission to doctoral study in the Judith Herb College of Education must meet the admission requirements of the College of Graduate Studies, the Judith Herb College of Education, and the specific degree program the individual chooses. The following is a composite of the College of Graduate Studies and the Judith Herb College of Education.

• A minimum 3.25 cumulative GPA, using a 4.0 scale, on all previous graduate academic work and completed master’s degree from an accredited institution.
• Acceptable GRE scores, as determined by individual programs.

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• A resume or curriculum vitae.
• Three letters of recommendation detailing candidate’s potential for completing doctoral-level work.
• A statement of purpose that describes why the applicant wishes to pursue the selected doctoral program. This statement also should include information on previous study, educational experience, professional accomplishments, immediate and future professional goals, and any other information that the applicant believes is relevant for admission into the desired program.
• Evidence of research and writing ability. Such evidence may include a master’s thesis, class paper, a written research report, one or more reprints of publications, a paper presented to a professional society, or similar evidence of competence in this respect.
• A professional interview upon the completion of the written application may be required by the following programs:
  • Educational Administration and Supervision,
  • Educational Psychology,
  • Philosophy of Education,
  • Educational Sociology,
  • History of Education, and
  • Foundations of Education.

Requirements for Doctoral Programs
A minimum of 61 hours beyond the master’s degree is required. Each doctoral student is expected to:

• Successfully complete 6 hours in a foundations core (Educational Psychology, Theory and Social Foundation);
• Concentrate in one area of specialization (i.e., a major) and pass a written examination (major examination) in the major area of concentration;
• Demonstrate proficiency in tools of research, successfully completing 9-12 hours of coursework in Research Tools;
• Depending on program, successfully complete 9 hours in minor program outside of major and pass a separate written examination for any minor area of concentration;
• After passing the written major examination and any written minor examination, pass an oral examination that covers the relevant coursework;
• Orally present and defend a dissertation proposal in a public forum;
• Orally present and defend a completed dissertation in a public forum.

Academic Advising Committee
The student is assigned an initial advisor upon admission to a program. This advisor guides the student in forming a doctoral program committee.

The doctoral program committee shall be formed before the student completes 18 hours of credit. 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 doctoral major exam, any minor exam(s), and the doctoral program oral.

The plan of study must be approved by the doctoral program committee, the department chairperson, and the Associate Dean of the college. The plan of study must be filed before 18 semester hours of the doctoral program are completed. After completion of the academic requirements, the student must form a dissertation committee to guide the development of the dissertation.

Dissertation
The dissertation committee must include a minimum of four graduate faculty members, including one who is not in the discipline major. Members of the dissertation committee may also have been members of the doctoral program committee. The student must work closely with the committee to develop a research proposal for the dissertation. Once the committee approves the research design, the student must obtain Institutional Research Board approval before beginning the research study. A public, oral defense of the dissertation proposal and the completed dissertation is required.

PhD in Foundations of Education: History of Education

Admission to Doctoral Programs
Individuals applying for admission to doctoral study in the Judith Herb College of Education must meet the admission requirements of the College of Graduate Studies, the Judith Herb College of Education, and the specific degree program the individual chooses. The following is a composite of the College of Graduate Studies and the Judith Herb College of Education.

• A minimum 3.25 cumulative GPA, using a 4.0 scale, on all previous graduate academic work and completed master’s degree from an accredited institution.
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PhD in Foundations of Education: Philosophy of Education

Admission to Doctoral Programs

Individuals applying for admission to doctoral study in the Judith Herb College of Education must meet the admission requirements of the College of Graduate Studies, the Judith Herb College of Education, and the specific degree program the individual chooses. The following is a composite of the College of Graduate Studies and the Judith Herb College of Education.

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History of Education
GRE not required; interview possible

Foundations of Education
GRE not required; interview possible

- A resume or curriculum vitae.
- Three letters of recommendation detailing candidate’s potential for completing doctoral-level work.
- A statement of purpose that describes why the applicant wishes to pursue the selected doctoral program. This statement also should include information on previous study, educational experience, professional accomplishments, immediate and future professional goals, and any other information that the applicant believes is relevant for admission into the desired program.
- Evidence of research and writing ability. Such evidence may include a master’s thesis, class paper, a written research report, one or more reprints of publications, a paper presented to a professional society, or similar evidence of competence in this respect.
- A professional interview upon the completion of the written application may be required by the following programs:
  - Educational Administration and Supervision,
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Requirements for Doctoral Programs
A minimum of 61 hours beyond the master’s degree is required. Each doctoral student is expected to:

- Successfully complete 6 hours in a foundations core (Educational Psychology, Theory and Social Foundation);
- Concentrate in one area of specialization (i.e., a major) and pass a written examination (major examination) in the major area of concentration;
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Dissertation
The dissertation committee must include a minimum of four graduate faculty members, including one who is not in the discipline major. Members of the dissertation committee may also have been members of the doctoral program committee. The student must work closely with the committee to develop a research proposal for the dissertation. Once the committee approves the research design, the student must obtain Institutional Research Board approval before beginning the research study. A public, oral defense of the dissertation proposal and the completed dissertation is required.

PhD in Foundations of Education: Research and Measurement

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Degrees/Certificates Offered

Requirements for Doctoral Programs
A minimum of 61 hours beyond the master’s degree is required. Each doctoral student is expected to:

- Successfully complete 6 hours in a foundations core (Educational Psychology, Theory and Social Foundation);
- Concentrate in one area of specialization (i.e., a major) and pass a written examination (major examination) in the major area of concentration;
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Degrees/Certificates Offered

Master’s Degree Programs
Curriculum & Instruction (p. 299)
- Master of Arts and Education
  - Education and economics
  - Education and English
  - English as a second language (ESL)
  - Education and French
  - Education and geography
  - Education and German
  - Education and history
  - Education and mathematics
  - Education and political science
  - Education and sociology
  - Education and Spanish
- Master of Education
  - Art education
  - Career and technical education
  - Curriculum and instruction
  - Educational technology
  - Middle childhood education (LAMP only)
• Secondary education (LAMP only)
• special education
• Master of Music in Music Education
• Master of Science and Education
  • Education and biology
  • Education and chemistry
  • Education and geology
  • Education and physics

EARLY CHILDHOOD, HIGHER EDUCATION, AND SPECIAL EDUCATION (p. 337)
• Master of Education
  • Early childhood education PreK-3
  • Higher Education
  • Special education

Educational Foundations and Leadership (p. 362)
• Master of Education
  • Educational administration and supervision
  • Educational psychology
  • Educational research and measurement
  • Educational theory and social foundations

Licensure and Master's Degrees
CURRICULUM & INSTRUCTION (p. 299)
• Adolescence and young adult (7-12)
• Art education (multi-age)
• Foreign language (multi-age)
• Middle grade (4-9)
• Music education (multi-age)

EARLY CHILDHOOD, HIGHER EDUCATION, AND SPECIAL EDUCATION (p. 337)
• Early childhood education (preK-3)
• Intervention specialist: Mild/Moderate
• Intervention specialist: Moderate/Intensive

Education Specialist Degree Programs
Educational Foundation & Leadership (p. 362)
• Education Specialist in Administration and Supervision
• Education Specialist in Curriculum and Instruction

Doctoral Degree Programs
CURRICULUM & INSTRUCTION (p. 299)
• Doctor of Philosophy in Curriculum and Instruction with concentrations in:
  • Curriculum and instruction
  • Educational media
  • Secondary education

EARLY CHILDHOOD, HIGHER EDUCATION, AND SPECIAL EDUCATION (p. 337)
• Doctor of Philosophy in Curriculum and Instruction with concentrations in:
  • Early childhood education
  • Gifted and talented
  • Special education
• Doctor of Philosophy in Higher Education

EDUCATIONAL FOUNDATIONS & LEADERSHIP (p. 362)
• Doctor of Education in Educational Administration and Supervision
• Doctor of Philosophy in Foundations of Education with concentrations in:
  • Educational psychology
    • Areas of focus may include learning & cognition of human development
  • Educational sociology
  • Foundations of education
  • History of education
  • Philosophy of education
  • Research and measurement
    • Areas of focus may include statistics, measurement, or evaluation

Endorsements
CURRICULUM & INSTRUCTION (p. 299)
• Career-based intervention
• Early childhood generalist (grades 4-5)
• Reading (preK-12)

EARLY CHILDHOOD, HIGHER EDUCATION, AND SPECIAL EDUCATION (p. 337)
• Gifted
• Pre-school special needs
• Transition to work

Certificate Programs
EARLY CHILDHOOD, HIGHER EDUCATION, AND SPECIAL EDUCATION (p. 337)
• Diversity Certificate
• Interprofessional Teaming in Early Childhood

Educational Foundations & Leadership (p. 362)
• Culture and Change in Institutions Certificate
• Educational Assessment Specialist Certificate
• Foundations of Peace Education Certificate
• Higher Education Administration Certificate
THE COLLEGE OF GRADUATE STUDIES

2018-2019 graduate Catalog

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 UT 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.

ADMINISTRATION
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Dean, College of Graduate Studies
University Hall, Room 3190
Mulford Library, Room 120
Mail Stop 933
Phone: 419.530.4968
Email: amanda.bryant-friedrich@utoledo.edu

Dr. Cyndee Gruden
Associate Dean for Academic and Student Affairs
University Hall, Room 3240
Mulford Library, Room 119
Mail Stop 933
Phone: 419.530.5254
Email: cyndee.gruden@utoledo.edu

College Procedures and Policies
- Admission Application Forms (p. 392)
- Admission Requirements (p. 392)
- Classification of Students (p. 393)
- Concurrent Enrollment Program (p. 394)
- Financial Assistance (p. 394)
- Letter of Admission (p. 394)

COGS Graduate Student Handbook (http://www.utoledo.edu/graduate/files/Graduate%20Student%20Handbook%202015-2016.pdf)

Admission Application Forms

Applications are submitted electronically at http://apply.utoledo.edu. The application along with transcripts and other required documents (statement of purpose, letters of recommendation) must be filed at least three weeks prior to registration in order to be considered. A non-refundable application fee of $45 for domestic applicants, $75 for international applicants is required in order for the application to be reviewed. Please note some departments or programs require applicants to also submit an application using the Centralized Application System. Please check your individual department for their requirements. Regardless of any additional application required, 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 his or her undergraduate program, 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. The specific minimum requirements are:

- **Earned Degree:** All graduate applicants must possess 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 are required to forward results of the GRE. GMAT is required for all business applicants. On the basis of the results of these examinations, the department will make a recommendation to the College of Graduate Studies. Other criteria affecting status of admission are program-specific.

- **GRE requirement:** It is within the discretion of the various departments to require the GRE (general test-institution code 1845) for all applicants. Please refer to the department website to determine if the GRE is required of all applicants. All international applicants who do not have a degree earned from a U.S. regionally accredited institution will 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)

- **GMAT requirement:** The GMAT is required of all applicants seeking admissions to the College of Business & Innovation. GRE scores may be used in lieu of the GMAT. Please check with the College of Business & Innovation. JD/MBA students may submit LSAT scores in lieu of the GMAT.

- **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.
  - **TOEFL/IELTS requirement:** See below for details.

Transcript Requirement
The College of Graduate Studies requires official transcripts from all universities/colleges you are currently attending or have attended.

Domestic Students
- **Official transcripts are those sent directly from the institution to the College of Graduate Studies.**
• Transcripts not received directly from the institution will be considered unofficial.
• Only official transcripts will be acceptable for final admission to the program.
• You may use the attached form to request transcripts from your other institutions - http://www.utoledo.edu/graduate/files/Transcript_request.pdf

International Students
• Official transcripts/mark sheets are those sent directly from the institution to the College of Graduate Studies.
• Transcripts/mark sheets not received directly from the institution will be considered unofficial.
• Only official transcripts/mark sheets will be acceptable for final admission to the program.
• You must also provide official certified, or attested copies of all graduation certificates, diplomas or degree certificates needed to fulfill your admission.
• If you earned a degree from a U.S. degree granting institution, simply order a transcript to be sent to us directly from the school’s Registrars’ Office. We do not make photocopies of official documents.
• Documents given to the Graduate Admissions Office become the property of the College of Graduate Studies and will not be returned or forwarded.
• IMPORTANT NOTICE ABOUT TRANSLATIONS - You must submit clear and legible photocopies of precise word-for-word English translations of all foreign language documents. English translations must be provided by the issuing institution or you may contact a translation service. Please refer to http://naces.org/members.htm for a list of acceptable evaluators. All arrangements must be made by you directly with the translation service.

Official transcripts showing all credits (graduate and undergraduate) and all degrees earned must be submitted to the College of Graduate Studies from the issuing institution. Students who fail to provide official transcripts within the first semester of enrollment will not be permitted to register in subsequent semesters. Note: An official transcript is defined as one that is received directly from the issuing institution in a sealed envelope.

TOEFL Requirement
In addition to the requirements for regular admission, all applicants whose native language is not English must submit scores from a standardized test of English as a foreign language unless the applicant has graduated from a U.S., regionally accredited college or university or completed at least one full time academic year of study from a regionally accredited institution earning a 3.0 or greater GPA. Language instruction courses do not fulfill this requirement. Applicants must achieve a minimum score on a standardized test of their choice as indicated below.

<table>
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<tr>
<th>Minimum Score MC</th>
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<tbody>
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<td>TOEFL PBT</td>
<td>550</td>
</tr>
<tr>
<td>TOEFL IBT</td>
<td>80</td>
</tr>
<tr>
<td>IELTS</td>
<td>6.5</td>
</tr>
<tr>
<td>MCAT</td>
<td>Varies by Department</td>
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</tbody>
</table>
Concurrent Enrollment Program

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 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.

Financial Assistance

Assistantships are available for students studying for advanced degrees. Students holding assistantships receive a stipend for service as assistants and a tuition fee award. Contact department chairs or designated directors of graduate programs for application procedures.

A limited number of University Fellowships are available in doctoral areas for outstanding students. Letters of recommendation including from the student’s University of Toledo advisor are required in addition to the application. Fellowship recipients receive a stipend during the academic year and a scholarship for tuition and fees.

Scholarships from foundations and societies are available to students who have maintained a high undergraduate and graduate scholastic record. Such scholarships usually permit full- or part-time study. Prospective students are advised to inquire directly with departments, colleges or agencies that provide scholarships or other financial support.

Letter of Admission

A letter of admission will be mailed to the student upon the recommendation of the admitting department and final approval of the College of Graduate Studies. Only the College of Graduate Studies is authorized to provide admission into graduate programs.

Academic Regulations

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- Academic Standards (p. 394)
- Academic Fresh Start (p. 395)
- Courses for Graduate Study (p. 395)
- Advising (p. 395)
- Plan of Study (p. 396)
- Graduate Research Advisory Committee Approval & Assurances (GRAD) Form (p. 396)
- Acceptance of Thesis or Dissertation for Defense (p. 396)
- Intellectual Protection and Patent Sign-Off (p. 396)
- Approval of Project/Thesis/Dissertation Forms (p. 396)
- Minimum Enrollment (p. 396)
- Transfer of Credits (p. 396)
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- Master’s Thesis (p. 397)
- Application for Admission to Candidacy for the Doctoral Degree (p. 397)
- Doctoral Dissertation (p. 397)
- Dissertation Committee (p. 397)
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- Residence Requirements for the Ph.D. and Ed.D. Degrees (p. 398)
- Time Limitations for Degrees (p. 398)
- Graduate Student Enrollment Status Policy Statement (p. 398)
- Graduate Student Academic Dishonesty Policy Statement (p. 398)
- Graduate Student Academic Grievance Policy Statement (p. 399)
- Graduate Student Leave of Absence Policy Statement (p. 399)

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. 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

A minimum cumulative GPA of 3.0 (four-point grading system) in graduate coursework is required for graduation. Graduate students whose cumulative GPA falls below 3.0 during any semester will be placed on academic probation. Depending on the program, a full-time student on academic probation will have one or at most two semesters (excluding summers) 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. A grade of C is the minimum passing grade for graduate courses. Therefore, any graduate course in which a grade below “C” or grade of “U” was earned will not be used to fulfill graduation requirements. Grades of below “C” will continue to be counted in calculating the cumulative grade point average. Individual programs may offer a specific number of credit hours with earned grades of C or below to be repeated one time. Colleges are permitted to establish individual program course retake standards. However, such standards shall not exceed two courses up to a maximum
of 12 credit hours. Both the original and repeated grades will appear on the transcript and be calculated into the cumulative GPA. Colleges/ departments/degree programs may enact additional coursework grade requirements beyond the minimum standard established here by the Graduate Faculty. Graduate students shall be responsible to consult with the appropriate graduate degree program director for the applicable standards.

Grades of A, A+, B+, B, B-, C+, C, C-, D+, D, D-, F, S, U, WP, or WF may be awarded depending on College/program/departmental policies. A limited number of graduate courses earn grades of S (Satisfactory) or U (Unsatisfactory) upon completion. A grade of S will be allowed for credit toward graduation but is not computed in the grade point average. A grade of U earns no credit and the course must be repeated to earn graduate credit but is not computed in the grade point average. The grade of PR may be awarded to indicate work in progress and courses with this grade will not be included in the GPA calculation. The assignment of this grade is highly discouraged unless extenuating circumstances exist. The grade of IN is assigned only under extraordinary circumstances when unexpected events prevent a student from completing the requirements of the course within the term of enrollment. The student must complete the required work before the end of the following semester (excluding summers) in which the IN grade was received; otherwise the grade will be converted to the grade of F by the Office of the Registrar. The student may initiate a request for an additional semester to complete the work for the grade (excluding summers). The extension is granted upon the approval of the faculty member and the associate dean of the college offering the course. Once the IN grade has been converted to F, the student must re-register and take the course again. The grade of IN will not be included in the GPA calculation. It is recommended that faculty set specific benchmarks for completion of the course or material each term, and regularly assign S, U or IN grades as appropriate instead of awarding a PR. Students may not graduate with a grade of U, IN, or PR on their Plan of Study. Students may not graduate with a grade of IN or PR on their transcript. A grade of WP (withdrawal passing) or WF (withdrawal failing), according to the status of the student at the time of withdrawal, will be assigned to students who withdraw after the university established withdrawal period at the discretion of the instructor. The grade of WP will not be included in the GPA calculation. A grade of WF indicates that a student's work is unsatisfactory (grade of less than C), and will be included in the GPA calculation as a grade of F. Students may repeat courses with grades WF or U subject to the maximum credit hour repeat limitation.

**Academic Fresh Start**

A student who meets all of the criteria described below may petition the Vice Provost for Graduate Affairs and Dean of the College of Graduate Studies to remove from his/her graduate cumulative grade point average at the University of Toledo. The petition must first be approved through the appropriate academic college channels prior to submission to the College of Graduate Studies.

- Degree seeking graduate student.
- Had previous enrollment at The University of Toledo.
- Not enrolled at The University of Toledo for at least two years prior to current enrollment. Under exceptional circumstances a student may apply to the College of Graduate Studies for a waiver of the two-year rule.
- Under exceptional circumstances a student may apply to the College of Graduate Studies for a waiver of the two-year rule.
- Maintain a current graduate grade point average of 3.0 or better for the first semester of re-enrollment if full-time or the first 12 credits of re-enrollment if part-time (not to exceed three semesters)

If the student's petition is granted, the following will apply:

- This policy only applies to the student's graduate grade point average. There is no impact on a student's earned hours.
- All University of Toledo grades will remain on the student's official, permanent academic record (transcript); this process will affect the cumulative graduate grade point average only. It will not remove evidence/documentation of the student's overall academic history at the university.
- No grades/credits from the student's prior graduate enrollment at the university may be counted toward the subsequent degree program requirements. Degree requirements may only be met by courses included in the calculation of the student's cumulative graduate grade point average at The University of Toledo. Thus, the student who successfully petitions for cumulative graduate grade point average recalculation under this policy automatically forfeits the right to use any of the excluded course work toward the current degree requirements.
- Credit earned from other institutions during the two-year period will not be accepted for transfer credit.

A student may exercise this graduate academic fresh start option only once, regardless of the number of times the student enters/attends a graduate degree program at The University of Toledo.

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:

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<th>Course Range</th>
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<tr>
<td>6000-6990</td>
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</tr>
<tr>
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<td>Doctoral level</td>
</tr>
<tr>
<td>8000-8990</td>
<td>Advanced doctoral level</td>
</tr>
</tbody>
</table>

**Advising**

The College of Graduate Studies at The University of Toledo 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 program contact is appointed. The student should address questions concerning the program to the faculty member and seek advice prior to registration. All questions regarding advising should be directed to the academic college. The College of Graduate Studies works with the advisor as identified on the required academic programs forms (i.e. Plan of Study and GRAD form).

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.

Graduate Research Advisory Committee Approval & Assurances (GRAD) Form

Students must complete the GRAD form and receive the required approvals prior to beginning any research for a 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.

This form normally 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.

Acceptance of Thesis or Dissertation for Defense

All graduate students engaged in thesis or dissertation research who are required to present/defend their work are required to submit a completed Acceptance of Thesis or Dissertation for Defense form no later than 15 days prior to their scheduled defense date. This form is designed to accompany the Intellectual Protection and Patent Sign-off form to prevent the public disclosure of proprietary information during a defense, as well as to permit the posting of the defense announcement on the Graduate College website. This form is to be submitted with the Intellectual Protection and Patent Sign-off form.

Intellectual Protection and Patent Sign-Off

All graduate students engaged in thesis or dissertation research are required to submit a completed Intellectual Property and Patent Sign-Off form. This form is designed to protect both the student’s and the University’s legal rights in any invention resulting from the student’s research efforts. If potential intellectual property is identified, this form allows for the publication delay of the dissertation or thesis to provide time to file the necessary legal papers, but it will not interfere with the student’s graduation schedule. All requests for a delay will be granted in increments of one year, and are renewable with the submission of a new Intellectual Protection form no later than thirty (30) days prior to the expiration of the delay, for a maximum of four (4) times. This form should be submitted with the Acceptance of Thesis or Dissertation for Defense form no later than 15 days prior to the scheduled defense date. If there is no defense, the form must be submitted by the last day of classes, which is also the deadline for uploading to OhioLINK.

Approval of Project/Thesis/ Dissertation Forms

This form is required of all students completing a project, thesis, or dissertation requirement. It must be submitted in paper copy with all original signatures by the last day of the term in which the degree will be awarded. No exceptions, waivers, or extensions to this deadline will be granted.

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. However, students who apply for graduation during the summer term also 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. 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

Application for transfer of credit must be made to the student’s advisor. The department/college will communicate its recommendation to the Graduate College by completing this form. The form with all approval signatures should be returned to the respective College of Graduate Studies Office for review and final approval. Please use one form for
Application for Admission to Candidacy for the Doctoral Degree

Students typically apply for admission to candidacy following the completion of coursework and any required qualifying examinations. At the time a student applies for admission to candidacy, the following requirements must be fulfilled:

- a GPA of 3.0 on a 12-point system for all courses completed and
- satisfactory completion of the examination requirements of the specific college or department.

The Admission to Candidacy form is available on the College of Graduate Studies’ website. It is the student’s responsibility to initiate the application. A student who fails to qualify for candidacy at the required time will not be permitted to continue.

Doctoral Dissertation

All departments require a dissertation in partial fulfillment of the doctoral degree. 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 OhioLINK and to publish their document with ProQuest by selecting the transfer paper option in OhioLINK. Procedures for proper submission of a dissertation are available on the College of Graduate Studies’ website. The Manual for the Formatting of Graduate Dissertations and Theses authorized by the Graduate Council is available on the site which details the requirements for preparing your document.

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 UT faculty must be members of UT’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 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 dean of the College of Graduate Studies.

For complete transfer credit policy at the graduate level, see Policy Number 3364-77-06 http://www.utoledo.edu/policies/.

Foreign Language Requirement

The student is required to meet the foreign language requirement of the specific department or college. The "Instructions and Application for the Foreign Language Exam" are available on the College of Graduate Studies’ website.

Master's Thesis

Certain departments 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 OhioLINK and to publish their document with ProQuest by selecting the transfer paper option in OhioLINK. Procedures for proper submission of a thesis are available on the College of Graduate Studies’ website. The Manual for the Formatting of Graduate Dissertations and Theses authorized by the Graduate Council is available on the site which details the requirements for preparing your document.

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 graduate dean. Full membership on the graduate faculty is a prerequisite to chairing a master's thesis committee.
Graduation Procedures

Students must apply for graduation by the posted deadline for the term. Graduation information is available on the College of Graduate Studies’ website. 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 early in the semester of intended graduation. Graduate students completing all degree requirements will receive the official diploma approximately six to eight weeks 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 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.

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. Although exceptions may be warranted, students who exceed the norm shall be required to justify in writing their request for an extension. Additional information is located in the Graduate Student Handbook and forms are available on the College of Graduate Studies’ website.

Graduate Student Enrollment Status Policy Statement

Policy Number: 3364-77-05 http://www.utoledo.edu/policies/

The university recognizes the role of enrollment status in support of satisfactory academic progress towards degree completion. A student’s enrollment status is determined by the number of class hours the student is enrolled in credit bearing courses during a semester or during an entire summer term. The definitions are as follows: A full-time graduate student is enrolled for a minimum of 9 or more semester hours in credit bearing courses. A full-time student who elects to enroll in more than 18 credit hours in fall or spring (combined total of more than 15 semester credit hours in summer) is considered to be on academic overload. A part-time graduate student is enrolled for fewer than 9 semester hours in credit bearing courses. Audit means a student is enrolled in credit bearing courses but elects not to receive credit. A student enrolled in a full-time and transcripted internship placement will be considered a full-time student for purposes of reporting to the National Clearinghouse if the time commitment required for the internship equates to the time commitment of a graduate student enrolled in 9 semester hours. This policy applies to all graduate students. Each college may establish additional credit hour requirements based upon degree program requirements, graduate assistantship appointments, or other considerations deemed necessary to the program or college. Please visit the University Policy Website to view the complete policy.

For additional details regarding enrollment status, please visit the Registrar’s Office Website: https://www.utoledo.edu/offices/registrar/student_records/enrollment_status.html.

Graduate Student Academic Dishonesty Policy Statement

Policy Number: 3364-77-01 http://www.utoledo.edu/policies/

Academic dishonesty will not be tolerated. Among the aims of education are the acquisition of knowledge and development of the skills necessary for success as an educator or in another profession. Activities inconsistent with these aims will not be permitted. Graduate students are responsible for knowing what constitutes academic dishonesty; if students are uncertain, for example about what constitutes plagiarism...
or cheating, they should seek the instructor’s advice. The purpose of 
the policy is to outline the procedures that allow graduate students to 
appeal an adverse decision by their college in an instance of academic 
dishonesty. Please visit the University Policy Website to view the complete 
policy.

**Graduate Student Academic 
Grievance Policy Statement**

**Policy Number: 3364-77-02 http://www.utoledo.edu/policies/**

The graduate student grievance policy covers appeals in which a 
graduate student disputes (grieves) a particular grade. Appeals dealing 
with academic dishonesty, including, but not limited to, cheating and 
plagiarism, are explicitly exempt from this process and shall be dealt 
with under the procedures outlined in the Graduate Academic Dishonesty 
Appeal Policy (3364-77-01). The purpose of the policy is to provide 
graduate students and their colleges with the procedures to follow to 
grieve a particular grade after appeals within their respective college are 
exhausted. This policy grants the graduate student the right to appeal in 
writing to the Dean of the College of Graduate Studies for further and final 
consideration of the student’s appeal. Please visit the University Policy 
Website to view the complete policy.

**Graduate Student Leave of Absence 
Policy Statement**

**Policy Number: 3364-77-04 http://www.utoledo.edu/policies/**

Students enrolled in a graduate degree program (or graduate certificate 
program), who do not expect to make progress towards degree 
requirements for a period of time due to personal, medical, call to active 
military duty, or other compelling reasons may request a leave of absence 
from a degree program. Students on an approved leave may not make 
significant use of university resources and services and do not have 
the rights and privileges of registered students. Students cannot fulfill 
any official department or university requirements during the leave 
period. Students on an approved leave must complete the Application for 
Graduate Readmission at the end of the leave in order to register and to 
have the rights and privileges of registered students. If a student does 
not return to the graduate degree program within the approved period for 
which the leave was granted, the student will be considered as having 
withdrawn from the university. To be reconsidered for graduate study, 
students who have withdrawn must complete the necessary application 
materials and pay all associated fees. Students called to active duty 
while enrolled in graduate school will follow regulations for military 
leave of absence per section 3345.53 of the Ohio Revised Code. It is the 
responsibility of the student to resolve all issue pertaining to registration, 
financial support, federal financial aid, and outstanding balances owed to 
the university. Students should also consider the potential implications 
of a leave on such matters as immigration status, health insurance, and 
loan repayment. Leaves approved in accordance with this policy, do not 
constitute a leave of absence for federal financial aid purposes. Please 
visit the University Policy Website to view the complete policy.

For additional details regarding the graduate student leave of absence 
process, please visit the College of Graduate Studies Website: http:// 
www.utoledo.edu/graduate/currentstudents/references/GradLOA.html.

**Other Policies and Information**

Other policies and information pertaining to graduate education may 
be found on the University Policy Website (http://www.utoledo.edu/ 
policies/) and the college and departmental catalog sections. Graduate 
students are encouraged to frequently check the “Current Students” 
section of The College of Graduate Studies website for up-to-date 
information, the Graduate Student Handbook, and/or the individual college 
departments for specific program policies.

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process, please visit the College of Graduate Studies Website: http:// 
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ACCOUNTING (ACCT) (ACCT)

ACCT 5000 Financial And Managerial Accounting
[3 credit hours (3, 0, 0)]
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 5120 External Financial Reporting II
[3 credit hours (3, 0, 0)]
This class concentrates on financial accounting for corporations and emphasizes the liability and owner’s equity sections of the balance sheet and related income statement issues.
Prerequisites: ACCT 3110
Term Offered: Spring, Summer, Fall

ACCT 5320 Internal Reporting
[3 credit hours (3, 0, 0)]
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.
Prerequisites: ACCT 3110
Term Offered: Spring, Summer, Fall

ACCT 5420 Auditing
[3 credit hours (3, 0, 0)]
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 5120 or ACCT 3120 and ACCT 3310
Term Offered: Spring, Summer, Fall

ACCT 5940 Internship
[1-3 credit hours (0, 0, 0-3)]
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 External Financial Reporting III
[3 credit hours (3, 0, 0)]
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 or ACCT 5120
Term Offered: Spring, Fall

ACCT 6150 International Accounting And Taxation
[3 credit hours (3, 0, 0)]
Analysis of accounting issues crucial to multinational companies. Issues to be addressed include: comparing accounting across countries, effects of harmonization of financial reporting requirements and the translation of foreign currency financial statements.
Prerequisites: ACCT 6210 (may be taken concurrently)
Term Offered: Spring, Fall

ACCT 6190 Contemporary Accounting Problems
[3 credit hours (3, 0, 0)]
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 6210 and ACCT 6130)
Term Offered: Spring, Summer, Fall

ACCT 6210 Research In Accounting And Taxation
[3 credit hours (3, 0, 0)]
Provides the methodology necessary for accountants to perform effective, efficient and ethical accounting and tax research and the means of communicating those results.
Prerequisites: ACCT 3120 or ACCT 5120 and ACCT 3210
Term Offered: Spring, Fall

ACCT 6250 Corporate Taxation
[3 credit hours (3, 0, 0)]
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 and ACCT 5120 or ACCT 3120
Term Offered: Spring, Summer, Fall

ACCT 6310 Advanced Managerial Accounting
[3 credit hours (3, 0, 0)]
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 or ACCT 5320
Term Offered: Summer, Fall

ACCT 6330 Advanced Topics In Accounting Information Systems
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring, Fall

ACCT 6410 Governmental And Not-For-profit Accounting
[3 credit hours (3, 0, 0)]
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 or ACCT 5120
Term Offered: Spring, Fall
ACCT 6430 Business Valuation And Analysis
[3 credit hours (3, 0, 0)]
Analyzes business analysis and valuation techniques with major emphasis placed on how a firm's financial reporting decisions affect fundamental analysis.
Prerequisites: ACCT 3120 or ACCT 5120
Term Offered: Spring, Fall

ACCT 6440 Advanced Auditing
[3 credit hours (2, 0, 1)]
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 or ACCT 5420
Term Offered: Spring, Fall

ACCT 6450 Fraud and Forensic Accounting
[3 credit hours (2, 1, 0)]
This course is designed to introduce the student to the basic concepts of Fraud Examination and Forensic Accounting.
Prerequisites: ACCT 4420 or ACCT 5420
Term Offered: Spring, Summer

ACCT 6960 Independent Study In Accounting
[1-3 credit hours (0, 0, 0-3)]
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 for Physician Assist
[5 credit hours (5, 5, 5)]
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: Spring, Fall

ANAT 6790 Microanatomy for Pathology Assistants
[4 credit hours (4, 0, 0)]
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 (0, 3, 3)]
Detailed dissections of specific body regions. May be repeated for credit.
Term Offered: Fall
ANTHROPOLOGY (ANTH)

ANTH 5450 Exploring the City
[3 credit hours (3, 0, 0)]
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: Fall

ANTH 5560 Fieldwork In Anthropology
[1-6 credit hours (0, 0, 0-12)]
Consists of field work involving the student in meaningful research problems at the community level. Introduces the student to the methods and problems of participant research.

ANTH 5740 Nutritional Anthropo-Logy
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
An examination of the biocultural nature of health and illness.
Term Offered: Spring, Fall

ANTH 5860 The Irish-American Experience
[3 credit hours (0, 0, 3)]
A survey of the sociohistorical and cultural factors related to the immigration and adaptation of the Irish in America.

ANTH 5920 Directed Readings In Anthropology
[1-3 credit hours (0, 0, 0-4)]
Designed for those wishing to continue course work in greater depth or seeking contact with unlisted subject areas. Written proposal and consent required.

ANTH 5980 Problems In Anthropology
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-4)]
Supervised independent research in anthropology.
Term Offered: Spring
ART EDUCATION (AED)

AED 5000 Research In Art Education
[4 credit hours (4, 0, 0)]
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 (0, 3, 0)]
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 5150 Setting The Stage For Early Childhood Learning: Inspirations From Reggio Emilia
[3 credit hours (0, 0, 15)]
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.

AED 5200 Computer Graphics In Art Education
[3 credit hours (0, 3, 0)]
This course examines the tools, technology and instructional application of computer graphics education settings. The course is appropriate for art educators as well as others interested in using graphics and the microcomputer.
Term Offered: Spring

AED 5220 Issues In Therapeutic Art
[3 credit hours (3, 0, 0)]
The study of art processes that provide physical, emotional and intellectual development. Topics covered include art history, art appreciation, aesthetics, making art and art materials.
Term Offered: Fall

AED 5240 Adaptive Methods In Art Education For Special Populations
[3 credit hours (3, 0, 0)]
This course is designed to provide understanding of how art experiences relate to special populations. Students will research and develop strategies and instructional adaptations for use with special populations in a therapeutic or rehabilitative setting.
Prerequisites: AED 5200

AED 5300 Media And Methods In Therapeutic Art
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

AED 5320 The Art Museum And The Art/Humanities Educator
[3 credit hours (3, 0, 0)]
This course will introduce the role of the museum for the art/humanities educator and will examine the installation and design of exhibitions and the implications for teaching. Life center issues, museum education, curriculum issues, interactive galleries and technology will be presented.
Term Offered: Spring, Summer, Fall

AED 5930 Advanced Seminar In Philosophy Of Art Education
[1-4 credit hours (0, 0, 0-4)]
Guest lecturers from other institutions of higher learning are invited 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 (0, 0, 0-4)]
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 (0, 0, 0-4)]
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 (0, 0, 0-4)]
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 (0, 0, 0-4)]
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 (3, 0, 0)]
Review and study of general physiological principles and bioengineering perspectives of the human circulatory, respiratory, digestive, immune, nervous, muscular and excretory systems.
Term Offered: Fall

BIOE 5260 Medical Imaging Systems I
[3 credit hours (3, 0, 0)]
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: EECS 3200
Term Offered: Spring

BIOE 5300 Analysis Of Bioengineering Systems
[3 credit hours (3, 0, 0)]
Application of modern computing methods to the numerical and statistical analysis of bioengineering systems.
Term Offered: Spring

BIOE 5620 Cellular Electrophysiology
[3 credit hours (3, 0, 0)]
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 5640 Applications of Biotransport
[3 credit hours (3, 0, 0)]
The application of engineering principles to the design and analysis of artificial organs and their clinical application.
Term Offered: Spring

BIOE 5650 Bioseparations
[3 credit hours (3, 0, 0)]
Practical and theoretical aspects of processes required to separate and purify cells, proteins and other biological compounds. This course will focus on new and nontraditional methods.
Prerequisites: BIOE 3500
Term Offered: Spring, Fall

BIOE 5710 Biomechanics of Soft and Hard Materials
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Introduction to and utilization of computational packages for bioengineering applications. Introduction to finite element analysis and applications in biomechanics, biofluidics, bioheat transfer, optimization.
Term Offered: Spring

BIOE 5740 Tissue Engineering
[3 credit hours (3, 0, 0)]
Application of principles from engineering and the life sciences toward the development of biological substitutes that restore, maintain, or improve tissue function.
Term Offered: Spring, Fall

BIOE 5750 Experimental Methods In Orthopedic Biomechanics
[3 credit hours (2, 3, 0)]
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 or CIVE 1160
Term Offered: Spring

BIOE 5930 Bioengineering Seminar
[0 credit hours (0, 0, 0)]
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 (0-3, 0, 0)]
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 (0, 0, 0-3)]
The student, under the guidance of their research adviser, explores in-depth specific areas or topics related to their thesis or dissertation research.
Corequisites: BIOE 5110
Term Offered: Spring, Summer, Fall

BIOE 6100 Computational Physiology
[3 credit hours (3, 0, 0)]
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 and BIOE 4100
Term Offered: Spring

BIOE 6210 Optical Instrumentation For Bioengineering
[3 credit hours (3, 0, 0)]
Introduction to the theory and design of topical instruments for bioengineers. Instruments using geometrical, physical and quantum optical principles will be discussed.
BIOE 6310 Cell and Tissue Engineering Laboratory
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 and BIOE 5780
Term Offered: Spring

BIOE 6730 Biological Transport Phenomena
[3 credit hours (3, 0, 0)]
Application of transport phenomena and reaction engineering in the understanding of signaling, growth processes and the flow of biological fluids in mammalian vessels in living systems.

BIOE 6920 Bioengineering Project
[1-6 credit hours (0, 0, 0-3)]
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
[1-12 credit hours (0, 0, 0-3)]
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 7260 Medical Imaging Systems I
[3 credit hours (3, 0, 0)]
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: EECS 3200
Term Offered: Spring

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

BIOE 8100 Computational Physiology
[3 credit hours (3, 0, 0)]
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 and BIOE 4100
Term Offered: Spring

BIOE 8210 Optical Instrumentation For Bioengineering
[3 credit hours (3, 0, 0)]
Introduction to the theory and design of topical instruments for bioengineers. Instruments using geometrical, physical and quantum optical principles will be discussed.

BIOE 8310 Cell and Tissue Engineering Laboratory
[3 credit hours (3, 0, 0)]
The application of engineering principles to the design and analysis of biological processes that employ living organisms or biochemicals.
Term Offered: Spring

BIOE 8310 Orthopaedic Biomechanics
[3 credit hours (3, 0, 0)]
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 and BIOE 5780
Term Offered: Spring

BIOE 8520 Orthopaedic Biomechanics
[3 credit hours (3, 0, 0)]
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 and BIOE 5780
Term Offered: Spring

BIOE 8730 Biological Transport Phenomena
[3 credit hours (3, 0, 0)]
Application of transport phenomena and reaction engineering in the understanding of signaling, growth processes and the flow of biological fluids in mammalian vessels in living systems.

BIOE 8960 Bioengineering Dissertation
[1-16 credit hours (0, 0, 0-4)]
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 8980 Special Topics In Bioengineering
[1-5 credit hours (0-3, 0, 0)]
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 (0, 0, 0-3)]
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
BIPG 5100 Fund Bioinformatics Proteomics
[3 credit hours (3, 3, 0)]
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 (1, 1, 0)]
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 5200 Statistical Meth Bioinformatic
[3 credit hours (3, 0, 0)]
Application of probability and statistics to bioinformatic analysis. Topics include stochastic processes, Markov chains, statistical basis for DNA sequence analysis, evolutionary models, and statistical analysis of functional genomic data. Includes computer laboratory sessions. May be taken concurrently with BIPG510/710.

Term Offered: Summer, Fall

BIPG 5300 Current Topics in BPG
[1 credit hour (1, 0, 0)]
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 (1, 1, 0)]
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 Microarray Analysis
[1 credit hour (1, 1, 0)]
This course aims at providing hands-on training on analysis of microarray data. Students will learn how to handle and analyze microarray data. Topics covered include preprocessing, identifying differentially expressed genes, classification and presentation of findings. Different platforms of microarray technologies will be covered in this course.

Term Offered: Summer

BIPG 5800 Rotations in BPG
[0-4 credit hours (0-4, 0-4, 0)]
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 5900 Scholarly Project in BPG
[0-12 credit hours (0, 0, 0)]
Students will develop an in-depth scholarly project to fulfill the research project requirements for the MSBS degree with a concentration in Bioinformatics, Proteomics and Genomics. May be repeated for credit.

Term Offered: Spring, Summer

BIPG 6100 Bioinformatic Computation
[3 credit hours (3, 3, 0)]
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 6400 Applications of Bioinformatics
[3 credit hours (0, 3, 0)]
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 6600 BIPG Internship
[1-6 credit hours (0, 0, 1-6)]
Focused practical training in Biomarker discovery and validation with a pharmaceutical-oriented company. Builds upon didactic course work.

BIPG 6700 Research in Bioinformatics
[1-6 credit hours (0, 1-6, 0)]
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 6890 Independent Study in BPG
[0-4 credit hours (0, 0, 0)]
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 (0, 1-15, 0)]
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 (3, 3, 0)]
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 (1, 1, 0)]
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 7200 Statistical Meth Bioinformatic
[3 credit hours (3, 0, 0)]
Application of probability and statistics to bioinformatic analysis. Topics
include stochastic processes, Markov chains, statistical basis for DNA
sequence analysis, evolutionary models, and statistical analysis of
functional genomic data. Includes computer laboratory sessions. May be
taken concurrently with BIPG510/710.
Term Offered: Fall

BIPG 7400 Biodatabases
[1 credit hour (1, 1, 0)]
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 (1, 1, 0)]

BIPG 8100 Bioinformatic Computation
[3 credit hours (3, 3, 0)]
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 (0, 3, 0)]

BIPG 8890 Independent Study in BPG
[0-4 credit hours (0, 0, 0)]
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.
BIOLOGY (BIOL)

BIOL 5030 Advanced Microbiology
[3 credit hours (3, 0, 0)]
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 (0, 3, 0)]
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 (3, 0, 0)]
The development, genetics and physiology of the immune response.
Term Offered: Spring, Fall

BIOL 5060 Advanced Immunology Laboratory
[1 credit hour (0, 3, 0)]
Laboratory studies of the immune response.
Corequisites: BIOL 5050
Term Offered: Fall

BIOL 5230 Advanced Comparative Animal Physiology
[3 credit hours (3, 0, 0)]
Lectures on the comparative and environmental physiology of vertebrates and invertebrates including metabolism, temperature regulation, respiration, circulation excretion and osmotic regulation.
Prerequisites: BIOL 3030 and BIOL 3070
Term Offered: Spring, Summer

BIOL 5980 Advanced Topics In The Biological Sciences For Science Educators
[1-3 credit hours (0-3, 0, 0)]
Lecture, seminar or distance learning course on current topics or problems in the biological sciences that are relevant for science educators.

BIOL 6000 Introduction To Scientific Thought And Expression
[3 credit hours (3, 0, 0)]
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
[4 credit hours (4, 0, 0)]
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 (0, 0, 2)]
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 6090 Advanced Cell Biology
[4 credit hours (4, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring

BIOL 6260 Topics in Cancer Biology
[3 credit hours (3, 0, 0)]
The course will cover our current understanding of carcinogenesis and provide in-depth discussion of the important topics and latest advances in cancer research.
Prerequisites: BIOL 6010 and BIOL 6090 and CHEM 6500
Term Offered: Fall

BIOL 6830 Molecular and Cellular Biology
[4 credit hours (0, 0, 4)]
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 (0, 0, 0-4)]
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 (0, 0, 1)]
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 (0, 0, 0-15)]
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 (0-4, 0, 0)]
Seminar/discussion of significant current topics or problems in biology.
**Term Offered:** Spring

BIOL 6990 Advanced Readings In Biology
[2-4 credit hours (0, 0, 0-4)]
Faculty directed readings or projects in a specific area of Biology.
**Term Offered:** Spring, Summer, Fall

BIOL 7030 Advanced Microbiology
[3 credit hours (3, 0, 0)]
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 (0, 3, 0)]
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 (3, 0, 0)]
The development, genetics and physiology of the immune response.
**Term Offered:** Spring, Fall

BIOL 7060 Advanced Immunology Laboratory
[1 credit hour (0, 3, 0)]
Laboratory studies of the immune response.
Corequisites: BIOL 7050
**Term Offered:** Fall

BIOL 8000 Introduction To Scientific Thought And Expression
[3 credit hours (3, 0, 0)]
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
[4 credit hours (4, 0, 0)]
Analysis of recent developments in prokaryotic and eukaryotic molecular biology through evaluation and discussion of current literature.
**Term Offered:** Fall

BIOL 8010 Advanced Molecular Biology
[4 credit hours (4, 0, 0)]
Analysis of recent developments in prokaryotic and eukaryotic molecular biology through evaluation and discussion of current literature.
**Term Offered:** Fall

BIOL 8090 Advanced Cell Biology
[4 credit hours (4, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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
**Term Offered:** Spring

BIOL 8260 Topics in Cancer Biology
[3 credit hours (3, 0, 0)]
The course will cover our current understanding of carcinogenesis and provide in-depth discussion of the important topics and latest advances in cancer research.
Prerequisites: BIOL 8010 and BIOL 8090 and CHEM 8500
**Term Offered:** Fall

BIOL 8900 Doctoral Dissertation Research
[1-15 credit hours (0, 0, 0-15)]
Research normally leading to the fulfillment of the Ph.D. dissertation requirement.
**Term Offered:** Spring, Summer, Fall

BIOL 8920 Special Projects In Biology
[2-4 credit hours (0, 0, 0-4)]
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 (0, 0, 1)]
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 (0, 0, 0-15)]
Research normally leading to the fulfillment of the Ph.D. dissertation requirement.
**Term Offered:** Spring, Summer, Fall

BIOL 8980 Advanced Topics In Biology
[2-4 credit hours (0-4, 0, 0)]
Seminar/discussion of significant current topics or problems in biology.
**Term Offered:** Spring

BIOL 8990 Advanced Readings In Biology
[2-4 credit hours (0, 0, 0-4)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (6, 0, 0)]
Supervised full time work experience in Biomarker discovery 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 (1, 0, 0)]
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 (0, 0, 1-16)]  
[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 8930 Graduate Seminar**  
[0 credit hours (0, 0, 0)]  
0 hour] Biomedical engineering research presentations by external speakers from industry, universities and other organizations.

**BME 8960 Dissertation**  
[1-16 credit hours (0, 0, 1-16)]  
[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 8980 Special Topics**  
[1-8 credit hours (0-8, 0, 0)]  
[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 (3, 0, 0)]
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 6250 Grant Writing Workshop
[2 credit hours (2, 0, 0)]
This is an interdisciplinary course designed to teach students skills in developing a research plan in the form of a grant proposal.
Term Offered: Spring

BMSP 6310 Systems Pathophysiology I
[2.5 credit hours (0, 0, 0)]
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 6320 Systems Pathophysiology II
[2.5 credit hours (0, 0, 0)]
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 6330 Curr Prob Res App Protein Str
[2.5 credit hours (2.5, 0, 0)]
The course will cover principles of protein structure/function relationships in proteins, protein folding, ligand-protein interactions and mechanism of enzyme-catalyzed reactions. Special emphasis will be given to the present-day research.
Term Offered: Fall

BMSP 6340 Curr Prob Res App Genes/Genom
[2.5 credit hours (2.5, 0, 0)]
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 (3, 0, 0)]
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 Curr Prob Cell Membranes
[3 credit hours (3, 0, 0)]
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 (1, 0, 0)]
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 Biomed Sciences
[3 credit hours (3, 0, 0)]
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 (1-15, 1-15, 0)]
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 (1, 0, 0)]
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 7320 Statistical Methods I
[3 credit hours (3, 0, 0)]
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 8250 Grant Writing Workshop
[2 credit hours (2, 0, 0)]
This is an interdisciplinary course designed to teach students skills in developing a research plan in the form of a grant proposal.
Term Offered: Spring

BMSP 8310 Systems Pathophysiology I
[2.5 credit hours (0, 0, 0)]
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 8320 Systems Pathophysiology II  
[2.5 credit hours (0, 0, 0)]  
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 (2.5, 0, 0)]  
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  
[2.5 credit hours (2.5, 0, 0)]  
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 (3, 0, 0)]  
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  
[3 credit hours (3, 0, 0)]  
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  
[3 credit hours (3, 0, 0)]  
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 (1-15, 1-15, 0)]  
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
BUSINESS ADMINISTRATION (BUAD)

BUAD 6100 Accounting For Decision Making
[3 credit hours (3, 0, 0)]
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 and ACTG 1050 or BUAD 2040 and BUAD 2050 or ACCT 5000
Term Offered: Spring, Summer, Fall

BUAD 6200 Financial Systems
[3 credit hours (3, 0, 0)]
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 or BUAD 2040 and BUAD 2050 or ACTG 1040 and ACTG 1050
Term Offered: Spring, Summer, Fall

BUAD 6300 Strategic Marketing And Analysis
[3 credit hours (3, 0, 0)]
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.
Prerequisites: MKTG 5410 or BUAD 3010
Term Offered: Spring, Summer, Fall

BUAD 6400 Results-Based Management
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 3020 or OPMT 5520 or OSCM 5520
Term Offered: Spring, Summer, Fall

BUAD 6800 Information Technology And E-Business
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 6200 and BUAD 6300)
Term Offered: Spring, Summer, Fall

BUAD 6920 Specialization Internship Opportunity
[1-4 credit hours (0, 0, 1-4)]
Receive practical business experience working in an organization, while meeting with other students and learning about their experiences.
Term Offered: Spring, Fall

BUAD 6980 Special Topics In Business Administration
[1-4 credit hours (0, 0, 1-4)]
Independent study to be arranged with the Director, M.B.A. program.
Term Offered: Spring, Summer, Fall
BUSINESS ANALYSIS (BANS)

BANS 6050 Health Care Economics
[3 credit hours (3, 0, 0)]
Health care national policy, third party payment systems, capital formation, delivery systems, health care budgeting and macro economic health issues are examined.
Prerequisites: ACCT 5000 or BANS 5210

BANS 6310 Business Forecasting
[3 credit hours (3, 0, 0)]
Study and use of forecasting models, managing and monitoring the forecasting function and communicating forecasts to management.
Prerequisites: (BANS 5210 and OPMT 5510)

BANS 6520 Managerial Economics
[3 credit hours (3, 0, 0)]
Economic concepts and technique applied to company-level decision making. Focus on demand analysis, applied regression analysis and the interface between economies and human resource management, production, marketing and finance.
Prerequisites: (BANS 5210 and OPMT 5510)

BANS 6740 Business Conditions Analysis
[3 credit hours (3, 0, 0)]
Course develops a framework for measuring, tracking and forecasting national, regional and international business conditions. Focus is on how external economic conditions in the world economy influence business decisions.
Prerequisites: (BANS 5210 and OPMT 5510)

BANS 7210 Economics For Business Decisions
[3 credit hours (3, 0, 0)]
An examination of the basic economic concepts and techniques used in business decision-making. The course covers micro- and macro-economic theories, history and evolution of economic institutions, ethical questions and economic applications to business decisions in a global environment.
BUSINESS LAW (BLAW)

BLAW 5150 Dynamics Of Legal Environment Of Business
[3 credit hours (3, 0, 0)]
Emphasis will be placed on the law in those areas which would assist the student to have a better understanding of those ethical and social problems in our increasingly more complicated legal environment.

BLAW 6040 Health Law
[3 credit hours (3, 0, 0)]
Provides an analytical framework for the understanding of the legal climate within which the health care institution operates. Emphasis on the legal concepts which bear upon current health care problems and operation and planning decisions.

BLAW 6100 Business, Government And Society
[3 credit hours (3, 0, 0)]
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 7150 Dynamics Of Legal Environment Of Business
[3 credit hours (3, 0, 0)]
Emphasis will be placed on the law in those areas that would assist the student to have a better understanding of those ethical and social problems in our increasingly more complicated legal environment.
CANCER BIOLOGY (CABP)

CABP 6250 Scientific Communication Skills and Cancer Goals
[2 credit hours (1, 0, 1)]
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 (3, 0, 0)]
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 (1, 0, 0)]
A readings and discussion course that will examine classic and current research publications from within the broad realm of cancer biology.
Term Offered: Spring

CABP 6730 Research in Cancer Biology
[1-15 credit hours (0, 0, 0)]
CABP 8890 Ind Study in Cancer Biology
[1-15 credit hours (0, 0, 0)]
Intensive study in the field of cancer biology including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring, Summer, Fall

CABP 8730 Research in Cancer Biology
[1-15 credit hours (0, 0, 0)]

CABP 8890 Ind Study in Cancer Biology
[1-15 credit hours (0, 0, 0)]
Intensive study in the field of cancer biology including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring, Summer, Fall

CABP 8250 Scientific Communication Skills and Cancer Goals
[2 credit hours (1, 0, 1)]
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 (3, 0, 0)]
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 (1, 0, 0)]
A readings and discussion course that will examine classic and current research publications from within the broad realm of cancer biology.
Term Offered: Spring
CAREER AND TECHNICAL EDUCATION (CTE)

CTE 5010 Teaching Occupational Skills
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 5040 Laboratory Organization And Management
[3 credit hours (3, 0, 0)]
Designed for laboratory instructors to increase their operating efficiency and effectiveness. Focus is on arranging the facility and controlling materials, supplies, learning activities and maintenance through various system approaches.

CTE 5050 Methods for Teaching CTE Methods I
[2 credit hours (2, 0, 0)]
This course is required for the Health Careers, Career-Technical Education and the six Career-Technical Licenses. The pedagogical and management skills introduced in CTE 4010 are integrated in a contextual framework utilizing an actual laboratory situation. Learning styles; laboratory planning, instruction, technology, and management; integrated academics; performance 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: Fall

CTE 5060 Foundations Of Career And Technical Education
[3 credit hours (3, 0, 0)]
A study of social issues, historical events and philosophies that provide a basis for the development of career and technical education. Principles and their implications are also reviewed.
Term Offered: Fall

CTE 5070 CTE Methods II
[2 credit hours (2, 0, 0)]
This course is required for the Health Careers, Career-Technical Education and the six Career-Technical Licenses. The pedagogical and management skills introduced in CTE 4030 are integrated in a contextual framework utilizing an actual classroom setting. Organizing curriculum; instructional planning, management, delivery and technology; learning theory; behavior management; motivation; integrated academics; authentic assessment; career-technical student organizations; etc. are the basis for student research, reflection, and inquiry.
Term Offered: Spring

CTE 5080 Principles Of School-To-work Transition
[3 credit hours (3, 0, 0)]
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 5100 Organization, Administration & Regulations Of Career And Technical Education
[3 credit hours (3, 0, 0)]
Study of the organization and administration of career and technical education at the national, state and local levels, noting relationships existing between the agencies.
Term Offered: Spring

CTE 5110 Seminar for CTE Teachers
[3 credit hours (0, 0, 3)]
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 are: a clear mission; operational goals; specific competencies of an assessment system.
Term Offered: Spring

CTE 5120 Supervision Of Career And Technical Education
[3 credit hours (3, 0, 0)]
Development of supervisory skills in career and technical education. Stresses human relations, team building, basic management and leadership skills in program inauguration and operations.
Term Offered: Fall
CTE 5140 Cooperative Education
[2 credit hours (2, 0, 0)]
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: Spring, Summer, Fall

CTE 5160 Curriculum Development & Teaching
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 5220 Adviser Training For Youth Leaders
[3 credit hours (3, 0, 0)]
Designed for teachers and supervisors to increase their skills and knowledge of youth leadership development. Focus is on advising a student career and technical organization and includes both establishing and maintaining functions.
Term Offered: Summer

CTE 5570 Teaching Adult Learners
[3 credit hours (3, 0, 0)]
A study of the unique learning and teaching characteristics associated with adult learners, adult learning theory, learner characteristics, physical effects of aging and strategies consistent with adult learning styles.
Term Offered: Fall

CTE 5810 Staff Evaluation And Development
[3 credit hours (3, 0, 0)]
An analysis of the processes and current instruments available for evaluation of programs and personnel, and an appraisal of the professional development needs of individuals in educational settings.

CTE 5830 Curriculum Principles And Models
[3 credit hours (3, 0, 0)]
Curriculum principles and models are examined. The characteristics of curricula are established and inferences are drawn for the planning, implementation and evaluation phases of curriculum development.

CTE 5930 CTE Supervised Teaching
[4 credit hours (0, 0, 4)]
This course is required for the Health Careers, Career-Technical Education and the six Career-Technical Licenses. A planned field experience will be completed in public school classrooms under the direction of university facilitated induction teams. The university faculty member, on-site teacher mentor, and local administrator will collaborate to assure the novice teacher maximizes his/her potential as an individual and member of an educational team. Students are provided a contextual framework to integrate theory and practice.
Term Offered: Spring, Fall

CTE 5940 Practicum-Internship In Career And Technical Education
[1-3 credit hours (0, 0, 0-1)]
Observation and supervised experiences will be offered in a variety of appropriate settings, or students will be assigned to work as interns in a school setting under the joint supervision of school and university personnel.
Term Offered: Spring, Summer, Fall

CTE 5950 Workshop In Career And Technical Education
[1-5 credit hours (0, 0, 0-1)]
Workshops developed around topics of interest and concern for preservice and inservice teachers and other education personnel. Practical applications of workshop topics will be emphasized.

CTE 5980 Problems In Career And Technical Education
[1-5 credit hours (1-5, 0, 0)]
A course developed around topics of interest and concern to inservice teachers and administrators. Stresses solution and resolution of educational problems occurring within selected districts.
Term Offered: Spring, Summer, Fall

CTE 5990 Individual Study In Career And Technical Education
[1-3 credit hours (0, 0, 0-1)]
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: Fall

CTE 6900 Research In Career And Technical Education
[1-3 credit hours (0, 0, 0-1)]
This course is required for the Health Careers, Career-Technical Education and the Career-Technical Licenses. The course provides the knowledge and skill in competency-based education. It includes occupational analysis; selection of course content; course of study and instructional guide development; and, credentialing students. Utilizing the Career Field Content Standards the teacher is prepared to draw from their content expertise and experiences to plan and develop instruction that addresses curriculum goals of diverse and special populations.
Term Offered: Spring

CTE 6920 Master's Research Project In Career And Technical Education
[1-3 credit hours (0, 0, 0-1)]
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

CTE 6960 Master's Thesis In Career And Technical Education
[1-3 credit hours (0, 0, 0-1)]
Open to a graduate student who elects the completion of a master's thesis in fulfilling the research requirement of the master's degree.
CTE 7810 Staff Evaluation And Development
[3 credit hours (3, 0, 0)]
An analysis of the processes and current instruments available for evaluation of programs and personnel, and an appraisal of the professional development needs of individuals in educational settings.

CTE 7830 Curriculum Principles And Models
[3 credit hours (3, 0, 0)]
Curriculum principles and models are examined. The characteristics of curricula are established and inferences are drawn for the planning, implementation and evaluation phases of curriculum development.

CTE 7840 Practicum-Internship In Career And Technical Education
[1-3 credit hours (0, 0, 0-1)]
Observation and supervised experiences will be offered in a variety of appropriate settings, or students will be assigned to work as interns in a school setting under the joint supervision of school and university personnel.
Term Offered: Summer

CTE 7950 Workshop In Career And Technical Education
[1-5 credit hours (0, 0, 0-1)]
Workshops developed around topics of interest and concern for preservice and inservice teachers and other education personnel. Practical applications of workshop topics will be emphasized.

CTE 7980 Problems In Career And Technical Education
[1-5 credit hours (1-5, 0, 0)]
A course developed around topics of interest and concern to inservice teachers and administrators. Stresses solution and resolution of educational problems occurring within selected districts.
Term Offered: Summer

CTE 7990 Individual Study In Career And Technical Education
[1-3 credit hours (0, 0, 0-1)]
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.
CHEMICAL AND ENVRNMNTL ENGNRNG (CHEE)

CHEE 5410 New Separations
[3 credit hours (0, 0, 3)]
Introduction to and analysis of new separation techniques relevant to downstream processing of bioreactor products. Topics include new extraction and adsorption methods, chromatography techniques, ultrafiltration and electrokinetic methods such as electrophoresis and isoelectric focusing.  
Term Offered: Spring, Fall

CHEE 5800 Polymer Science And Engineering
[3 credit hours (0, 0, 3)]
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
[1 credit hour (0, 0, 1)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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  
Term Offered: Spring

CHEE 6120 Biofuels
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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.  
Term Offered: Spring

CHEE 6510 Advanced Chemical Engineering Thermodynamics
[3 credit hours (0, 0, 3)]
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: Fall

CHEE 6550 Transport Phenomena I
[3 credit hours (3, 0, 0)]
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: Fall

CHEE 6560 Transport Phenomena II
[3 credit hours (0, 0, 3)]
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.  
Prerequisites: CHEE 6550  
Term Offered: Spring

CHEE 6680 Polymer Laboratory Methods
[3 credit hours (0, 0, 3)]
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 6690 Chemical Engineering Project
[1-6 credit hours (1-6, 0, 0)]
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 6920 Chemical Engineering Project
[1-6 credit hours (1-6, 0, 0)]
Graduate research towards the completion of a Master's Degree.  
Term Offered: Spring, Summer, Fall

CHEE 6970 Graduate Industrial Internship
[1-6 credit hours (0, 0, 1-6)]
Academic advisor approved industrial or non-profit internship to provide an experiential learning component to the Masters degree program.  
Term Offered: Spring, Summer

CHEE 6980 Special Topics In Chemical Engineering
[1-6 credit hours (0, 0, 0-3)]
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 7930 Seminar in Chemical Engineering
[1 credit hour (0, 0, 1)]
CHEE 8010 Green Engineering Principles
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring

CHEE 8120 Biofuels
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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.
Term Offered: Spring

CHEE 8510 Advanced Chemical Engineering Thermodynamics
[3 credit hours (0, 0, 3)]
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: Fall

CHEE 8550 Transport Phenomena I
[3 credit hours (0, 0, 3)]
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: Fall

CHEE 8560 Transport Phenomena II
[3 credit hours (0, 0, 3)]
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.
Prerequisites: CHEE 8550
Term Offered: Spring

CHEE 8860 Polymer Laboratory Methods
[3 credit hours (0, 0, 3)]
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
[1-15 credit hours (0, 0, 0-6)]
Graduate research towards the completion of a Doctoral Degree.
Term Offered: Spring, Summer, Fall

CHEE 8980 Special Topics In Chemical Engineering
[1-6 credit hours (0, 0, 0-3)]
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
CHEMISTRY (CHEM)

**CHEM 5100 Principles of Organic and Inorganic Chemistry**
[4 credit hours (4, 0, 0)]
Study of coordination compounds with a focus on ligand bonding, electron counting, molecular orbital theory, reactivity, and catalysis. In addition, polymerization, structure-property relationships, and commercial materials will be explored. A review of undergraduate-level general and organic chemistry topics with discussions concerning teaching these subjects is also included.

**Term Offered:** Summer

**CHEM 5160 Chemistry Laboratory Techniques Development**
[2 credit hours (0, 2, 0)]
Study of general and organic chemistry laboratory techniques, such as the characterization, structural determination and reactions of organic and inorganic compounds, with an emphasis on pedagogical aspects of the techniques. Approved chemical safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting.

**Prerequisites:** CHEM 5160

**CHEM 5170 Chemistry Instrumentation Techniques**
[2 credit hours (0, 2, 0)]
The study of advanced instrumentation techniques and structural determination of organic and inorganic compounds with an emphasis on pedagogical aspects of the techniques. Approved chemical safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting.

**Prerequisites:** CHEM 5160

**CHEM 5230 Chemistry of Sustainable Materials**
[4 credit hours (0, 0, 4)]
Applications of the principles of chemistry to understand the issues related to a sustainable energy future.

**CHEM 5300 Principles Of Analytical Chemistry**
[1-4 credit hours (0, 0, 1)]
Tutorial in selected topics in analytical chemistry. S/U grading only.

**Term Offered:** Fall

**CHEM 5400 Principles Of Organic Chemistry**
[1-4 credit hours (0, 0, 1)]
Tutorial in selected topics in organic chemistry. S/U grading only.

**Term Offered:** Summer, Fall

**CHEM 5500 Principles Of Biological Chemistry**
[1-4 credit hours (0, 0, 1)]
Tutorial in selected topics in biological chemistry. S/U grading only.

**Term Offered:** Fall

**CHEM 5600 Principles Of Inorganic And Organometallic Chemistry**
[1-4 credit hours (0, 0, 1)]
Tutorial in selected topics in inorganic and organometallic chemistry. S/U grading only.

**Term Offered:** Summer, Fall

**CHEM 5700 Principles Of Physical Chemistry**
[1-4 credit hours (0, 0, 1)]
Tutorial in selected topics in physical chemistry. S/U grading only.

**Term Offered:** Spring, Fall

**CHEM 5800 Principles Of Materials Chemistry**
[1-4 credit hours (0, 0, 1)]
Tutorial in selected topics in materials chemistry. S/U grading only.

**Term Offered:** Fall

**CHEM 6200 Green Chemistry**
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (4, 0, 0)]
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 (2, 1, 0)]
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 (4, 0, 0)]
a fundamental study of electrochemical concepts, methods, instrumentation and applications.

**Term Offered:** Spring

**CHEM 6330 Spectroscopic Methods And Analysis Of Spectra**
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
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 (0, 5, 0)]  
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 (4, 0, 0)]  
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 (4, 0, 0)]  
Important methodology and strategy in organic synthesis including disconnection and retrosynthetic analysis.  
Term Offered: Spring

CHEM 6430 Medicinal Chemistry  
[4 credit hours (4, 0, 0)]  
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 6500 Advanced Biological Chemistry  
[4 credit hours (4, 0, 0)]  
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 (4, 0, 0)]  
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  
Term Offered: Spring

CHEM 6520 Enzymology  
[4 credit hours (4, 0, 0)]  
Survey of current methods to study enzyme-catalyzed reactions, and application to examples from major enzyme, groups. Current topics in enzymology include azymes and ribozymes, artificial enzymes, and enzymes, and enzyme engineering.  
Term Offered: Spring

CHEM 6530 Nucleic Acid Chemistry  
[4 credit hours (4, 0, 0)]  
The structural and chemical properties of nucleic acids and the resulting biological consequences. Topics include: 3D structures, conformation, protein/nucleic acid interactions, physical properties and chemical reactions, mutagenesis, damage/repair, and recombination.  
Prerequisites: CHEM 6500  
Term Offered: Spring

CHEM 6540 Macromolecular Crystallography  
[2 credit hours (2, 0, 0)]  
Fundamental theory and practical application of X-ray diffraction to macromolecular structure determination, including protein crystallization and manipulation, data collection and reduction, phase solution, electron density interpretation, structural refinement and validation.  
Prerequisites: CHEM 6850  
Term Offered: Spring

CHEM 6550 Practical Protein Crystallography  
[2 credit hours (1, 3, 0)]  
Hands-on training in protein crystallography. Laboratory projects include: protein crystallization, crystal manipulation and mounting, X-ray diffraction data collection, data reduction, structure solution, electron density interpretation, refinement and cultural validation.  
Prerequisites: CHEM 6850  
Term Offered: Spring

CHEM 6570 Biophysical Chemistry  
[4 credit hours (4, 0, 0)]  
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.  
Term Offered: Fall

CHEM 6580 Bioinorganic Chemistry  
[4 credit hours (4, 0, 0)]  
Survey of biologically important metals and metal-ligand complexes, and the role of metal ions in proteins, metal ion transport and regulation, and metals in medicine.

CHEM 6600 Physical Inorganic Chemistry  
[4 credit hours (4, 0, 0)]  
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 (4, 0, 0)]  
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 6620 Chemistry of the Main Group Elements
[4 credit hours (4, 0, 0)]
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 6700 Advanced Physical Chemistry
[4 credit hours (4, 0, 0)]
Chemical systems and processes in the context of classical equilibrium thermodynamics. It introduces non-equilibrium and statistical thermodynamics to elucidate chemical changes and the connection between molecular and macroscopic system properties.
Term Offered: Fall

CHEM 6710 Quantum Chemistry and Spectroscopy
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
Advanced topics of current interest is physical chemistry. Examples of topics include nanomaterials science, spectroscopic techniques, or molecular modeling.
Term Offered: Spring, Fall

CHEM 6800 Advanced Materials Chemistry
[4 credit hours (4, 0, 0)]
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.
Term Offered: Spring

CHEM 6810 Materials Science I
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
A materials science approach to the thermodynamics of condensed state equilibria. Phase transformation kinetics.
Term Offered: Spring

CHEM 6850 X-Ray Crystallography
[4 credit hours (4, 0, 0)]
Term Offered: Fall

CHEM 6920 Chemistry Colloquium
[1-4 credit hours (0, 0, 0-2)]
Presentations on research or current literature.
Term Offered: Spring, Summer, Fall

CHEM 6930 Chemistry Seminar
[1-2 credit hours (0, 0, 0-1)]
Seminars conducted by individual members of the department.
Term Offered: Spring, Fall

CHEM 6940 Scientific Communication
[1-2 credit hours (1-2, 0, 0)]
Instructions on different modes of scientific communication: written communication, oral presentation, and research proposal, to enable students to think and converse competently in the language of science.
Term Offered: Spring, Fall

CHEM 6950 Thesis Research
[1-15 credit hours (0, 0, 0-15)]
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 6960 Graduate Professional Internship
[1-6 credit hours (0, 0, 1-6)]
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 (0-2, 0, 0)]
Discussions of newly developing areas in chemistry research.
Term Offered: Spring, Fall

CHEM 7300 Principles Of Analytical Chemistry
[1-4 credit hours (0, 0, 0-1)]
Tutorial in selected topics in analytical chemistry. S/U grading only.
Term Offered: Fall

CHEM 7400 Principles Of Organic Chemistry
[1-4 credit hours (0, 0, 0-1)]
Tutorial in selected topics in organic chemistry. S/U grading only.
Term Offered: Fall

CHEM 7500 Principles Of Biological Chemistry
[1-4 credit hours (0, 0, 0-1)]
Tutorial in selected topics in biological chemistry. S/U grading only.
Term Offered: Spring, Fall

CHEM 7600 Principles Of Inorganic And Organometallic Chemistry
[1-4 credit hours (0-1, 0, 0)]
Tutorial in selected topics in inorganic and organometallic chemistry. S/U grading only.
Term Offered: Fall

CHEM 7700 Principles Of Physical Chemistry
[1-4 credit hours (0-1, 0, 0)]
Tutorial in selected topics in physical chemistry. S/U grading only.
Term Offered: Fall

CHEM 7800 Principles Of Materials Chemistry
[1-4 credit hours (0, 0, 0-1)]
Tutorial in selected topics in materials chemistry. S/U grading only.
Term Offered: Fall
CHEM 8200 Green Chemistry
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (4, 0, 0)]
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 (2, 1, 0)]
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 (4, 0, 0)]
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 (4, 0, 0)]
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 (4, 0, 0)]
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 (0, 5, 0)]
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 (4, 0, 0)]
This course deals with chemical structure and reactivity correlations applied to the study of organic reaction mechanisms; stereoechemical 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, carbamions, and free radicals.
Term Offered: Fall

CHEM 8410 Organic Synthesis
[4 credit hours (4, 0, 0)]
Important methodology and strategy in organic synthesis including disconnection and retrosynthetic analysis.
Term Offered: Spring

CHEM 8430 Medicinal Chemistry
[4 credit hours (4, 0, 0)]
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 8500 Advanced Biological Chemistry
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
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 or CHEM 8500
Term Offered: Spring

CHEM 8520 Enzymology
[4 credit hours (4, 0, 0)]
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 8530 Nucleic Acid Chemistry
[4 credit hours (4, 0, 0)]
The structural and chemical properties of nucleic acids and the resulting biological consequences. Topics include: 3D structures, conformation, protein/nucleic acid interactions, physical properties and chemical reactions, mutagenesis, damage/repair, and recombination. Prerequisites: CHEM 6500 or CHEM 8500
Term Offered: Spring
CHEM 8540 Macromolecular Crystallography
[2 credit hours (2, 0, 0)]
Fundamental theory and practical application of X-ray diffraction to macromolecular structure determination, including protein crystallization and manipulation, data collection and reduction, phase solution, electron density interpretation, structural refinement and validation.
Prerequisites: CHEM 6850 or CHEM 8850
Term Offered: Spring

CHEM 8550 Practical Protein Crystallography
[2 credit hours (1, 3, 0)]
Hands-on training in protein crystallography. Laboratory projects include: protein crystallization, crystal manipulation and mounting, X-ray diffraction data collection, data reduction, structure solution, electron density interpretation, refinement and cultural validation.
Prerequisites: CHEM 8850
Term Offered: Spring

CHEM 8570 Biophysical Chemistry
[4 credit hours (4, 0, 0)]
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.
Term Offered: Fall

CHEM 8580 Bioinorganic Chemistry
[4 credit hours (4, 0, 0)]
Survey of biologically important metals and metal- ligand complexes, and the role of metal ions in proteins, metal ion transport and regulation, and metals in medicine.

CHEM 8600 Advanced Inorganic And Organometallic Chemistry
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
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 (4, 0, 0)]
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 8700 Advanced Physical Chemistry
[4 credit hours (4, 0, 0)]
Chemical systems and processes in the context of classical equilibrium thermodynamics. It introduces non-equilibrium and statistical thermodynamics to elucidate chemical changes and the connection between molecular and macroscopic system properties.
Term Offered: Fall

CHEM 8710 Quantum_Chemistry and Spectroscopy
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
Advanced topics of current interest is physical chemistry. Examples of topics include nanomaterials science, spectroscopic techniques, or molecular modeling.
Term Offered: Spring, Fall

CHEM 8800 Advanced Materials Chemistry
[4 credit hours (4, 0, 0)]
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.
Term Offered: Spring

CHEM 8810 Materials Science I
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
A materials science approach to the thermodynamics of condensed state equilibria. Phase transformation kinetics.
Term Offered: Spring

CHEM 8850 X-Ray Crystallography
[4 credit hours (4, 0, 0)]
Term Offered: Fall

CHEM 8920 Chemistry Colloquium
[1-4 credit hours (0, 0, 0-2)]
Presentations on research or current literature.
Term Offered: Spring, Summer, Fall

CHEM 8930 Chemistry Seminar
[1-2 credit hours (0, 0, 0-1)]
Seminars conducted by individual members of the Department.
Term Offered: Spring, Fall

CHEM 8940 Graduate Readings in Chemistry
[1 credit hour (0, 0, 1)]
Instructions on different modes of scientific communication: written communication, oral presentation, and research proposal to enable students to think and converse competently in the language of science.
Term Offered: Spring, Fall

CHEM 8960 Dissertation Research
[1-15 credit hours (0, 0, 0-15)]
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 (0, 0, 1-6)]
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.

CHEM 8980 Special Topics In Chemistry
[1-4 credit hours (0-2, 0, 0)]
Discussions of newly developing areas in chemistry research.
Term Offered: Spring, Fall
CIVIL ENGINEERING (CIVE)

CIVE 5210 Advanced Soil Mechanics
[3 credit hours (3, 0, 0)]
A study of soil behavior including stress distributions, deformation, consolidation and shear strength. The course focuses upon the development and use of well accepted solutions and practical applications.

CIVE 5240 Design With Geosynthetics
[3 credit hours (3, 0, 0)]
Use of geosynthetic materials in engineering design for reinforcement, barrier, separation and/or drainage functions. Design applications for geotechnical, transportation and environmental uses.

CIVE 5300 Advanced Mechanics Of Materials
[3 credit hours (3, 0, 0)]
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: Fall

CIVE 5320 Computer-Aided Analysis of Structures
[3 credit hours (3, 0, 0)]
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

CIVE 5340 Experimental Mechanics
[3 credit hours (0, 2, 2)]
Term Offered: Spring

CIVE 5430 Structural Steel Design II
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]

CIVE 5450 Bridge Design I
[3 credit hours (3, 0, 0)]
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 5480 Reinforced Masonry Design
[3 credit hours (3, 0, 0)]
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 5550 Traffic Control
[3 credit hours (0, 2, 2)]
To provide a detailed understanding of the basic concepts of traffic engineering together with driver-roadway-vehicle system characteristics. Capacity analysis of freeways, rural highways, multilane and two lane highways. Traffic control devices and traffic signal design and capacity. Traffic studies and data collections; volume, speed and travel time, accident and parking studies. Introduction to other tools to mitigate traffic congestion.
Term Offered: Fall

CIVE 5610 Water Resources And Hydrology
[3 credit hours (3, 0, 0)]
Term Offered: Spring

CIVE 5630 Indoor Air Quality
[3 credit hours (3, 0, 0)]
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 5650 Industrial Ventilation
[3 credit hours (3, 0, 0)]
Industrial ventilation as related to need of industrial hygiene engineer, including principles of air flow, natural and power ventilation, supply and exhaust, characteristics and design of systems, fans, collectors, testing instruments. Construction guidelines for local exhaust systems.

CIVE 5670 Solid Waste Management And Disposal
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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: Fall
CIVE 5690 Sustainability Engineering
[3 credit hours (3, 0, 0)]
Course develops students’ abilities to apply the principles of sustainability to engineered systems. 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 (3, 0, 0)]
A systematic approach to the analysis of complicated engineering systems involving uncertain and probabilistic phenomena. Decision-making with multiple objectives, Monte Carlo simulation, reliability-based design, and Markov process are studied.
Term Offered: Fall

CIVE 5930 Graduate Seminar In Civil Engineering
[1-3 credit hours (0-3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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: Fall

CIVE 6340 Mechanics Of Stability
[3 credit hours (3, 0, 0)]
Differential equations. Buckling of centrally and eccentrically loaded compression members; variational methods of determining critical loads; lateral and torsional buckling of beams; introduction to dynamic stability; parametric excitations; nonconservative stability problems; buckling of plates.

CIVE 6360 Dynamics Of Structures
[3 credit hours (3, 0, 0)]
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: Fall

CIVE 6460 Advanced Composite Materials In Infrastructure
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Structural behavior and failure modes of prestressed concrete structures; design in prestressed concrete, including long-span structures, bridges and precast systems.
Prerequisites: CIVE 5440
Term Offered: Spring, Fall

CIVE 6490 Nonlinear Modeling of Reinforced Concrete
[3 credit hours (3, 0, 0)]
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 and CIVE 6310 or CIVE 8310 or MIME 4280 or MIME 5280

CIVE 6630 Dispersion And Risk Modeling
[3 credit hours (3, 0, 0)]
Treatment of atmospheric dispersion problems, development of air quality models, components of a physical model, selection and evaluation of air pollution software, evaluation of models, risk modeling, EPA models and recent topics.

CIVE 6670 Physicochemical Processes for Water Quality Control
[3 credit hours (3, 0, 0)]
The course will discuss theories and designs for water treatment processes.
Term Offered: Fall

CIVE 6690 Dispersion Modeling Laboratory
[1 credit hour (0, 2, 0)]
Use of USEPA network, use of ten computer programs from the USEPA network, use of internet and environmental BBS, search for environmental data bases using search engines.
Prerequisites: CIVE 6630
Term Offered: Spring, Summer

CIVE 6900 Civil Engineering Problems
[3 credit hours (3, 0, 0)]
Special assignment of civil engineering problems of various types at the graduate level.
Term Offered: Spring, Summer, Fall

CIVE 6960 Graduate Research And Thesis - Masters
[1-9 credit hours (0, 0, 0-9)]
MS student should register their adviser’s section number.
Term Offered: Spring, Summer, Fall

CIVE 6980 Graduate Research And Project - Masters
[1-6 credit hours (0, 0, 0-6)]
MS student should register their adviser’s section number.
Term Offered: Spring, Summer, Fall
CIVE 6990 Special Topics - Independent Study
[1-3 credit hours (0, 0, 1-3)]
An opportunity for a qualified graduate student to pursue a relevant area of Civil and Environmental Engineering under the supervision of a faculty member. Course may be repeated.
Term Offered: Spring, Summer, Fall

CIVE 7340 Experimental Mechanics
[3 credit hours (0, 2, 2)]

CIVE 7430 Structural Steel Design II
[3 credit hours (3, 0, 0)]

CIVE 7450 Bridge Design I
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-6)]

CIVE 8280 Environmental and Geotechnical Engineering
[3 credit hours (3, 0, 0)]
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 modeling 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 (3, 0, 0)]
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: Fall

CIVE 8340 Mechanics Of Stability
[3 credit hours (3, 0, 0)]
Differential equations. Buckling of centrally and eccentrically loaded compression members; variational methods of determining critical loads; lateral and torsional buckling of beams; introduction to dynamic stability; parametric excitations; nonconservative stability problems; buckling of plates.

CIVE 8360 Dynamics Of Structures
[3 credit hours (3, 0, 0)]
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: Fall

CIVE 8460 Advanced Composite Materials In Infrastructure
[3 credit hours (3, 0, 0)]
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 8480 Prestressed Concrete Structures
[3 credit hours (3, 0, 0)]
Structural behavior and failure modes of prestressed concrete structures; design in prestressed concrete, including long-span structures, bridges and precast systems.
Prerequisites: CIVE 7440
Term Offered: Spring, Fall

CIVE 8490 Nonlinear Modeling of Reinforced Concrete
[3 credit hours (3, 0, 0)]
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 and CIVE 6310 or CIVE 8310 or MIME 4280 or MIME 5280

CIVE 8630 Dispersion And Risk Modeling
[3 credit hours (3, 0, 0)]
Treatment of atmospheric dispersion problems, development of air quality models, components of a physical model, selection and evaluation of air pollution software, evaluation of models, risk modeling, EPA models and recent topics.

CIVE 8670 Physicochemical Processes for Water Quality Control
[3 credit hours (3, 0, 0)]
The course will discuss theories and designs for water treatment processes.
Term Offered: Fall

CIVE 8690 Dispersion Modeling Laboratory
[1 credit hour (0, 2, 0)]
Use of USEPA network, use of ten computer programs from the USEPA network, use of Internet and environmental BBS, search for environmental data bases using search engines.
Prerequisites: CIVE 8630
Term Offered: Spring, Summer, Fall

CIVE 8900 Independent Problems
[1-6 credit hours (0-6, 0, 0)]
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 (0-6, 0, 0-16)]
Graduate research towards the completion of a Doctoral degree.
Term Offered: Spring, Summer, Fall
CIVE 8990 Special Topics - Independent Study
[1-3 credit hours (0, 0, 1-3)]
An opportunity for a qualified graduate student to pursue a relevant area of Civil and Environmental Engineering under the supervision of a faculty member.

Term Offered: Spring, Summer, Fall
COMMUNICATION (COMM)

COMM 6200 Communication Research Methods
[3 credit hours (0, 0, 3)]
Research methods, design and conventions in social scientific communication research including measurement, operationalizations, experimental and quasi-experimental design, analysis interpretation and reporting of findings, including quantitative and qualitative approaches.
Term Offered: Spring

COMM 6210 Principles And Practices Of Visual Communication
[3 credit hours (0, 0, 3)]
This course explores the influence of factors like color and design on human visual communication, the role of Gestalt principles, and the impact of various forms of visual communication.
Term Offered: Fall

COMM 6220 Communication, Technology, And Society
[3 credit hours (0, 0, 3)]
This course covers issues in communication technology including media, policy and strategic planning. Particular emphasis is given to the information revolution, communication industry development, and the marketplace for communication products.
Term Offered: Fall

COMM 6230 Communication, Propaganda And Persuasion
[3 credit hours (0, 0, 3)]
This seminar examines techniques of persuasion in social science research and applications and how this knowledge is used for the engineering of perception, mobilization and consent in organizations and society.
Term Offered: Spring

COMM 6240 Communication, Ethics And The Workplace
[3 credit hours (0, 0, 3)]
This course evaluates the impact of ethics on job performance, public perception of companies or agencies, and the ramifications of personal decision-making on the worker’s job satisfaction and long-range goals.

COMM 6260 Business, Communication And Technology
[3 credit hours (0, 0, 3)]
The course examines how organizations use media and communication strategies. Effective tools of communication to be studied include face-to-face interaction, dissemination of information through mass media, and communication through technologies.
Term Offered: Spring, Summer

COMM 6980 Special Topics In Communication Studies
[3 credit hours (0, 0, 3)]
Examination of emerging issues and topics in the field of communication. May be repeated for credit in different specialized topics.
Term Offered: Spring, Summer, Fall
CONTEMPORARY GERONTOLOGY PRACT (GERO)

GERO 5400 Health and Aging
[3 credit hours (3, 0, 0)]
This course is designed to investigate health-related issues in older adults. The psychosocial aspects of disability and disease will be explored. Practical application of material will be emphasized.
Term Offered: Fall

GERO 5410 Issues Contemp Gerontol Pract
[3 credit hours (3, 0, 0)]
Designed to explore introductory issues in older adults. Biological, psychological and sociological perspectives of aging will be addressed. Practical application of the material will be emphasized.
Term Offered: Fall

GERO 5420 Grief and Bereavement Issues
[3 credit hours (3, 0, 0)]
Grief and bereavement issues related to loss in later life will be explored. The role of the health care professional in facilitating the grief process will be introduced.
Term Offered: Spring

GERO 5430 Funding Adult Programming
[3 credit hours (0, 0, 0)]
Funding opportunities and resource generation for older adult programming will be introduced. Students will be taught basic needs assessment, grant writing and proposal development skills.
Term Offered: Spring

GERO 5440 Independent Study Gerontology
[3 credit hours (0, 0, 0)]
Intensive discipline specific study in geriatrics and gerontology, including theoretical and experimental work May be repeated for credit.
Term Offered: Spring, Summer, Fall
COUNSELING (COUN)

COUN 5010 Professional Orientation To School Counseling
[4 credit hours (4, 0, 0)]
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

COUN 5020 Professional Orientation to Clinical Mental Health Counseling
[4 credit hours (4, 0, 0)]
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, Fall

COUN 5110 Career Counseling And Development
[3 credit hours (3, 0, 0)]
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: Summer, Fall

COUN 5120 Individual And Group Assessment
[3 credit hours (3, 0, 0)]
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 (4, 0, 0)]
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.
Term Offered: Spring, Summer, Fall

COUN 5140 Counseling Theories And Techniques
[4 credit hours (4, 0, 0)]
Includes a study of basic counseling and consultation theories and helping relationships from individual, group, and systemic perspectives. Explores helper and helpee characteristics, sociocultural factors, and legal and ethical considerations. Includes supervised training in counseling and consulting skills and application of theories into counseling practices.
Term Offered: Spring, Summer, Fall

COUN 5150 Counseling Across The Life Span
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 5190 Counseling Practicum
[4 credit hours (0, 0, 4)]
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 5250 Creating Therapeutic Environments For The Aged
[3 credit hours (3, 0, 0)]
Explores the various aspects necessary for creating therapeutic physical and social psychological settings for older institutionalized adults. Models of care giving and programmatic skills are examined.

COUN 5980 Special Topics In Counseling, Mental Health, And School Psychology
[1-8 credit hours (0, 0, 1-8)]
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: Summer

COUN 6210 Psychopathology
[4 credit hours (4, 0, 0)]
The study of various paradigms for conceptualizing psychopathology related to children, adolescents and adults. Includes study of specific personality theories and their application to clinical counseling.
Term Offered: Spring
**COUN 6220 Child, Adolescent, Family Therapy**  
[3 credit hours (3, 0, 0)]  
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  
**Term Offered:** Summer, Fall

**COUN 6230 Crisis Intervention Counseling**  
[3 credit hours (3, 0, 0)]  
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  
**Term Offered:** Fall

**COUN 6240 Diagnosis And Mental Health**  
[4 credit hours (4, 0, 0)]  
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 6470 Drugs And Mental Health Counseling**  
[4 credit hours (4, 0, 0)]  
This course includes instruction on the neuroanatomy of the nervous system, the physiology of the neuron, and the processes involved in synaptic transmission. The psychobiological and psychophysiological effects of various psychotropic medications typically used in the treatment of mental disorder will be investigated. Integration of pharmacotherapy and psychotherapy in the treatment of mental, emotional, and substance use disorders will also be considered.  
**Term Offered:** Spring, Summer, Fall

**COUN 6500 Advanced Theory And Practice Of Career Counseling**  
[3 credit hours (3, 0, 0)]  
Advanced study in theories pertaining to the principles and practice of career counseling. Special emphasis on research, legal and ethical issues, and the role of culture in career choice and development.

**COUN 6720 Advocacy for the Survivor of Child Neglect and Abuse**  
[3 credit hours (0, 0, 3)]  
This course prepares students to recognize the long term cognitive, social, and emotional effects of child maltreatment. Evidence-based approaches for effective advocacy and for treatment of the survivor are examined.  
**Prerequisites:** SOCW 6700 and CRIM 6710  
**Term Offered:** Spring

**COUN 6920 Master’s Research Project**  
[1-3 credit hours (0, 0, 0-3)]  
In this capstone experience, master’s students review the literature, report implications and produce a project which can be applied in counseling-related settings. This can substitute for CMHS 6930.

**COUN 6930 Master’s Research Seminar**  
[2-3 credit hours (0, 0, 0-3)]  
In this capstone experience, master’s students review and critique the literature and report implications for research, theory and practice on counseling-related topic of interest, approved by the instructor.

**COUN 6940 Counseling Internship**  
[1-8 credit hours (0, 0, 0-16)]  
The course is intended to provide counseling students with practical experience in settings where counseling services are offered. It allows students to relate academic and theoretical learning to settings outside the classroom. Field placement also allows student to receive evaluative feedback on their knowledge, attitudes, and skills with clients in the school setting. Since students already have received advanced training in counseling, the staff and the clientele at the placement site should benefit from the services that are provided by students during the placement. Students are expected to assume a broad spectrum of counseling roles and functions. Students are asked to experience as many responsibilities as feasible in the school setting that are similar to the responsibilities of a professional counselor.  
**Prerequisites:** COUN 5190 or CMHS 5190  
**Term Offered:** Spring, Summer, Fall

**COUN 6950 Workshop In Counseling, Mental Health, And School Psychology**  
[1-6 credit hours (0, 0, 0-12)]  
Workshops developed around topics of interest and concern to counselors, school psychologists or other mental health care professionals. Practical application of topics will be stressed.

**COUN 6960 Master's Research Thesis**  
[1-3 credit hours (0, 0, 0-3)]  
In this capstone experience, master’s students complete an original piece of research, including literature review, methods, analysis and discussion. This can substitute for CMHS 6930.

**COUN 6990 Master's Independent Study**  
[1-4 credit hours (0, 0, 0-4)]  
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 7010 Professional Orientation To School Counseling**  
[4 credit hours (4, 0, 0)]  
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.

**COUN 7130 Group Counseling**  
[4 credit hours (4, 0, 0)]  
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.  
**Term Offered:** Spring, Summer, Fall
COUN 7140 Counseling Theories And Techniques
[4 credit hours (4, 0, 0)]
Includes a study of basic counseling and consultation theories and helping relationships from individual, group, and systemic perspectives. Explores helper and helpee characteristics, sociocultural factors, and legal and ethical considerations. Includes supervised training in counseling and consulting skills and application of theories into counseling practices.
Term Offered: Spring, Fall

COUN 7150 Counseling Across The Life Span
[3 credit hours (3, 0, 0)]
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 multigenerational family perspective.
Term Offered: Spring, Summer, Fall

COUN 7160 Cultural Diversity For Counselors And School Psychologists
[3 credit hours (3, 0, 0)]
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

COUN 7210 Psychopathology
[4 credit hours (4, 0, 0)]
This course is designed as an exploration into various conceptualizations of psychopathology and their implications for assessment, diagnosis, and treatment planning in counseling. The study of various paradigms for conceptualizing psychopathology related to children, adolescents and adults. Includes study of specific personality theories and their application to clinical counseling
Term Offered: Spring

COUN 7220 Child, Adolescent, Family Therapy
[3 credit hours (3, 0, 0)]
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
Term Offered: Summer, Fall

COUN 7230 Crisis Intervention Counseling
[3 credit hours (3, 0, 0)]
The Crisis Intervention Counseling course (COUN 6230) is designed to develop knowledge and skills in crisis intervention counseling associated with a variety of crisis situations. The course contributes to meeting the Council on Accreditation of Counseling and Related Educational Programs (CACREP) accreditation general

Prerequisites: COUN 5140
Term Offered: Fall

COUN 7240 Diagnosis And Mental Health
[4 credit hours (4, 0, 0)]
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 7510 Supervision In Counseling And School Psychology
[4 credit hours (4, 0, 0)]
Training in supervision models, methods, roles, ethical issues, research and evaluation. Advanced training in consultation.
Term Offered: Spring, Fall

COUN 7520 Education And Leadership In Mental Health Professions
[4 credit hours (4, 0, 0)]
Orient students to the roles and tasks of educators and leaders in mental health professions, curricular issues of programs, professional and ethical issues and current status and future trends in higher education among mental health professions.
Term Offered: Spring

COUN 7530 Advanced Theories Of Counseling And Consultation
[4 credit hours (4, 0, 0)]
This course is designed to provide advanced preparation in theory pertaining to the principles and practice of individual counseling, group work and consultation.
Term Offered: Fall

COUN 7540 Advanced Personality Assessment
[4 credit hours (4, 0, 0)]
This course will focus on the administration, scoring, and interpretation of selected advanced personality assessment instruments. Special emphasis will be given to the MMPI-2, NEO-PI-3, MCMI-III, SASSI-3, and report writing.
Prerequisites: COUN 5120
Term Offered: Fall

COUN 7930 Doctoral Research Seminar
[4 credit hours (4, 0, 0)]
Advanced preparation in research problems, design and implementation of quantitative and qualitative research and methodology in the fields of counseling and supervision.
Term Offered: Spring

COUN 8410 Advanced Practicum In Individual And Group Therapy
[4 credit hours (0, 0, 4)]
Students receive supervised, practical experiences in providing counseling in individual and group modes of services. Advanced therapy skills will be emphasized.
Term Offered: Spring
COUN 8420 Advanced Practicum In Family Therapy
[4 credit hours (0, 0, 4)]
This course is designed to provide specialized opportunity under live supervision to develop specialized skills in family therapy. The student will work in co-therapy with a family experiencing difficulties.

COUN 8440 Advanced Theory And Practice Of Group Counseling
[3 credit hours (3, 0, 0)]
Advanced training and experience in development, dynamics, theories, methods and skills of group counseling and therapy, leadership, research and evaluation and ethical issues as applicable to normal and abnormal populations.

COUN 8450 Couples And Family Therapy
[3 credit hours (3, 0, 0)]
Theories and practice of couples and family counseling are explored. Foundations of systems theories and their application to couples and family therapy are presented.
Prerequisites: (COUN 5140 and COUN 5150)
Term Offered: Spring

COUN 8460 Substance Abuse Counseling
[4 credit hours (4, 0, 0)]
Review of treatment approaches, techniques and programs for counseling individuals and families experiencing substance-related problems.
Term Offered: Spring, Fall

COUN 8470 Drugs And Mental Health Counseling
[4 credit hours (4, 0, 0)]
This course includes instruction on the neuroanatomy of the nervous system, the physiology of the neuron, and the processes involved in synaptic transmission. The psychobiological and psychophysiological effects of various psychotropic medications typically used in the treatment of mental disorder will be investigated. Integration of pharmacotherapy and psychotherapy in the treatment of mental, emotional, and substance use disorders will also be considered.
Term Offered: Spring, Summer

COUN 8480 Advanced Training In Professional, Legal, And Ethical Issues
[4 credit hours (0, 0, 4)]
The content of this course will consider advanced training in contemporary professional, legal, and ethical issues that influence, regulate, or affect the work of counselors, psychologists, and other mental health professionals.
Term Offered: Spring

COUN 8490 Gender Issues In Counseling And Mental Health Services
[3 credit hours (0, 0, 3)]
Examines the effect of gender role and related dynamics upon the psychological functioning of men and women and considers how these issues can be explored in counseling based upon an interactive model of gender roles emphasizing the learned nature of these characteristics.

COUN 8500 Advanced Theory And Practice Of Career Counseling
[3 credit hours (3, 0, 0)]
Advanced study in theories pertaining to the principles and practice of career counseling. Special emphasis on research, legal and ethical issues, and the role of culture in career choice and development.

COUN 8930 Advanced Doctoral Seminar
[3 credit hours (3, 0, 0)]
This seminar will consider problems and provide advanced study. Open only to advanced graduate students.

COUN 8940 Counseling Internship
[1-8 credit hours (0, 0, 0-16)]
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 or CMHS 5190
Term Offered: Spring, Summer, Fall

COUN 8950 Workshop In Counseling, Mental Health, And School Psychology
[1-6 credit hours (0, 0, 0-12)]
Workshops developed around topics of interest and concern to counselors, school psychologists, or other mental health care professionals. Practical application of topics will be stressed.

COUN 8960 Doctoral Research Dissertation
[1-12 credit hours (0, 0, 0-12)]
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

COUN 8980 Special Topics In Counseling, Mental Health, And School Psychology
[1-3 credit hours (0, 0, 0-3)]
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: Summer, Fall

COUN 8990 Doctoral Independent Study
[1-4 credit hours (0, 0, 0-4)]
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: Summer, Fall
CRIMINAL JUSTICE (CRIM)

CRIM 6000 Advanced Theories: Criminal Justice
[3 credit hours (3, 0, 0)]
This course critically examines contributions made by 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 (3, 0, 0)]
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 (3, 0, 0)]
This course is designed to provide students with the opportunity to integrate ethics in an understanding of criminal justice.
Term Offered: Summer

CRIM 6310 Juvenile Justice In The Metropolitan Community
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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: Fall

CRIM 6620 Police And Society
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-3)]
Field placement experience in an approved criminal justice agency to enhance the knowledge of the student.
Term Offered: Spring, Summer, Fall

CRIM 6960 Thesis
[1-6 credit hours (0, 0, 0-3)]
This course involves research leading to a written thesis. Both the topic of the research and the final thesis must be defended and approved by the student's thesis committee.

CRIM 6980 Special Topics In Criminal Justice
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-3)]
Directed study in criminal justice under the supervision of a criminal justice faculty member.
Term Offered: Spring, Summer, Fall
CURRIC AND INSTR: ERLY CHILDHD (CIEC)

CIEC 5000 Ece: Philosophy And Practice
[3 credit hours (3, 0, 0)]
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, Fall

CIEC 5070 Effective Teaching Practices: Pre-K To 3rd Grade
[3 credit hours (3, 0, 0)]
Applies characteristics of best practice to curriculum development and implementation with adherence to national and state curriculum standards as they apply to children, age 3 to 8, with diverse educational needs.
Prerequisites: (EDP 5210 and CIEC 5000)
Term Offered: Spring, Fall

CIEC 5150 Setting The Stage For Early Childhood Learning: Inspirations From Reggio Emilia
[3 credit hours (0, 0, 15)]
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 (3, 0, 0)]
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 (2.5, 0, 0)]
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
Term Offered: Spring, Fall

CIEC 5380 Field Experience Cohort I
[3 credit hours (0, 0, 8)]
This course aligns with the graduate Cohort II coursework (CIEC 5070).
Prerequisites: EDP 5210
Corequisites: CIEC 5070
Term Offered: Spring, Fall

CIEC 5460 Science Methods For Early Childhood Education
[3 credit hours (3, 0, 0)]
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 discoveries. Students will learn how to assess the scientific thinking of young children appropriately, using formal and informal strategies.
Term Offered: Spring, Fall

CIEC 5480 Field Experience Cohort II
[3 credit hours (3, 0, 0)]
This course aligns with all graduate-level Cohort II coursework in the early childhood teacher education licensure program.
Corequisites: CIEC 5460
Term Offered: Spring, Fall

CIEC 5520 Multisensory Experiences
[3 credit hours (3, 0, 0)]
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 5530 Affective Experiences
[3 credit hours (3, 0, 0)]
This course focuses on teacher planning and activities that support the socio-emotional development of young children.

CIEC 5540 Prekindergarten Programs
[3 credit hours (3, 0, 0)]
Focuses on the successful operations of an early childhood program. Covers topics such as licensing and certification standards, staff development selection and purchase of equipment and proper food and health services.

CIEC 5550 Teaching Methods For Early Childhood Social Studies
[3 credit hours (2.5, 0, 0)]
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 5000 and EDP 5210)
Term Offered: Spring, Fall

CIEC 5580 Practicum: Infant/Toddler
[1 credit hour (0, 0, 4)]
Practicum experience in infant/toddler settings where students will observe, plan, implement and evaluate activities.

CIEC 5590 Infant Toddler/Seminar
[2 credit hours (0, 0, 2)]
Planning, research, teacher-made materials appropriate for environments for infants and toddlers will be covered.
CIEC 5610 Seminar I: Orientation to Interprofessional Teaming  
[1 credit hour (0, 0, 1)]  
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 5270  
**Term Offered:** Summer  

CIEC 5620 Seminar II: Working Effectively with Team Members  
[1 credit hour (0, 0, 1)]  
Factors that support and threaten interprofessional collaboration. Become aware of policies affecting teaming. Engage in advocacy for teaming that will benefit individuals with disabilities.  
**Prerequisites:** CIEC 5610 and CIEC 5270  
**Term Offered:** Summer  

CIEC 5630 Seminar III: Evidence-Based Practice and Innovation in Teaming  
[1 credit hour (0, 0, 1)]  
Issues related to principles of ethical practice, professional identity and advocacy. Ways in which technology can promote effective teaming practices with other professionals as well as with family members.  
**Prerequisites:** CIEC 5620  
**Corequisites:** CIEC 5640  
**Term Offered:** Summer  

CIEC 5640 Practicum in Interprofessional Teaming  
[2 credit hours (0, 0, 2)]  
Students will work as part of an inter-professional team to develop, implement, and evaluate integrated intervention plans designed to support the development of children who have special needs.  
**Prerequisites:** CIEC 5620  
**Corequisites:** CIEC 5630  

CIEC 5770 Field Experience Cohort III  
[3 credit hours (0, 0, 8)]  
This course aligns with all Cohort III coursework in the early childhood education program.  
**Prerequisites:** (CIEC 5070 and EDP 3210) or (CIEC 5070 and EDP 5210) or (CIEC 4070 and EDP 3210)  
**Term Offered:** Spring, Fall  

CIEC 5800 Teacher/Parent Child Relations  
[3 credit hours (3, 0, 0)]  
This course is designed to assist the classroom teacher in building positive relationships with the parents of students and to develop effective strategies for communicating with them.  

CIEC 5950 Workshop In Early Childhood Education  
[1-5 credit hours (0, 0, 0-3)]  
Workshops developed around topics of interest and concern to inservice teachers. Practical application of workshop topics will be emphasized. Students may include several workshops in their master’s or specialist degree programs.  

CIEC 5980 Special Topics In Early Childhood Education  
[1-5 credit hours (0-5, 0, 0)]  
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, Fall  

CIEC 5990 Graduate Independent Study In Early Childhood Education  
[1-5 credit hours (0, 0, 0-5)]  
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 (3, 0, 0)]  
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 (3, 0, 0)]  
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:** Summer  

CIEC 6330 Language And Concept Development  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
Focuses upon teaching and learning in a developmental learning environment. Emphasizes 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 (0, 0, 0-3)]  
Examination of research and current issues in early childhood education. Emphasis on theory and research and evaluation models.  
**Prerequisites:** CIEC 6950  
**Term Offered:** Spring  

CIEC 6920 Masters Research Project In Early Childhood Education  
[1-3 credit hours (0, 0, 0-3)]  
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 In Early Childhood  
[1-12 credit hours (0, 0, 0-12)]  
Placement of a Master’s student in an appropriate PreK-Grade 3 school setting under the direction of a CIEC instructor. A maximum of 3 hours can be applied towards a masters degree.  
**Term Offered:** Spring, Fall
CIEC 6950 Theory And Research In Early Childhood
[3 credit hours (3, 0, 0)]
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 6960 Masters Thesis In Early Childhood Education
[1-3 credit hours (0, 0, 0-3)]
Students who elect this option will complete a thesis under the direction of committee of at least two faculty members from Early Childhood Education, ordinarily including the faculty advisor.

CIEC 7610 Seminar I: Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
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
Term Offered: Summer

CIEC 7620 Seminar II: Working Effectively with Team Members
[1 credit hour (0, 0, 1)]
Factors that support and threaten interprofessional collaboration. Become aware of policies affecting teaming. Engage in advocacy for teaming that will benefit individuals with disabilities.
Prerequisites: CIEC 7610 and CIEC 7270
Term Offered: Summer

CIEC 7630 Seminar III: Evidence-Based Practice and Innovation in Teaming
[1 credit hour (0, 0, 1)]
Issues related to principles of ethical practice, professional identity and advocacy. Ways in which technology can promote effective teaming practices with other professionals as well as with family members.
Prerequisites: CIEC 7620
Corequisites: CIEC 7640
Term Offered: Spring, Summer

CIEC 7640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
Students will work as part of an inter-professional team to develop, implement, and evaluate integrated intervention plans designed to support the development of children who have special needs.
Prerequisites: CIEC 7620
Corequisites: CIEC 7630

CIEC 7800 Teacher/Parent Child Relations
[3 credit hours (3, 0, 0)]
This course is designed to assist the classroom teacher in building positive relationships with the parents of students and to develop effective strategies for communicating with them.

CIEC 7940 Specialist Practicum In Early Childhood Education
[1-3 credit hours (0, 0, 0-3)]
Observation and supervised experience in an appropriate setting. Students will be assigned to work as interns under the joint supervision of school and University personnel.

CIEC 7980 Special Topics In Early Childhood Education
[1-5 credit hours (0-5, 0, 0)]
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 8310 Pre-K/Primary Curriculum
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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: Summer

CIEC 8330 Language And Concept Development
[3 credit hours (3, 0, 0)]
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 8340 Curriculum Design For Infants And Toddlers
[3 credit hours (3, 0, 0)]
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: Summer

CIEC 8350 Development And Classroom Assessment
[3 credit hours (0, 0, 3)]
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 8750 Developmental And Classroom Assessment
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-4)]
This seminar will consider problems and provide advanced study for doctoral students in Early Childhood Education.
Term Offered: Fall

CIEC 8930 Independent Research In Early Childhood Education
[1-5 credit hours (0, 0, 0-5)]
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 8940 Doctoral Internship In Early Childhood
[1-3 credit hours (0, 0, 0-3)]
Placement of doctoral students in an appropriate PreK-Grade 3 school, school district or other professional setting under the direction of joint placement personnel and CIEC faculty.
**Term Offered:** Spring

CIEC 8950 Theory And Research In Early Childhood
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-12)]
Original research in an area of early childhood education.
**Term Offered:** Spring, Summer, Fall
CI 5120 Developing Instruction in Mathematics and Science for Grades 4-5
[3 credit hours (0, 0, 3)]
A course in pedagogy and content for pre-service teachers currently working on Ohio's Early Childhood PK-3 LAMP licensure program and licensed teachers who have completed Ohio's PK-3 licensure program and are seeking to extend their license to be eligible to teach all content in grades four and five. The course will focus on the mathematics and science outlined in Ohio's standards for teaching mathematics and science in grades 4 and 5.
Term Offered: Fall

CI 5190 Secondary Field Experience II
[3 credit hours (0, 0, 12)]
Field experience for alternative 712 certification. Classroom observations and reports. Teach series of lessons or unit of study in secondary classroom. Students will develop and implement a unit plan in the content area integrating teaching of content, thinking skills and adjusting the unit to a special needs population.
Term Offered: Fall

CI 5300 Literature For Children
[3 credit hours (3, 0, 0)]
Emphasis on all genres of literature for children, including poetry, traditional literature, fantasy, realistic fiction, biography and other information books, particularly for early childhood and middle grades learners. Instructional strategies for engaging learners with children's literature and ways of increasing home-school connections through use of children's literature also introduced.

CI 5320 Literature For Young Adults
[3 credit hours (3, 0, 0)]
Survey of literature materials written for the junior and senior high school student. Emphasis is placed on all genres, literary elements and uses of literature across the curriculum.
Term Offered: Spring, Fall

CI 5360 Multicultural Literature
[3 credit hours (3, 0, 0)]
Picture books, fiction, biography and poetry appropriate for elementary and middle school students that interpret and reflect honestly the lives of persons of color will be studied and evaluated.
Term Offered: Fall

CI 5430 Issues In Second Language Instruction
[3 credit hours (3, 0, 0)]
A critical study of teaching foreign languages and English as a second language across age groups including current theories, curriculum, materials, teaching strategies and assessment.
Term Offered: Spring

CI 5470 Literacy Assessment and Remediation
[3 credit hours (3, 0, 0)]
Examine current 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. Apply word identification, comprehension, fluency, vocabulary and writing instructional strategies for supporting readers in an experiential learning environment.
Term Offered: Spring, Summer, Fall

CI 5490 Content Area Reading For Adolescent Young Adult, Multi-Age, And Career And Technical Education Teach
[3 credit hours (3, 0, 0)]
Study of the integration of reading comprehension, writing, oral language and word skill development in content reading. Attention will be given to instructional methods as well as assessment practices.
Term Offered: Summer, Fall

CI 5510 Mathematics For The Young Child
[3 credit hours (3, 0, 0)]
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 5530 TEACHING AND LEARNING GEOMETRY AND MEASUREMENT
[3 credit hours (3, 0, 0)]
Examination of the development of mathematics concepts and skills across the K-12 curriculum. Discussion of mathematics content, teaching methods, instructional materials, assessment techniques and applications to classroom practice.
Term Offered: Spring

CI 5540 Teaching and Learning Algebra
[3 credit hours (3, 0, 0)]
Examination of the development of algebraic concepts and skills across the K-12 curriculum. Emphasis on current research, theory, and innovative approaches for teaching and learning algebra.
Term Offered: Fall

CI 5550 Teaching Problem Solving In Mathematics
[3 credit hours (3, 0, 0)]
Focuses on the art of problem solving and methods and materials for classroom implementation. Consideration given to current trends and related resource regarding use of problem solving in mathematics teaching.
Term Offered: Fall

CI 5560 ASSESSMENT IN MATHEMATICS EDUCATION
[3 credit hours (3, 0, 0)]
Study of the role of assessment in the teaching and learning of mathematics. Examination of current research, assessment techniques, and trends and ways in which assessment can guide and inform mathematics instruction.
Term Offered: Fall

CI 5580 TEACHING AND LEARNING NUMBER, DATA, AND PROBABILITY
[3 credit hours (3, 0, 0)]
Examination of the development of concepts and skills associated with number, data, and probability across the K-12 curriculum. Emphasis on current research, theory, and innovative instructional approaches.
CI 5590 Topics in Mathematics Education  
[3 credit hours (0, 0, 3)]  
Examination and exploration of policy issues, research, and national trends that have implications for teachers, curriculum specialists, school districts, and others involved in mathematics education  
Term Offered: Summer, Fall  

CI 5640 Environmental Education  
[3 credit hours (3, 0, 0)]  
An experiential course for those interested in developing their knowledge and expertise in Environmental Education. Participants will develop a personal response to current environmental issues and learn how to help others do the same. Participants include teachers, naturalists, environmental science professionals and anyone interested in environmental education. The course will take a practical approach to the NAEE standards for environmental and conservation education as well as the NGSS and relevant Common Core State Standards.  

CI 5650 Mentoring a Preservice Teacher  
[3 credit hours (0, 0, 3)]  
Designed for practicing teachers, this course explores the role of a mentor teacher in guiding prospective teachers in learning to teach. Emphasis is on developing productive mentor-mentee relationships; guiding planning, teaching and assessment; providing useful feedback; and assessing preservice teacher learning.  

CI 5660 Technological Tools In Science Education  
[3 credit hours (0, 0, 2.5)]  
Designed for science educators, this course explores the use of learning technologies for teaching and learning science. Students investigate theoretical frameworks for thinking about tools to support science learning and the role of technology in science education. This course explores technologies to extend students’ capabilities at inquiry and enhance their thinking about science phenomena, how technologies can enhance learning within and beyond classrooms, and how technologies support and change science teachers’ work with learners.  
Term Offered: Spring  

CI 5690 Project-Based Science  
[3 credit hours (0, 0, 3)]  
Advanced methods for teaching science to engage learners in extended inquiry as they investigate real-world questions. Emphasis on innovative instructional strategies, research and theoretical perspectives to promote deep understanding of fundamental concepts.  
Term Offered: Spring  

CI 5810 Instructional Strategies  
[3 credit hours (3, 0, 0)]  
This course examines the purposes and practices of effective teachers. Participants critically investigate different instructional models for teaching including mediated instruction, discussion, inquiry management, project-based instruction, cooperative learning and the use of technology. Many different teaching methodologies will be demonstrated, modeled and critically examined. Participants will draft a personal philosophy of education. Focus is firmly placed on individual student learning outcomes in a climate of increasing diversity in the 21st century.  
Term Offered: Spring, Summer, Fall  

CI 5870 Secondary School Curriculum  
[3 credit hours (3, 0, 0)]  
A critical exploration of secondary school curricular issues, trends, and practices including the historical, political, social, psychological, and philosophical traditions. Participants examine how secondary curriculum is developed, implemented and institutionalized. Emphasis will be placed on topics including teacher leadership, collaboration, action research, and reflective decision making in curriculum work. This course is for teachers, administrators, and anyone interested in how curriculum has influenced educational reform and can influence future reform.  
Term Offered: Spring  

CI 5980 Special Topics In Curriculum & Instruction  
[1-5 credit hours (0, 0, 0-3)]  
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 (0, 0, 0)]  
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 (3, 0, 0)]  
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 (3, 0, 0)]  
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 (3, 0, 0)]  
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 (3, 0, 0)]
An initial in-depth study of methods and materials for teaching and learning Science in middle and secondary classrooms with an 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 6240
Term Offered: Fall

CI 6150 Advanced Methods of Teaching in Language Arts
[3 credit hours (3, 0, 0)]
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 or CI 6120 or CI 6130 or CI 6140
Corequisites: CI 6250
Term Offered: Spring

CI 6160 Social Studies Advanced Methods of Teaching
[3 credit hours (3, 0, 0)]
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 or CI 6120 or CI 6130 or CI 6140
Corequisites: CI 6260
Term Offered: Spring

CI 6170 Mathematics Advanced Methods of Teaching
[3 credit hours (3, 0, 0)]
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 or CI 6120 or CI 6140 or CI 6130
Corequisites: CI 6270
Term Offered: Spring

CI 6180 Science Advanced Methods of Teaching
[3 credit hours (3, 0, 0)]
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 or CI 6130 or CI 6140
Corequisites: CI 6280
Term Offered: Spring

CI 6210 Language Arts Practicum of Teaching
[3 credit hours (0, 0, 3)]
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 Social Studies Practicum
[3 credit hours (0, 0, 3)]
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 Mathematics Practicum
[3 credit hours (0, 0, 3)]
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 Science Practicum
[3 credit hours (0, 3, 0)]
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 Language Arts Internship and Student Teaching
[3 credit hours (0, 0, 3)]
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 or CI 6220 or CI 6230 or CI 6240
Corequisites: CI 6150
Term Offered: Spring

CI 6260 Social Studies Student Teaching and Internship
[3 credit hours (0, 0, 3)]
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 or CI 6220 or CI 6230 or CI 6240
Corequisites: CI 6160
Term Offered: Spring
CI 6270 Mathematics Student Teaching and Internship
[3 credit hours (0, 0, 3)]
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 or CI 6220 or CI 6230 or CI 6240
Corequisites: CI 6170
Term Offered: Spring

CI 6280 Science Student Teaching and Internship
[3 credit hours (0, 0, 3)]
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 or CI 6220 or CI 6230 or CI 6240
Corequisites: CI 6170
Term Offered: Spring

CI 6370 Fundamentals Of Grant Writing
[3 credit hours (3, 0, 0)]
This seminar will teach participants about fundamentals of grant writing. Topics covered will include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.
Term Offered: Summer

CI 6400 Trends In Literacy Acquisition
[3 credit hours (0, 0, 3)]
Study of the theories and foundational components of literacy instruction. Factors affecting literacy development including oral language, phonemic awareness, phonics, fluency, comprehension, vocabulary, reading-writing connections and motivation considered. Issues for learners from diverse backgrounds including English Language Learners examined.
Term Offered: Spring, Summer, Fall

CI 6410 Content Area Literacy
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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
Term Offered: Spring, Summer, Fall

CI 6440 Remediation Practicum
[3 credit hours (0, 0, 3)]
In depth tutoring with learners ranging from preK to 12th grade. Data-driven instructional decision-making as well as considerations for individualizing instruction emphasized. Design and conduct of a professional development workshop for literacy educators based on tutoring cases is a culminating aspect of the course.
Prerequisites: (CI 6400 and CI 6430)
Term Offered: Spring, Summer, Fall

CI 6490 Theory And Research In Literacy
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 6790 Theory And Research In Social Studies
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Designed for educators, 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 professional literature.
Term Offered: Spring, Summer, Fall

CI 6840 Curriculum For Educational Leaders
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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: Summer

CI 6900 Masters Research Seminar In Curriculum And Instruction
[2-3 credit hours (2-3, 0, 0)]
Graduate seminar designed as a culminating experience in the master’s programs in Curriculum and Instruction. Participants critically examine the research and scholarship in their specific field of interest. Emphasis is placed on professional academic collaboration, peer review, constructive criticism. The final product of this seminar is an academic manuscript of publishable quality that contributes to the academic discourse in a particular body of scholarship.
Prerequisites: CI 6490 or CI 6590 or CI 6690 or CI 6790 or CI 6890 or CIEC 6950
Term Offered: Spring, Summer, Fall

CI 6920 Masters Research Project In Curriculum And Instruction
[1-3 credit hours (0, 0, 0)]
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 Student Teaching and Internship: LAMP
[3 credit hours (0, 0, 3)]
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 or CI 6260 or CI 6270 or CI 6280 and CI 6150 or CI 6160 or CI 6170 or CI 6180
Term Offered: Spring, Summer

CI 6960 Masters Thesis In Curriculum And Instruction
[1-3 credit hours (0, 0, 0)]
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

CI 7530 TEACHING AND LEARNING GEOMETRY AND MEASUREMENT
[3 credit hours (3, 0, 0)]
Examination of the development of mathematics concepts and skills associated with geometry and measurement across the K-12 curriculum. Emphasis on current research, theory, and innovative instructional approaches to the teaching and learning of geometry and measurement.
Term Offered: Spring

CI 7540 Teaching and Learning Algebra
[3 credit hours (3, 0, 0)]
Examination of the development of algebraic concepts and skills across the K-12 curriculum. Emphasis on current research, theory, and innovative approaches for teaching and learning algebra.
Term Offered: Fall

CI 7560 ASSESSMENT IN MATHEMATICS EDUCATION
[3 credit hours (3, 0, 0)]
Study of the role of assessment in the teaching and learning of mathematics. Examination of current research, assessment techniques, and trends and ways in which assessment can guide and inform mathematics instruction.
Term Offered: Fall

CI 7580 TEACHING AND LEARNING NUMBER, DATA, AND PROBABILITY
[3 credit hours (3, 0, 0)]
Examination of the development of concepts and skills associated with number, data, and probability across the K-12 curriculum. Emphasis on current research, theory, and innovative instructional approaches.

CI 7590 Topics in Mathematics Education
[3 credit hours (0, 0, 3)]
Examination and exploration of policy issues, research, and national trends that have implications for teachers, curriculum specialists, school districts, and others involved in mathematics education.
Term Offered: Fall

CI 7650 Mentoring a Preservice Teacher
[3 credit hours (0, 0, 3)]
Designed for practicing teachers, this course explores the role of a mentor teacher in guiding prospective teachers in learning to teach. Emphasis is on developing productive mentor-mentee relationships; guiding planning, teaching and assessment; providing useful feedback; and assessing preservice teacher learning.
CI 7660 Technological Tools In Science Education  
[3 credit hours (0, 0, 2.5)]  
Designed for science educators, this course explores the use of learning technologies for teaching and learning science. Students investigate theoretical frameworks for thinking about tools to support science learning and the role of technology in science education. This course explores technologies to extend students’ capabilities at inquiry and enhance their thinking about science phenomena, how technologies can enhance learning within and beyond classrooms, and how technologies support and change science teachers’ work with learners.  
Term Offered: Spring  

CI 7690 Project-Based Science  
[3 credit hours (3, 0, 0)]  
Advanced methods for teaching science to engage learners in extended inquiry as they investigate real-world questions. Emphasis on innovative instructional strategies, research and theoretical perspectives to promote deep understanding of fundamental concepts.  
Term Offered: Spring, Summer  

CI 7810 Instructional Strategies  
[3 credit hours (3, 0, 0)]  
This course examines the purposes and practices of effective teachers. Participants critically investigate different instructional models for teaching including mediated instruction, discussion, inquiry management, project-based instruction, cooperative learning and the use of technology. Many different teaching methodologies will be demonstrated, modeled and critically examined. Participants will draft a personal philosophy of education. Focus is firmly placed on individual student learning outcomes in a climate of increasing diversity in the 21st century.  
Term Offered: Spring, Summer, Fall  

CI 7870 Secondary School Curriculum  
[3 credit hours (3, 0, 0)]  
A critical exploration of secondary school curricular issues, trends, and practices including the historical, political, social, psychological, and philosophical traditions. Participants examine how secondary curriculum is developed, implemented and institutionalized. Emphasis will be placed on topics including teacher leadership, collaboration, action research, and reflective decision making in curriculum work. This course is for teachers, administrators, and anyone interested in how curriculum has influenced educational reform and can influence future reform.  
Term Offered: Spring  

CI 7940 Specialist Practicum In Curriculum And Instruction  
[1-3 credit hours (0, 0, 0)]  
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 (0, 0, 0-5)]  
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 (3, 0, 0)]  
This seminar will teach participants about fundamentals of grant writing. Topics covered will include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.  
Term Offered: Summer  

CI 8400 Trends In Literacy Acquisition  
[3 credit hours (0, 0, 3)]  
Study of the theories and foundational components of literacy instruction. Factors affecting literacy development including oral language, phonemic awareness, phonics, fluency, comprehension, vocabulary, reading-writing connections and motivation considered. Issues for learners from diverse backgrounds including English Language Learners examined.  
Term Offered: Spring, Summer, Fall  

CI 8410 Content Area Literacy  
[3 credit hours (0, 0, 3)]  
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 (0, 0, 3)]  
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  

CI 8440 Remediation Practicum  
[3 credit hours (0, 0, 3)]  
In depth tutoring with learners ranging from preK to 12th grade. Data-driven instructional decision-making as well as considerations for individualizing instruction emphasized. Design and conduct of a professional development workshop for literacy educators based on tutoring cases is a culminating aspect of the course.  
Prerequisites: (CI 6400 and CI 6430)  
Term Offered: Spring, Summer, Fall  

CI 8490 Theory And Research In Literacy  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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 (3, 0, 0)]  
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 6890 Theory And Research In Science Education
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
The doctoral research cycle begins by introducing students to issues in curriculum and instruction, establishing a research agenda, and building a community of scholars. Prerequisite 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 (0, 0, 3)]
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
Term Offered: Spring, Summer

CI 8720 Doctoral Pro-Seminar III: Themes in theory and research in curriculum and instruction.
[3 credit hours (0, 0, 3)]
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
Term Offered: Spring, Summer, Fall

CI 8790 Theory And Research In Social Studies
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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

CI 8840 Curriculum For Educational Leaders
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0-2)]
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 (0, 0, 0)]
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 (0, 0, 0-12)]
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 (0, 0, 0)]
Original research in an area of curriculum and instruction.
Term Offered: Spring, Summer, Fall
DENTISTRY - ORAL BIOLOGY (DENT)

DENT 6010 Growth and Development
[0.5 credit hours (0.5, 0, 0)]
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 (0.5, 0, 0)]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, expected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Fall

DENT 6030 Dento-alveolar Trauma I
[0.5 credit hours (0.5, 0, 0)]

DENT 6040 Conscious Sedation I
[2 credit hours (2, 0, 0)]
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 credit hours (0.5, 0, 0)]
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: Summer, Fall

DENT 6060 Principles of Behav/Comm Mgmt
[2 credit hours (2, 0, 0)]
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 (0.5, 0, 0)]
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 (1, 0, 0)]
Lecture and discussion of select topics in gross anatomy and embryology.
Term Offered: Spring

DENT 6090 Concepts - Dental Microbiology
[0.5 credit hours (0.5, 0, 0)]

DENT 6100 Pediatric Medicine Lecture
[2 credit hours (2, 0, 0)]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, expected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Spring, Summer, Fall

DENT 6110 Oral Health Policies
[2 credit hours (2, 0, 0)]

DENT 6120 Pharmacology II
[0.5 credit hours (0.5, 0, 0)]
Advanced pharmacologic principles in decision making for dental pharmacotherapy. Emphasis is on physiological responses to drugs, expected outcomes, adverse reactions, and potential drug interactions.
Term Offered: Spring

DENT 6130 Dento-alveolar Trauma II
[0.5 credit hours (0.5, 0, 0)]

DENT 6140 Conscious Sedation
[2 credit hours (2, 0, 0)]
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

DENT 6150 Amer Board of Pediatric Dent RE
[2 credit hours (2, 0, 0)]

DENT 6160 Special Care Dentistry
[1 credit hour (1, 0, 0)]
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, hemoglobinopathies, 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 (0, 0, 1-10)]
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 (1, 0, 0)]
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
EEES 5100 Advanced Glacial Geology  
[3 credit hours (3, 0, 0)]  
To understand glaciers and glacial landscapes. Topics include mass balance, ice flow, hydrology, erosion, deposition, landforms, glacial lakes and development of the Ohio glacial landscape. Field trip is mandatory.  
Prerequisites: EEES 3100  
Term Offered: Spring

EEES 5150 Organic Evolution  
[3 credit hours (3, 0, 0)]  
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  
[3 credit hours (3, 0, 0)]  
A course in data management for environmental science graduate students covering the basics of data management practices and the use of Excel and R for data preparation, evaluation, analysis, visualization, and interpretation.  
Term Offered: Fall

EEES 5200 Advanced Quaternary Geology  
[3 credit hours (3, 0, 0)]  
To provide understanding of such cyclical events as climate change, sea level fluctuations, vegetation change and ice sheet paleogeography during the Quaternary Period and to explore future changes for planet Earth.  
Term Offered: Spring

EEES 5220 Environmental Geochemistry  
[3 credit hours (3, 0, 0)]  
Chemical reactions of environmental concern. Water and soil chemistry related to contaminant fate and mobility. Computer software used.  
Term Offered: Spring, Fall

EEES 5240 Soil Science  
[3 credit hours (3, 0, 0)]  
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

EEES 5250 Soil Ecology  
[3 credit hours (3, 0, 0)]  
Underlying concepts and theory of modern soil ecology will be reviewed including the biogeochemical cycles and ecological functions of soil, and the effects of human activities. (Spring, alternate years, odd)  
Prerequisites: (BIOL 3050 and EEES 4240) or (BIOL 3050 and EEES 5240)  
Term Offered: Spring, Fall

EEES 5260 Soil Ecology Laboratory  
[1 credit hour (0, 3, 0)]  
Laboratory exercises designed to complement the material covered in EEES 5250.  
Corequisites: EEES 5250  
Term Offered: Spring

EEES 5350 Ecology and Conservation of Reptiles and Amphibians  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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 or MATH 1850 or MATH 1830 or MATH 1920  
Term Offered: Spring

EEES 5450 Hazardous Waste Management  
[3 credit hours (3, 0, 0)]  
Environmental regulations concerning hazardous waste, characteristics of hazardous waste and disposal technologies, toxicology, characteristics of organic chemicals and heavy metals, biodegradation, soil science, groundwater contamination, risk assessment, site investigation.  
Term Offered: Fall

EEES 5480 GIS Applications in ENSC  
[3 credit hours (3, 0, 0)]  
An applications course focused on using GIS techniques and applications in environmental problems and research.  
Term Offered: Spring, Fall

EEES 5490 Remote Sensing of the Environment  
[4 credit hours (0, 0, 4)]  
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 and EEES 2100  
Term Offered: Fall

EEES 5510 Environmental Microbiology  
[3 credit hours (3, 0, 0)]  
Microbial diversity and activities in an applied environmental context. Topics include function of microbial ecosystems in energy and carbon flow, bioremediation, and the detection and control of pathogens.  
Prerequisites: (EEES 2150 and CHEM 1230)  
Term Offered: Fall
EEES 5520 Bioremediation
[3 credit hours (3, 0, 0)]
The environmental fate and transport of contaminants; their transformation and biodegradation by plants and microorganisms; bioremediation strategies, including solid phase, slurry phase and vapor-phase treatments, and natural attenuation.

EEES 5540 Advanced Microbial Ecology
[3 credit hours (3, 0, 0)]
An advanced course focusing on the ecology and public health role of microbes with emphasis on the epidemiology of infectious disease outbreaks.

Term Offered: Fall

EEES 5550 Advanced Methods Of Microbial Investigation
[3 credit hours (0, 3, 0)]
Student will learn the classical and current methodologies (biochemical and molecular) used in microbial community analysis while developing an understanding of experimental design sample handling and data analysis.

Prerequisites: EEES 5540

EEES 5610 Solid Earth Geophysics
[3 credit hours (2, 3, 0)]
Survey of theory, field applications, interpretation principles of solid earth and exploration geophysics. Two hours lecture, three hours methods laboratory.

Prerequisites: (PHYS 2070 and PHYS 2080 and MATH 1850 and MATH 1860)

Term Offered: Spring, Fall

EEES 5630 Numerical Methods In Geophysics
[3 credit hours (2, 2, 0)]
Numerical filters and matrix operations used to process potential field data and waveforms, isolating anomalies and signals of interest; derivative maps, upward and downward continuation; current interpretation software. Term project.

Prerequisites: EEES 5610

Term Offered: Spring

EEES 5650 Advanced Geology Field Studies
[1-4 credit hours (0, 0-18, 0)]
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 (3, 0, 0)]
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

Term Offered: Fall

EEES 5740 Advanced Aquatic Ecology Laboratory
[1 credit hour (0, 3, 0)]
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 (3, 0, 1)]
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

Term Offered: Spring

EEES 5760 Advanced Landscape Ecology
[3 credit hours (3, 0, 0)]
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

Term Offered: Spring, Fall

EEES 5790 Ecology Field Study
[2-4 credit hours (0, 0-18, 0)]
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

Term Offered: Spring, Summer

EEES 6100 Glacial Stratigraphy And Geophysics
[3 credit hours (1, 4, 0)]
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 6160 Advanced Environmental Data Management
[3 credit hours (3, 0, 0)]
A course in data management for environmental science graduate students covering the basics of data management practices and the use of Excel and R for data preparation, evaluation, analysis, visualization, and interpretation.

EEES 6250 Graduate Launch
[1 credit hour (1, 0, 0)]
This course prepares graduate students for success by preparing individual study plans, research proposals and presentations, and launching bibliographic research.

Term Offered: Fall

EEES 6400 Biostatistics
[4 credit hours (3, 3, 0)]
Application of statistical inference with environmental and ecological data, including estimation, testing of hypotheses, and statistical modeling.

Prerequisites: EEES 6160

Term Offered: Spring, Fall

EEES 6440 Contaminant Hydrogeology
[3 credit hours (3, 0, 0)]
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
EEES 6450 Advanced Applied Hydrogeology
[3 credit hours (3, 0, 0)]
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: EECS 5410
Term Offered: Fall

EEES 6500 Multivariable Geostatistics
[3 credit hours (3, 0, 0)]
Application of multivariate statistical methods to scientific data. Emphasis is on applied regression, cluster, principal components, factor, correspondence, canonical correlation and discriminant analyses.
Prerequisites: EEES 6400

EEES 6600 Foundations Of Ecology
[4 credit hours (4, 0, 0)]
This course is a thorough review of ecological concepts for graduate students. Readings and discussion include classic papers and historical essays.
Term Offered: Spring, Fall

EEES 6650 Statistical Modeling in Environmental Sciences
[4 credit hours (3, 4, 0)]
Statistical modeling techniques applied to environmental problems, with an emphasis on multilevel modeling.
Prerequisites: EEES 6400
Term Offered: Fall

EEES 6810 Writing For The Environmental Sciences
[3 credit hours (3, 0, 0)]
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 (1, 0, 0)]
Individual presentation and discussion of papers in the environmental sciences.
Term Offered: Spring, Fall

EEES 6960 Thesis Research
[1-15 credit hours (0, 0, 0-18)]
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 (0-4, 0, 0)]
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 (0-4, 0, 0)]
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 7150 Organic Evolution
[3 credit hours (3, 0, 0)]
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

EEES 7730 Advanced Aquatic Ecology
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

EEES 7740 Advanced Aquatic Ecology Laboratory
[1 credit hour (0, 3, 0)]
Laboratory exercises on the biology of aquatic populations, communities and ecosystems.
Corequisites: EEES 7730
Term Offered: Fall

EEES 7750 Advanced Conservation Biology
[4 credit hours (3, 0, 1)]
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
Term Offered: Spring

EEES 7790 Ecology Field Trip
[2-4 credit hours (0, 0-18, 0)]
Field study of globally significant ecosystems, including analysis of structural and functional relationships within and between ecosystems. Opportunities for individual student projects.
Prerequisites: EEES 3050
Term Offered: Spring, Summer

EEES 8250 Graduate Launch
[1 credit hour (1, 0, 0)]
This course prepares graduate students for success by preparing individual study plans, research proposals and presentations, and launching bibliographic research.
Term Offered: Fall

EEES 8400 Biostatistics
[4 credit hours (3, 3, 0)]
Application of statistical inference with environmental and ecological data, including estimation, testing of hypotheses, and statistical modeling.
Prerequisites: EEES 6160
Term Offered: Spring, Fall
EEES 8500 Multivariate Geostatistics
[3 credit hours (3, 0, 0)]
Application of multivariate statistical methods to scientific data.
Emphasis is on applied regression, cluster, principal components, factor,
correspondence, canonical correlation and discriminant analyses.
Prerequisites: EEES 8400

EEES 8600 Foundations Of Ecology
[4 credit hours (4, 0, 0)]
This course is a thorough review of ecological concepts for graduate
students. Readings and discussion include classic papers and historical
essays.
Term Offered: Spring, Fall

EEES 8650 Statistical Modeling in Environmental Sciences
[4 credit hours (3, 4, 0)]
Statistical modeling techniques applied to environmental problems, with
an emphasis on multilevel modeling.
Prerequisites: EEES 6400 or EEES 8400
Term Offered: Spring

EEES 8810 Writing For The Environmental Sciences
[3 credit hours (3, 0, 0)]
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 (0, 0, 1)]
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 (0, 0, 0-15)]
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 (0-2, 0, 0)]
Course covering some aspect of ecology not covered in the formal
graduate curriculum. Students may repeat the course for different topics.
Term Offered: Spring, Fall

EEES 8990 Advanced Readings In Ecology
[2-4 credit hours (0-2, 0, 0)]
Faculty-directed readings or projects in a specific area of ecology.
Students may repeat the course for different topics.
Term Offered: Spring, Fall
ECONOMICS (ECON)

ECON 5050 Population Economics
[4 credit hours (4, 0, 0)]
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 or ECON 1200
Term Offered: Spring

ECON 5120 Monetary Theory
[4 credit hours (4, 0, 0)]
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 or ECON 3120 or ECON 3150
Term Offered: Spring

ECON 5130 Monetary And Fiscal Policy
[3 credit hours (3, 0, 0)]
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 or ECON 4120
Term Offered: Spring

ECON 5150 Advanced Macroeconomic Theory
[4 credit hours (4, 0, 0)]
The theory and instruments of macroeconomic policy. Dynamic Macroeconomic Theory.
Prerequisites: ECON 3150
Term Offered: Fall

ECON 5200 Advanced Microeconomic Theory
[4 credit hours (4, 0, 0)]
Advanced topics in microeconomic theory, consumer behavior, the firm and market structure, distribution theory, equilibrium conditions, welfare economics.
Prerequisites: ECON 3200
Term Offered: Fall

ECON 5240 Applied Environmental Economics
[4 credit hours (4, 0, 0)]
The economics of the environment and natural resources. Examination of economic instruments for solving environmental problems. Analyzed policies include direct regulation, user charges, taxes on polluting products and marketable permits.
Prerequisites: ECON 3200
Term Offered: Fall

ECON 5250 Labor Economics
[4 credit hours (4, 0, 0)]
Labor force characteristics, wage determination, hours and condition of work, unemployment, labor union structure and growth, collective bargaining and modern labor legislation.
Prerequisites: ECON 1200
Term Offered: Spring

ECON 5280 Energy Economics
[4 credit hours (4, 0, 0)]
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 or ECON 1200

ECON 5300 Mathematical Economics
[3 credit hours (3, 0, 0)]
Development and applications of the mathematical tools used by economists. Differential and integral calculus, linear algebra, transcendental functions and series.
Prerequisites: ECON 1150 or ECON 1200
Term Offered: Fall

ECON 5410 American Economic History
[3 credit hours (3, 0, 0)]
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 or ECON 1200 or ECON 1880

ECON 5510 International Economics I
[4 credit hours (4, 0, 0)]
Theory of international trade; commercial policy; costs and benefits, economic integration; trade and economic growth and balance of payments problems.
Prerequisites: ECON 1150
Term Offered: Spring

ECON 5550 Economic Development
[3 credit hours (3, 0, 0)]
Economic problems and policies in less-developed countries, including such topics as schooling, population growth, urbanization, landholding, income distribution, capital formation and development strategies.
Prerequisites: ECON 1150 or ECON 1200

ECON 5620 Regional Economics
[3 credit hours (3, 0, 0)]
Examination of regional income estimates and social accounts, regional multipliers, diverse location theories, supplemented with techniques of regional analysis.
Prerequisites: ECON 1200

ECON 5660 Public Finance Economics
[4 credit hours (4, 0, 0)]
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
Term Offered: Spring

ECON 5750 Health Economics
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring
ECON 5810 Econometrics Models And Methods I
[4 credit hours (4, 0, 0)]
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: (ECON 1150 and ECON 1200 and MATH 2630) or (ECON 1150 and ECON 1200 and ECON 2640)
Term Offered: Fall

ECON 5820 Econometrics Models And Methods II
[4 credit hours (4, 0, 0)]
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
Term Offered: Spring

ECON 5830 Econometrics Models And Methods III
[3 credit hours (3, 0, 0)]
Econometric methods that apply to survey, spatial and cross-sectional/time-series data along with other specialized modeling techniques are covered.
Prerequisites: ECON 5810
Term Offered: Spring, Fall

ECON 5980 Current Economic Problems
[3 credit hours (3, 0, 0)]
Course content changes from time to time as important economic problems arise.
Prerequisites: ECON 1150 or ECON 1200

ECON 6260 Behavioral Economics
[4 credit hours (4, 0, 0)]
Economic analysis of decisions made by people. Topics include decision-making under risk and uncertainty, strategic decision-making, and experimental economics.
Prerequisites: ECON 4810 or ECON 5810
Term Offered: Spring

ECON 6810 Seminar in Applied Econometrics I
[2 credit hours (0, 0, 2)]

ECON 6820 Seminar in Applied Econometrics II
[2 credit hours (0, 0, 2)]

ECON 6900 Graduate Research
[1-7 credit hours (0, 0, 0-3)]

ECON 6960 Thesis
[1-8 credit hours (0, 0, 0-2)]

ECON 6990 Graduate Readings
[1-7 credit hours (0, 0, 0-3)]
EDUC TECH AND PERFORMANCE TECH (ETPT)

**ETPT 5000 Introduction To Educational Technology**  
[3 credit hours (0, 3, 0)]  
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 (3, 0, 0)]  
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 5200 Computer Skills For Instructional Professionals**  
[3 credit hours (3, 0, 0)]  
Emphasizes developing skills in the use of this common productivity software and the use of computer technology in solving typical instructional problems.

**ETPT 5210 Introduction To Multimedia And Web Design**  
[3 credit hours (0, 3, 0)]  
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 5270 Instructional Video Production**  
[3 credit hours (0, 3, 0)]  
An introduction to all facets of producing video for use in various instructional settings.

**ETPT 5550 Using The Internet In The Classroom**  
[3 credit hours (0, 3, 0)]  
An introduction to effective use of Internet resources in instruction.  
**Term Offered:** Spring, Summer, Fall

**ETPT 5950 Workshop In Educational Technology & Performance Technology**  
[1-5 credit hours (0, 0, 0-5)]  
Workshops are developed around topics of interest in all areas of educational technology and performance technology. Students should discuss specific content for each offering with educational technology faculty.  
**Term Offered:** Spring, Summer, Fall

**ETPT 5990 Graduate Independent Study In Educational Technology & Performance Technology**  
[1-5 credit hours (0, 0, 0-5)]  
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 6110 Instructional Systems Design Applications**  
[3 credit hours (3, 0, 0)]  
Based on the knowledge and skills acquired in ETPT 6100/8100, students design, develop and evaluate multimedia-based instructional modules and systems.  
**Prerequisites:** (ETPT 5100 and ETPT 5210)

**ETPT 6150 Designing Instruction For Diverse Learner Populations**  
[3 credit hours (3, 0, 0)]  
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

**ETPT 6220 Developing Computer-Based Instructional Materials**  
[3 credit hours (3, 0, 0)]  
Teaches design and development of instructional software, using multimedia development environments and strategies.  
**Prerequisites:** (ETPT 5100 and ETPT 5210)

**ETPT 6230 Developing Web-Based Instructional Materials**  
[3 credit hours (0, 3, 0)]  
Students apply previously acquired skills in multimedia and Web design to develop instructional materials for delivery via the World Wide Web.  
**Prerequisites:** ETPT 5100

**ETPT 6300 Technology Management In K-16 Education**  
[3 credit hours (0, 3, 0)]  
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

**ETPT 6510 Teaching And Learning At A Distance**  
[3 credit hours (3, 0, 0)]  
Investigates various applications of distance learning for education and training.  
**Term Offered:** Summer

**ETPT 6710 Systemic Change Principles And Applications**  
[3 credit hours (3, 0, 0)]  
Examines the process of change in the diffusion and adoption of innovations in education as well as business and industry. Adoption theory is analyzed.

**ETPT 6810 Research And Theory In Educational Technology And Performance Technology**  
[3 credit hours (3, 0, 0)]  
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 (0, 0, 3)]
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 and ETPT 6110)
Term Offered: Spring, Summer, Fall

ETPT 6930 Master's Research Project In Educational Technology And Performance Technology
[1-3 credit hours (0, 0, 0-3)]
Student will complete an individual research project under the orientation of a committee of at least two faculty members in ETPT, ordinarily including the faculty adviser.

ETPT 6940 Practicum In Educational Technology And Performance Technology
[3 credit hours (0, 0, 3)]
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 6960 Master's Thesis In Educational Technology And Performance Technology
[3 credit hours (0, 0, 3)]
Students who elect this option will complete a thesis under the direction of at least two faculty members from ETPT, ordinarily including the faculty adviser.
Prerequisites: ETPT 5100

ETPT 7000 Introduction To Educational Technology
[3 credit hours (0, 3, 0)]
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 (3, 0, 0)]
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 7120 Introduction To Multimedia And Web Design
[3 credit hours (0, 3, 0)]
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 7210 Instructional Video Production
[3 credit hours (0, 3, 0)]
An introduction to all facets of producing video for use in various instructional settings.
Term Offered: Summer

ETPT 7550 Using The Internet In The Classroom
[3 credit hours (0, 3, 0)]
An introduction to effective use of Internet resources in instruction.
Term Offered: Spring, Fall

ETPT 7940 Specialist Practicum In Educational Technology And Performance Technology
[3 credit hours (0, 0, 3)]
Observation and supervised experience in an appropriate setting. Students will be assigned to work as interns under the joint supervision of school and University personnel.
Prerequisites: ETPT 7100

ETPT 7980 Special Topics In Educational Technology And Performance Technology
[1-5 credit hours (0, 0, 0-5)]
Special offerings are of interest to graduate students in educational technology and performance technology. Students should discuss specific content for each offerings with ETPT faculty.
Term Offered: Spring, Summer, Fall

ETPT 7990 Independent Study in ETPT
[1-5 credit hours (0, 0, 0-5)]
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 8110 Instructional Systems Design Applications
[3 credit hours (3, 0, 0)]
Based on the knowledge and skills acquired in ETPT 6100/8100, students design, develop and evaluate multimedia-based instructional modules and systems.
Prerequisites: (ETPT 7100 and ETPT 7210)

ETPT 8150 Designing Instruction For Diverse Learner Populations
[3 credit hours (3, 0, 0)]
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
Term Offered: Summer

ETPT 8220 Developing Computer-Based Instructional Materials
[3 credit hours (3, 0, 0)]
Teaches design and development of instructional software, using multimedia development environments and strategies.
Prerequisites: (ETPT 7100 and ETPT 7210)

ETPT 8230 Developing Web-Based Instructional Materials
[3 credit hours (0, 3, 0)]
Students apply previously acquired skills in multimedia and Web design to develop instructional materials for delivery via the World Wide Web.
Prerequisites: (ETPT 7100 and ETPT 7210)
Term Offered: Spring

ETPT 8300 Technology Management In K-16 Education
[3 credit hours (0, 3, 0)]
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
ETPT 8510 Teaching And Learning At A Distance
[3 credit hours (3, 0, 0)]
Investigates various applications of distance learning systems for education and training.
Term Offered: Summer

ETPT 8710 Systemic Change Principles And Applications
[3 credit hours (3, 0, 0)]
Examines the process of change in the diffusion and adoption of innovations in education as well as business and industry. Adoption theory is analyzed.

ETPT 8810 Research And Theory In Educational Technology And Performance Technology
[3 credit hours (3, 0, 0)]
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 8900 Doctoral Seminar In Educational Technology And Performance Technology
[3 credit hours (0, 0, 3)]
This seminar will consider problems and provide advanced study for doctoral students in educational technology and performance technology.
Prerequisites: ETPT 7100

ETPT 8920 Interdisciplinary Seminar In Educational Technology And Performance Technology
[3 credit hours (0, 0, 3)]
Considers issues and problems in various areas of educational technology and performance technology. Intended for advanced ETPT doctoral students.

ETPT 8930 Advanced Research In Educational Technology And Performance Technology
[1-5 credit hours (0, 0, 0-5)]
Individual study is designed to provide the doctoral student opportunity to work individually on professional problems under the direction of educational technology and performance technology faculty.
Term Offered: Spring

ETPT 8940 Practicum In Educational Technology And Performance Technology
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-12)]
Original research in an area of educational technology and performance technology.
Term Offered: Spring, Summer, Fall
EDUCATIONAL ADMIN AND SUPERVSN (EDAS)

EDAS 5950 Workshop In Educational Administration
[3 credit hours (3, 0, 0)]
Topical workshops, based on practical application of skills and knowledge, are intended for in-service educational professionals. Credit may be applied to doctoral degrees upon approval of the committee.

EDAS 5980 Special Topics In Educational Administration
[3 credit hours (3, 0, 0)]
Courses, based on issues, topics and concerns of educational administrators for the real world. Credit may be applied to degree programs upon approval of the adviser or committee.
Term Offered: Fall

EDAS 6000 The Individual In Organizations
[3 credit hours (3, 0, 0)]
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, Fall

EDAS 6010 Leadership in School Curriculum
[3 credit hours (3, 0, 0)]
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.

EDAS 6020 Instructional Leadership and Supervision
[3 credit hours (3, 0, 0)]
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: Fall

EDAS 6030 Developing Effective Learning Environments
[3 credit hours (3, 0, 0)]
An exploration of group dynamics/processes and the intrapersonal and interpersonal principles of high performing teams and being an effective leader. Development of effective action plans to improve school climate/culture and the learning environment is explored using problem-based learning.

EDAS 6110 Legal Aspects Of School Administration
[3 credit hours (3, 0, 0)]
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

EDAS 6150 The Administrative Experience
[3 credit hours (3, 0, 0)]
Emphasis is on blending current theory and practice by examining the use of data to guide school improvement for students. The collection of meaningful data for focused goal setting to be employed at the district, building and classroom levels is operationalized.
Term Offered: Spring

EDAS 6190 Integrated Experiences: Practicum
[3 credit hours (3, 0, 0)]
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 portfolio.
Term Offered: Spring, Fall

EDAS 6200 Continuous Improvement Of Schools
[3 credit hours (3, 0, 0)]
Course addresses current Pre K-16 national and regional reform agendas, relating them to systemic changes in policies, governance and articulation of learner outcomes in local settings.

EDAS 6210 Leadership In Diverse Settings
[3 credit hours (3, 0, 0)]
Issues of multicultural, cross-cultural, race, gender, and ethnicity in school settings are examined in diverse settings in order to develop leaders who can apply theoretical frameworks and analytical skills to improve educational performance in local, urban, suburban, rural and global setting.

EDAS 6220 Administration Of Special Programs
[3 credit hours (3, 0, 0)]
This course examines the administration of special programs that operate at the district and school level with particular focus on Special Education leadership issues. Title I, ESL, vocational education, guidance, and athletic programs are also explored.

EDAS 6230 Community And Schools
[3 credit hours (3, 0, 0)]
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 6240 Developing Learning Organizations In Educational Settings
[3 credit hours (3, 0, 0)]
Course introduces the theories, techniques and practices of planned organizational learning. Students examine the philosophical, theoretical and practical differences of organizational development as interventionist, consultative and collaborative processes in charter schools.

EDAS 6320 School Business Management
[3 credit hours (3, 0, 0)]
The purpose of the course is to involve students in an analysis of the role and functions of school business management. Participants will analyze data in each topical area of school business management.

EDAS 6330 Collective Bargaining And Dispute Resolution
[3 credit hours (3, 0, 0)]
The purpose of the course is to examine the issues that arise before, during and after the collective bargaining process in the public sector, including resolving labor disputes and grievances.
EDAS 6350 Computers In Educational Administration Decision Making
[3 credit hours (3, 0, 0)]
This course allows the development for increased decision making based on local, state and national retrievable data concerning learning, achievement, efficiency and effectiveness of resource allocations.

EDAS 6360 Personnel Management And Contract Administration In Education
[3 credit hours (3, 0, 0)]
Course provides insight into the purposes, policies and processes of personnel administration and contract administration in public education, including recruitment, hiring, induction, evaluation, compensation and development.

EDAS 6380 Planning Educational Facilities For Learning
[3 credit hours (3, 0, 0)]
This course examines the issues surrounding planning, building and maintaining educational facilities appropriate for maximizing learning. Included is an examination of legal, health and safety requirements.

EDAS 6420 Micropolitics Of School Communities
[3 credit hours (3, 0, 0)]
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 6430 Legal Aspects Of Educational Administration
[3 credit hours (3, 0, 0)]
This course provides students a background in legislation and court decisions that affect the administration of public schools. Students will investigate legal problem areas in schools.

EDAS 6440 Equity Issues In Educational Finance And Economics
[3 credit hours (3, 0, 0)]
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, Fall

EDAS 6900 Master's Seminar In Educational Administration And Supervision
[3 credit hours (0, 0, 3)]
Examination and reflection on the practice of research in Educational Leadership.

EDAS 6920 Master's Project In Educational Administration
[1-3 credit hours (0, 0, 0-1)]
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 (0, 0, 0-1)]
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 (0, 0, 0-1)]
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 (0, 0, 0-1)]
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 7950 Workshop In Educational Administration
[1-3 credit hours (3, 0, 0)]
Topical workshops, based on practical application of skills and knowledge, are intended for in-service educational professionals. Credit may be applied to degree programs upon approval of the adviser or committee.

EDAS 7980 Special Topics In Educational Administration
[3 credit hours (3, 0, 0)]
Courses, based on issues, topics and concerns of educational administrators for the real world. Credit may be applied to degree programs upon approval of the adviser or committee.

EDAS 7990 Independent Study In Education Administration
[1-3 credit hours (0, 0, 0-3)]
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 (3, 0, 0)]
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, Fall

EDAS 8010 Supervision For Improved Instruction
[3 credit hours (0, 0, 0)]
An examination of those principles of supervision which promote improved instruction. Emphasis is on teacher performance evaluation, curriculum management and strategies for staff development to improve staff performance.
Term Offered: Spring

EDAS 8020 Instructional Leadership
[3 credit hours (3, 0, 0)]
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: Fall

EDAS 8030 Developing Effective Learning Environments
[3 credit hours (3, 0, 0)]
An exploration of group dynamics/processes and the intrapersonal and principles of high performing teams and being an effective leader. Development of effective action plans to improve school climate/culture and the learning environment is explored using problem-based learning.
EDAS 8110 Legal Aspects Of School Administration
[3 credit hours (3, 0, 0)]
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

EDAS 8150 The Administrative Experience
[3 credit hours (3, 0, 0)]
Emphasis is on blending current theory and practice by examining the use of data to guide school improvement for students. The collection of meaningful data for focused goal setting to be employed at the district, building and classroom levels is operationalized.
Term Offered: Spring

EDAS 8190 Integrated Experiences In Education Administration
[3 credit hours (0, 0, 3)]
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 8200 Continuous Improvement Of Schools
[3 credit hours (3, 0, 0)]
Course addresses current Pre K-16 national and regional reform agendas for charter schools, relating them to systemic changes in policies, governance and articulation of learner outcomes in local settings.

EDAS 8210 Leadership In Diverse Settings
[3 credit hours (3, 0, 0)]
Issues of multicultural, cross-cultural, race, gender, and ethnicity in school settings are examined in diverse settings in order to develop leaders who can apply theoretical frameworks and analytical skills to improve educational performance in local, urban, suburban, rural and global setting.

EDAS 8220 Administration Of Special Programs
[3 credit hours (3, 0, 0)]
This course examines the administration of special programs that operate at the district and school level with particular focus on Special Education leadership issues. Title I, ESL, vocational education, guidance, and athletic programs are also explored.
Term Offered: Summer

EDAS 8230 Community And Schools
[3 credit hours (3, 0, 0)]
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 8240 Developing Learning Organizations In Educational Settings
[3 credit hours (3, 0, 0)]
Course introduces the theories, techniques and practices of planned organizational learning. Students examine the philosophical, theoretical and practical differences of organizational development as interventionist, consultative and collaborative processes in charter schools.

EDAS 8300 Integrate Experiences: Policies In Action
[3 credit hours (0, 0, 3)]
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 8310 School District Leadership
[3 credit hours (0, 0, 0)]
Analysis of duties, roles and responsibilities of local school district leadership. Specific competencies of building school support, planning, curriculum development, personnel, legal, financial and planning are covered.

EDAS 8320 School Business Management
[3 credit hours (3, 0, 0)]
The purpose of the course is to involve students in an analysis of the role and functions of school business management. Participants will analyze data in each topical area of school business management.

EDAS 8330 Collective Bargaining And Dispute Resolution
[3 credit hours (3, 0, 0)]
The purpose of the course is to examine the issues that arise before, during and after the collective bargaining process in the public sector, including resolving labor disputes and grievances.

EDAS 8350 Computers In Educational Administration Decision Making
[3 credit hours (3, 0, 0)]
This course allows the development for increased decision making based on local, state and national retrievable data concerning learning, achievement, efficiency and effectiveness of resource allocations.

EDAS 8360 Personnel Management And Contract Administration In Education
[3 credit hours (3, 0, 0)]
Course provides insight into the purposes, policies and processes of personnel administration and contract administration in public education, including recruitment, hiring, induction, evaluation, compensation and development.

EDAS 8380 Planning Educational Facilities For Learning
[3 credit hours (3, 0, 0)]
This course examines the issues surrounding planning, building and maintaining educational facilities appropriate for maximizing learning. Included is an examination of legal, health and safety requirements.

EDAS 8420 Micropolitics Of School Communities
[3 credit hours (3, 0, 0)]
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 8430 Legal Aspects Of Educational Administration
[3 credit hours (3, 0, 0)]
This course provides students a background in legislation and court decisions that affect the administration of public schools. Students will investigate legal problem areas in schools.

EDAS 8440 Equity Issues In Educational Finance And Economics
[3 credit hours (3, 0, 0)]
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

EDAS 8600 Leadership And Organizational Theory
[3 credit hours (3, 0, 0)]
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 8610 Organizational Behavior
[3 credit hours (3, 0, 0)]
This course integrates the educational and management theories and knowledge bases on leadership, power, motivation and change to understand the internal and external dynamics of people in educational organizations.
Term Offered: Spring

EDAS 8620 Politics And Policy Analysis And Development
[3 credit hours (3, 0, 0)]
This course examines the issues involved in policy formation and analysis along with the political process of public education. Local, intermediate, state and federal levels are considered.
Term Offered: Spring

EDAS 8640 Leading Systems Change
[3 credit hours (3, 0, 0)]
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 8650 Interdisciplinary Perspectives In Educational Administration
[3 credit hours (0, 0, 3)]
Seminar focused on interdisciplinary examination of critical issues in educational administration. Multiple theoretical lenses from sociology, political science, economics and science are used to address educational issues.

EDAS 8660 Critical Analysis Of Inquiry In Schools
[3 credit hours (3, 0, 0)]
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: Fall

EDAS 8930 Doctoral Seminar In Educational Administration And Supervision
[3 credit hours (0, 0, 3)]
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: Fall

EDAS 8940 Educational Administration Internship
[3 credit hours (0, 0, 3)]
An advanced field/seminar experience for doctoral students with fieldwork at the school system level. Fieldwork employs application of graduate coursework under supervision by the school system and the university.

EDAS 8960 Doctoral Dissertation In Educational Administration And Supervision
[1-12 credit hours (0, 0, 0-1)]
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
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<td>Cultural Perspectives In Learning And Development</td>
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EDP 5110 Basic Educational Psychology
[3 credit hours (3, 0, 0)]
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 5120 Alternative Approaches To Discipline
[3 credit hours (3, 0, 0)]
Reviews a variety of models, constructs and methodologies for addressing behavior and discipline problems, especially within school and family settings. Emphases are placed on individual and group approaches to discipline.

EDP 5210 Child Behavior And Development
[3 credit hours (0, 0, 3)]
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 child growth and development.
Term Offered: Spring, Summer, Fall

EDP 5220 Adolescent Behavior And Development
[3 credit hours (3, 0, 0)]
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 5230 Adult Development
[3 credit hours (3, 0, 0)]
Emphasizes classical and modern theories of adulthood from a critical perspective, as well as applications of research on cognitive, physical, personality and social development from early adulthood through old age.
Term Offered: Summer, Fall

EDP 5240 Applied Child and Adolescent Development
[3 credit hours (3, 0, 0)]
The course will address issues that impact school and mental health professionals. For example K12 teachers, school psychologists, clinical psychologists, social workers, school counselors, nurses, SROs. Theory and research on physical, cognitive, social, and emotional development are examined and used as the bases for understanding child and adolescent development. Special attention will be focused on practical application.
Term Offered: Spring, Summer

EDP 5310 Issues And Innovations In Learning And Instruction
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 5330 Behavior Management
[3 credit hours (3, 0, 0)]
Theory and research related to behavioral and cognitive approaches to behavior management. Students will carry out research-based behavior management projects requiring behavioral analyses, observation, program design, development and evaluation.
Term Offered: Fall

EDP 5950 Workshop In Educational Psychology
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 6130 Human Coping In Adulthood
[3 credit hours (3, 0, 0)]
Considers models, research methodologies and constructs on coping in relation to a range of circumstances during the adult years. Emphasis is placed on coping behavior within an ecological context.
Term Offered: Spring

EDP 6140 Motivation Theory And Application
[3 credit hours (3, 0, 0)]
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, counselling and industry.
Prerequisites: EDP 5110 or EDP 5210 or EDP 5220 or EDP 5230 or EDP 7110 or EDP 7230
Term Offered: Spring

EDP 6150 Cultural Perspectives In Learning And Development
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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 or EDP 5120 or EDP 5220 or EDP 5230 or PSY 4500 or PSY 4700

EDP 6190 Seminar In Educational Psychology
[3 credit hours (0, 0, 3)]
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 6240 Theories Of Development
[3 credit hours (3, 0, 0)]
Analysis and evaluation of theories of development with emphasis on the philosophical and psychological evolutionary history of the theories and their usefulness for individuals in the helping professions.
Prerequisites: EDP 5210 or EDP 5220

EDP 6250 Social Development
[3 credit hours (3, 0, 0)]
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 or EDP 5220
Term Offered: Fall

EDP 6260 Research Methods In Child And Adolescent Development
[3 credit hours (3, 0, 0)]
Builds upon basic understanding of development through direct experiences in child study. This course provides individual/small group experiences in the design, implementation and written/oral presentation of original research.
Prerequisites: EDP 5210 or EDP 5220
Term Offered: Fall

EDP 6270 Parenting: Theory And Research
[3 credit hours (3, 0, 0)]
Analysis and evaluation of the research on parenting across a variety of sociocultural contexts.
Prerequisites: EDP 5320

EDP 6340 Theories Of Learning
[3 credit hours (3, 0, 0)]
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 6350 Advanced Topics In Cognition And Instruction
[3 credit hours (3, 0, 0)]
Theory and research on cognition related to learning/instruction, to include study of expertise, knowledge learned from experience, analysis of ill-structured domains, tacit knowledge, and knowledge representation.
Prerequisites: (EDP 5110 and EDP 5320) or (EDP 7110 and EDP 7320)

EDP 6360 Thinking And Reasoning In School Contexts
[3 credit hours (3, 0, 0)]
Analysis of theory, research policy, and practice about thinking and reasoning in school subjects and school learning in democratic societies.
Term Offered: Fall

EDP 6370 News Media Literacy, Society, and the Mind
[3 credit hours (0, 0, 3)]
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 become critical and effective news media consumers.

EDP 6380 Prevention Through Postvention in Targeted Violence Terrorism and Suicide
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-3)]
A formal, independent study culminating in a written discourse that advances our understanding of educational psychology.
Term Offered: Spring, Fall

EDP 6980 Master's Project In Educational Psychology
[1-3 credit hours (0, 0, 0-3)]
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 (0, 0, 0-3)]
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 Basic Educational Psychology
[3 credit hours (3, 0, 0)]
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 7230 Adult Development
[3 credit hours (3, 0, 0)]
Emphasizes classical and modern theories of adulthood from a critical perspective, as well as applications of research on cognitive, physical, personality and social development from early adulthood through old age.
Term Offered: Summer, Fall
EDP 7240 Applied Child and Adolescent Development
[3 credit hours (3, 0, 0)]
The course will address issues that impact school and mental health professionals, for example K12 teachers, school psychologists, clinical psychologists, social workers, school counselors, nurses, and SROs. Theory and research on physical, cognitive, social, and emotional development are examined and used as the basis for understanding child and adolescent development. Special attention will be focused on practical application.
Term Offered: Spring, Summer

EDP 8140 Motivation Theory And Application
[3 credit hours (3, 0, 0)]
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 or EDP 5210 or EDP 5220 or EDP 5230 or EDP 7110 or EDP 7230
Term Offered: Spring

EDP 8150 CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 or EDP 5120 or EDP 5220 or EDP 5230 or PSY 4500 or PSY 4700

EDP 8180 Interdisciplinary Seminar In Foundations Of Education
[1 credit hour (0, 0, 1)]
The pro-seminar will enable doctoral students to improve their understanding of the research process. Students will learn to ask research questions, choose alternative methodologies and interpret the validity of conclusions.

EDP 8190 Seminar In Educational Psychology
[3 credit hours (0, 0, 3)]
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 8240 Theories Of Development
[3 credit hours (3, 0, 0)]
Analysis and evaluation of theories of development with emphasis on the philosophical and psychological evolutionary history of the theories and their usefulness for individuals in the helping professions.
Prerequisites: EDP 5210 or EDP 5220

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[3 credit hours (3, 0, 0)]
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.
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[3 credit hours (3, 0, 0)]
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[3 credit hours (3, 0, 0)]
Analysis and evaluation of the research on parenting across a variety of sociocultural contexts.

EDP 8340 Theories Of Learning
[3 credit hours (3, 0, 0)]
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 8350 Advanced Topics In Cognition And Instruction
[3 credit hours (3, 0, 0)]
Theory and research on cognition related to learning/instruction, to include study of expertise, knowledge learned from experience, analysis of ill-structured domains, tacit knowledge, and knowledge representation.
Prerequisites: (EDP 5110 and EDP 5320) or (EDP 7110 and EDP 7320)

EDP 8360 Thinking And Reasoning In School Contexts
[3 credit hours (3, 0, 0)]
Analysis of theory, research policy, and practice about thinking and reasoning in school subjects and school learning in democratic societies.
Term Offered: Fall

EDP 8370 News Media Literacy, Society, and the Mind
[3 credit hours (0, 0, 3)]
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 (3, 0, 0)]
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 (0, 0, 0-3)]
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 (0, 0, 0-3)]
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
EECS 5120 Introduction to Fuzzy Systems and Applications
[3 credit hours (3, 0, 0)]
Term Offered: Fall

EECS 5130 Digital Design
[4 credit hours (0, 2.5, 3)]
The design of digital systems, design methodologies, hardware description language such as VHDL, behavioral-, dataflow- and structural-level description of digital systems. Implementation technologies including PLDs and FPGAs.
Term Offered: Spring

EECS 5170 Real-Time Embedded Systems Design
[3 credit hours (0, 2.5, 2)]
Programming applications in a real-time environment. Applications programs in a multitasking environment. Examples from process control, robotics, signal analysis and multiwindow software.

EECS 5200 Feedback Control Systems
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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: Fall

EECS 5360 Communication Systems
[3 credit hours (3, 0, 0)]
Fourier transform applications in signal analysis and communication. Signals spectra, Filtering, AM and FM modulations, Noise and optimum receiver, Sampling theorem, Multiplexing, PCM Introduction to digital modulators and demodulators.
Term Offered: Spring, Fall

EECS 5370 Information Theory And Coding
[3 credit hours (3, 0, 0)]
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

EECS 5380 Digital Signal Processing
[3 credit hours (3, 0, 0)]
Discrete Fourier Transform (DFT), Discrete convolution and correlation, Fast Fourier Transform (FFT) and its applications. Design of IIR and FIR digital filters, Multi-rate/channel digital systems, Decimation and Interpolation.
Term Offered: Spring

EECS 5390 Wireless And Mobile Networks
[3 credit hours (3, 0, 0)]
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 5400 Solid State Electronics
[3 credit hours (3, 0, 0)]
A comprehensive treatment of the theory and operation of physical electronic devices emphasizing electrical transport in metals and semiconductors and various models of BJT's and FET's.
Term Offered: Fall

EECS 5410 Electro-Optics
[3 credit hours (3, 0, 0)]
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: Fall

EECS 5460 Power Systems Analysis
[3 credit hours (3, 0, 0)]
Fault analysis, Transient Stability Analysis, Transmission System modeling, Distribution Networks.
Term Offered: Spring
EECS 5470 Electronic Design
[3 credit hours (0, 2.5, 2)]
Principles and techniques of analog active circuit design. Selected design problems are given; working circuits using standard parts are designed and laboratory tested. A design notebook is kept.
Term Offered: Spring

EECS 5480 Electronic Energy Processing I
[3 credit hours (0, 2.5, 2)]
Term Offered: Fall

EECS 5480 Electronic Energy Processing II
[3 credit hours (0, 2.5, 2)]
Resonant dc-dc converters. DC-AC inverters and harmonic analysis. Variable-speed motor drives. Laboratory design and analysis of various electronic energy processing circuits.
Prerequisites: EECS 5480
Term Offered: Spring

EECS 5500 Programming for the World Wide Web
[3 credit hours (3, 0, 0)]
Fundamental concepts and programming languages for constructing contemporary 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
[4 credit hours (4, 0, 0)]
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.
Term Offered: Spring

EECS 5530 Computer Graphics I
[4 credit hours (0, 2.5, 3)]
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.
Term Offered: Fall

EECS 5540 Computer Graphics II
[4 credit hours (0, 2.5, 3)]
Examines current topics related to realistic and representative 3D computer graphics. Topics include curve and surface geometry, solid modeling, raytracing, radiosity and real-time computer graphics.
EECS 5560 Database Systems I
[3 credit hours (3, 0, 0)]
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: Fall

EECS 5590 Human Computer Interface Design
[3 credit hours (3, 0, 0)]
This course presents the fundamental theory and practice of design, implementation and evaluation of human-computer interfaces.
Term Offered: Spring

EECS 5600 Solid State Devices
[3 credit hours (3, 1, 0)]
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
[4 credit hours (0, 2.5, 3)]
CMOS process technologies. CMOS logic families. Custom and semicustom design. Subsystem design; adders, counters, multipliers. System design methods. VLSI design tools.
Prerequisites: EECS 3400

EECS 5740 Artificial Intelligence
[3 credit hours (3, 0, 0)]
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 multi-agent environments.
Term Offered: Spring

EECS 5750 Machine Learning
[3 credit hours (3, 0, 0)]
This course emphasizes learning algorithms and theory including concept, decision tree, neural network, comptritional, Bayesian, evolutionary, and reinforcement learning.
Prerequisites: (MIME 4000 and MATH 2890 and EECS 2110)
Term Offered: Fall

EECS 5760 Computer Security
[3 credit hours (3, 0, 0)]
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 and EECS 3540
Term Offered: Fall

EECS 5920 Projects
[1-6 credit hours (0, 0, 0)]
Independent research project with intensive investigation into an area of practical interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

EECS 5930 Electrical Engineering & Computer Science Seminar
[1 credit hour (1, 0, 0)]
All graduate students are expected to attend the seminars and to prepare a report summarizing their experiences, questions and the impact of the seminar series. Students will also present their thesis and dissertation results.
Term Offered: Spring, Fall
EECS 5980 Special Topics in EECS
[1-4 credit hours (1-4, 0, 0)]
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 (3, 0, 0)]
Architectural development in computer systems and scalability. Processors and arithmetic algorithms. Memory hierarchy, shared memory and cache architecture. Pipeline, superscaler and vector organization.
Term Offered: Fall

EECS 6180 Biologically Inspired Computing
[3 credit hours (3, 0, 0)]
Term Offered: Spring

EECS 6190 Renewable Energy and Smart Grid
[3 credit hours (3, 0, 0)]
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 these changes.
Term Offered: Fall

EECS 6230 Optimal Control Theory
[3 credit hours (3, 0, 0)]
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

EECS 6250 Advanced Digital Signal Processing
[3 credit hours (3, 0, 0)]
Documention/interpolation filter design, wavelet transforms, spectral estimation, multirate, adaptive, radar and array signal processing techniques, beamforming, simulation of signal processing algorithms via MATLAB or equivalent.
Term Offered: Spring

EECS 6300 Random Signals And Optimal Filters
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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, multimedia compression standards, JPEG, MPEG coding.
Term Offered: Spring

EECS 6340 Modern Communications Engineering I
[3 credit hours (3, 0, 0)]
Introduction to detection and estimation and applications to the bandpass signals, Binary and M-ary digital modulation techniques, Error-control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques.
Term Offered: Fall

EECS 6350 Modern Communications Engineering II
[3 credit hours (3, 0, 0)]
Digital transmission over Gaussian/non-Gaussian channels, Satellite systems (GEO and LEO) and multiple accesses, Cellular and satellite communication network, Mobile/wireless Personal communication services (PCS) and its networking.
Prerequisites: EECS 6340
Term Offered: Spring

EECS 6390 Modeling And Performance Evaluation Of Communication Networks
[3 credit hours (3, 0, 0)]
Term Offered: Spring, Fall

EECS 6410 Advanced Electromagnetic Components
[3 credit hours (3, 0, 0)]
Maxwell’s equations, transmission line theory, technology CAD, circuit modeling of magnetics, antenna design, electromagnetic interference (EMI), signal integrity.
Term Offered: Fall

EECS 6420 Computer-Aided Modeling and Design of Circuits
[3 credit hours (3, 0, 0)]
Introduction to computer aided design, classification of CAD operations, modified nodal admittance matrix, frequency-domain analysis, time-domain analysis of nonlinear circuits, sensitivity analysis, high-frequency modeling and design.
Term Offered: Fall

EECS 6450 Advanced Power Electronics
[3 credit hours (3, 0, 0)]
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

EECS 6550 Software Specification And Design
[3 credit hours (3, 0, 0)]
This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.
Term Offered: Fall

EECS 6570 Intelligent Systems
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Term Offered: Spring

EECS 6630 Digital and VLSI System Testing
[3 credit hours (3, 0, 0)]
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 6660 Field Programmable Gate Arrays
[3 credit hours (3, 0, 0)]
Introduction to FPGA’s. Programming technology, Logic block architectures. Routing architectures. FPGA based VLSI design. Design tools.
Term Offered: Fall

EECS 6830 Power Semiconductor Device Engineering
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 1)]
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 (0, 0, 0)]
Graduate research towards the completion of a Master’s degree.
Term Offered: Spring, Summer, Fall

EECS 6980 Special Topics In Electrical Engineering & Computer Science
[1-5 credit hours (0, 0, 0)]
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 (0, 0, 0)]
In depth study of a selected topic of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall

EECS 7520 Advanced Systems Programming
[4 credit hours (4, 0, 0)]

EECS 8110 Advanced Computer Architecture
[3 credit hours (3, 0, 0)]
Architectural development in computer systems and scalability. Processors and arithmetic algorithms. Memory hierarchy, shared memory and cache architecture. Pipeline, superscalar and vector organization.
Term Offered: Fall

EECS 8180 Biologically Inspired Computing
[3 credit hours (3, 0, 0)]
Introduction to Computational Techniques inspired from Biology, Evolutionary Computations, Evolutionary Fuzzy Systems and Evolutionary Neural Systems, Swarm Intelligence, and Artificial life.
Term Offered: Spring

EECS 8190 Renewable Energy and Smart Grid
[3 credit hours (3, 0, 0)]
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 these changes.
Term Offered: Fall

EECS 8220 Nonlinear Control Systems
[3 credit hours (3, 0, 0)]
EECS 8230 Optimal Control Theory
[3 credit hours (3, 0, 0)]
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
EECS 8250 Advanced Digital Signal Processing
[3 credit hours (3, 0, 0)]
Documentation/interpolation filter design, wavelet transforms, spectral estimation, multirate, adaptive, radar and array signal processing techniques, beamforming, simulation of signal processing algorithms via MATLAB or equivalent.
Term Offered: Spring
EECS 8300 Random Signals And Optimal Filters
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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, multimedia compression standards, JPEG, MPEG coding.
Term Offered: Spring
EECS 8340 Modern Communications Engineering I
[3 credit hours (3, 0, 0)]
Introduction to detection and estimation and applications to the bandpass signals, Binary and M-ary digital modulation techniques, Error-control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques.
Term Offered: Fall
EECS 8350 Modern Communications Engineering II
[3 credit hours (3, 0, 0)]
Digital transmission over Gaussian/non-Gaussian channels, Satellite systems (GEO and LEO) and multiple accesses, Cellular and satellite communication network, Mobile/wireless Personal communication services (PCS) and its networking.
Prerequisites: EECS 6340
Term Offered: Spring
EECS 8390 Modeling And Performance Evaluation Of Communication Networks
[3 credit hours (3, 0, 0)]
Term Offered: Spring, Fall
EECS 8410 Advanced Electromagnetic Components
[3 credit hours (3, 0, 0)]
Maxwell's equations, transmission line theory, technology CAD, circuit modeling of magnetics, antenna design, electromagnetic interference (EMI), signal integrity.
Term Offered: Fall
EECS 8420 Computer-Aided Modeling and Design of Circuits
[3 credit hours (3, 0, 0)]
Introduction to computer aided design, classification of CAD operations, modified nodal admittance matrix, frequency-domain analysis, time-domain analysis of nonlinear circuits, sensitivity analysis, high-frequency modeling and design.
Term Offered: Fall
EECS 8450 Advanced Power Electronics
[3 credit hours (3, 0, 0)]
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
EECS 8550 Software Specification And Design
[3 credit hours (3, 0, 0)]
This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.
Term Offered: Fall
EECS 8570 Intelligent Systems
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Term Offered: Spring
EECS 8630 Digital and VLSI System Testing
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Introduction to FPGA’s. Programming technology. Logic block architectures. Routing architectures. FPGA based VLSI design. Design tools.
Term Offered: Fall

EECS 8830 Power Semiconductor Device Engineering
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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

EECS 8860 RF Integrated Circuits
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0-6)]
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 (0, 0, 1)]
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
[1-15 credit hours (0, 0, 0-15)]
Graduate research towards completion of a doctoral degree.
Term Offered: Spring, Summer, Fall

EECS 8980 Current Topics In Electrical Engineering & Computer Science
[1-5 credit hours (0, 0, 0)]
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 (0, 0, 0-3)]
In depth study of a selected topic of mutual interest to the student and the instructor.
Term Offered: Spring, Summer, Fall
ENGL 5090 Current Writing Theory
[3 credit hours (3, 0, 0)]
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 History Of The English Language
[3 credit hours (3, 0, 0)]
Study of the origins and development of the English language.
Prerequisites: ENGL 3150 or LING 3150 or ENGL 5150 or LING 5150 or ENGL 7150 or LING 7150
Term Offered: Spring, Summer, Fall

ENGL 5150 Linguistic Principles
[3 credit hours (3, 0, 0)]
Intensive study of modern linguistic theories about the nature and structure of language, with emphasis on English.
Term Offered: Spring, Fall

ENGL 5200 British Fiction: 18th Century
[3 credit hours (3, 0, 0)]
A course in 18th Century fiction with emphasis on the novels of Defoe, Richardson, Fielding, Smollett, and Sterne and their relation to historical background and literary theory.

ENGL 5210 Issues in ESL Writing
[3 credit hours (3, 0, 0)]
Course content
Term Offered: Spring, Fall

ENGL 5280 American Fiction: 20th Century
[3 credit hours (3, 0, 0)]
A study of the chief developments in content and form of the American short story and novel since World War I, partly through intensive analysis of works by selected major writers.
Term Offered: Spring, Fall

ENGL 5300 Medieval and Early Tudor Drama
[3 credit hours (0, 0, 3)]
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 mummeries, and royal entries, as well as modern revivals.

ENGL 5310 British Drama: 1580-1642
[3 credit hours (3, 0, 0)]
A study of early British drama exclusive of Shakespeare, with particular attention to Elizabehan drama and its background.

ENGL 5410 Old And Middle English Literature
[3 credit hours (3, 0, 0)]
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 English Renaissance
[3 credit hours (3, 0, 0)]
Poetry and prose of the English Renaissance, including the sonnet tradition; "Spenser's Faire Queene"; Shakespeare's longer poems; the prose of Raleigh, Hoby, Ascham, and Elyot; "Defense of Poesy"; More's "Utopia."
Term Offered: Spring, Fall

ENGL 5430 Approaches to English As A Second Language
[3 credit hours (0, 0, 3)]
Examination of a broad range of approaches to the teaching of English as a Second Language, including how these approaches fit into different theoretical assumptions and how they are implemented in practice.
Term Offered: Spring

ENGL 5460 Restoration And 18th Century British Literature
[3 credit hours (3, 0, 0)]
Drama, poetry, and prose of the Restoration, Neo-classical and pre-Romantic periods, focusing on literary strategies and themes, political and cultural contexts.

ENGL 5500 British Literature: The Romantic Period
[3 credit hours (3, 0, 0)]
Study of major authors and genres of the Romantic period: approximately 1789 to 1837.
Term Offered: Spring, Fall

ENGL 5520 British Literature: The Victorian Period
[3 credit hours (3, 0, 0)]
Study of major authors, genres and ideas of the Victorian period: approximately 1837 to 1901.
Term Offered: Spring, Fall

ENGL 5540 20th Century British Literature
[3 credit hours (3, 0, 0)]
British poetry of the early 20th century, including the works of such poets as Hopkins, Housman, Hardy, Yeats, Owen, Lawrence, Auden and Thomas, and the research and criticism relevant to them.

ENGL 5560 Literature of the British Empire 1850 to The Present
[3 credit hours (0, 0, 0)]
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 5580 Early American Literature
[3 credit hours (3, 0, 0)]

ENGL 5590 American Literary Romanticism
[3 credit hours (3, 0, 0)]
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
ENGL 5630 American Literary Realism
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Study of African American prose, poetry, drama and fiction from 1760 to 1915.
Term Offered: Fall

ENGL 5660 African American Writing In The 20th Century
[3 credit hours (3, 0, 0)]
A literary, historical and social consideration of the achievement of black American writers since 1915.
Term Offered: Spring, Summer

ENGL 5680 American Literature Since World War II
[3 credit hours (3, 0, 0)]
Major trends in postwar American literature, including traditional and uncanonical writers. Emphasis may be on poetry or prose by instructor’s option.
Term Offered: Fall

ENGL 5690 Native American Literature And Culture
[3 credit hours (3, 0, 0)]
Native American literature interrogates a selection of texts by and about Native Americans, including the oral traditions of storytelling and mythology.
Term Offered: Spring

ENGL 5750 History Of Literary Criticism
[3 credit hours (3, 0, 0)]
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

ENGL 5780 Contemporary Literary Theories And Criticism
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
A study of Shakespeare’s plays with emphasis on his development as a dramatist and with readings in major Shakespearean criticism.
Term Offered: Fall

ENGL 5820 Milton
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Author changes with each offering. Consult Time Schedules for authors to be studied.
Term Offered: Spring, Fall
ENGL 6190 Environments For ESL Learning
[3 credit hours (3, 0, 0)]
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 or ENGL 5150 or ENGL 7150 or LING 3150 or LING 5150 or LING 7150
Term Offered: Fall

ENGL 6410 Seminar: Studies In Early English Literature
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
Seminar on a specialized topic in English Renaissance literature.

ENGL 6440 Seminar: Studies In Early 17th Century Literature
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in early 17th century English literature.
Term Offered: Fall

ENGL 6460 Seminar: Studies In Restoration And 18th Century British Literature
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in Restoration and 18th century British literature.

ENGL 6500 Seminar: Studies In British Romantic Literature
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in British Romantic literature.

ENGL 6520 Seminar: Studies In Victorian Literature
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in Victorian literature.
Term Offered: Spring, Fall

ENGL 6620 Seminar: Studies In American Literary Romanticism
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in American literary Romanticism.

ENGL 6630 Seminar: Studies In American Literary Realism
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in American literary realism.

ENGL 6640 Seminar: Studies In 20th Century American Literature
[3 credit hours (0, 0, 3)]
Seminar on a specialized topic in 20th century American literature.
Term Offered: Spring, Fall

ENGL 6940 Internship in English as a Second Language
[2 credit hours (0, 0, 2)]
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 (0, 0, 0-3)]
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 (0, 0, 1-3)]
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 (0, 0, 3)]
Seminar on a specialized topic in English studies.
Term Offered: Spring, Summer

ENGL 6990 Independent Study
[1-3 credit hours (0, 0, 0-3)]
By permission of department; may be repeated for additional credit.
Term Offered: Spring, Summer, Fall

ENGL 8990 Independent Study
[1-3 credit hours (0, 0, 0-3)]
By permission of department; may be repeated for additional credit.
Term Offered: Spring, Fall
ENTREPREN, FAM AND SMALL BUSN (EFSB)

EFSB 6590 New Venture Creation  
[3 credit hours (0, 0, 3)]  
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: Fall

EFSB 6690 Technology Commercialization  
[3 credit hours (0, 0, 3)]  
Course addresses the entire technology commercialization process, from idea to market. A key feature of the course is a "strategic opportunity evaluation" of an actual early stage technology. (Prerequisite: EFSB 6590)  
Term Offered: Spring, Fall

EFSB 6790 Venture Capital Finance  
[3 credit hours (0, 0, 3)]  
Course considers how potential entrepreneurial investments are evaluated, valued, structured, and enhanced. Primarily focuses on financing start-up and early stage firms, later stage investments, and buyouts. (Prerequisites: BUAD 6200 and EFSB 6590)
EXECUTIVE MBA (EMBA)

EMBA 5500 Analytic Foundation For Executives
[3 credit hours (3, 0, 0)]
This course provides managers with the analytical foundations in economics, computer skills and statistical methods. Internet exercises prior to class meetings provide the basis for continuous discussions of current economic events.
Term Offered: Fall

EMBA 6100 Global Competitive Challenge
[3 credit hours (3, 0, 0)]
An overview of the competitive challenge faced by firms in today's global setting. Executives select nations or regions and industries to analyze in terms of the competitive challenge. Factors which helped the nations/regions to achieve competitive advantage will be studied to gain a better understanding of the competitive challenge.
Prerequisites: EMBA 5500
Term Offered: Fall

EMBA 6120 Cultural, Legal, & Operational Issues in Doing Business Abroad
[3 credit hours (3, 0, 0)]
This course develops the executive's appreciation, knowledge, and understanding of the different cultures and legal systems as they impact business operations in doing business in major foreign countries or regions, including emerging markets. The underpinning of cross-cultural literacy for global competitive advantage is emphasized.
Prerequisites: EMBA 5500
Term Offered: Spring, Fall

EMBA 6140 Accounting And Financial Foundations For Executives
[3 credit hours (3, 0, 0)]
This course gives an overview of the firm from a financial management perspective including financial decision making. Topics covered include the time value of money, stock and bond valuation, and capital budgeting decision rules.
Prerequisites: EMBA 5500
Term Offered: Spring

EMBA 6200 Personal Strategic Planning And Entrepreneurship
[3 credit hours (3, 0, 0)]
Executives assess their personal values, clarifying their personal goals and develop a career strategy. Identifying market opportunities and developing new businesses for today's technological and global environment are explored.
Prerequisites: EMBA 5500
Term Offered: Fall

EMBA 6210 Processes for Ethical Business Decisions
[3 credit hours (3, 0, 0)]
Introduces executives to specific analytical processes for identifying the ethical dilemmas frequently experienced in business, resolving them and then justifying the course of action selected from multiple ethical perspectives. These processes are essential for recognizing and understanding the ethical implications of complex and controversial problems in culturally diverse and competitive organizations. The course involves ongoing practice in ethical dilemma resolution in both group and individual formats involving various ethical scenarios.
Prerequisites: EMBA 5500
Term Offered: Spring, Summer, Fall

EMBA 6220 Accounting Systems For Operational And Strategic Management
[3 credit hours (3, 0, 0)]
Emphasizes the preparation and use of financial statements, accounting for international transactions and tax consequences of U.S. and international operations. Managerial accounting and control systems are examined. Focuses on the tax consequences of selected transactions of both U.S. and international operations.
Prerequisites: EMBA 5500
Term Offered: Fall

EMBA 6230 Market-Driven Analysis And Strategy
[3 credit hours (3, 0, 0)]
This course focuses on what it means to be market-oriented and provides individuals with a basic understanding of the market-based management practices needed to create superior customer value. Being 'market-driven' 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 and make give it a competitive advantage.
Prerequisites: EMBA 5500
Term Offered: Spring

EMBA 6240 Entrepreneurial Financial Management
[3 credit hours (3, 0, 0)]
Studies the management of international financial activities, including financial planning and forecasting, capital budgeting and leasing, capital structure, working capital management, sources of funds, business valuation and risk management.
Prerequisites: EMBA 5500
Term Offered: Spring, Summer

EMBA 6250 Leadership And Performance Management
[3 credit hours (3, 0, 0)]
Executives learn to be visionary leaders by understanding how change, culture and strategy link to the vision. This course also focuses on employee motivation, development and empowerment, culminating in insights on how to manage performance in order to achieve the company's mission.
Prerequisites: EMBA 5500
Term Offered: Fall
EMBA 6290 Strategic Management In A Global Environment
[3 credit hours (3, 0, 0)]
The goal of the capstone course is for each executive to finish an integrated business plan creating value for his or her sponsoring firm. Strategic planning tools are studied.
Prerequisites: EMBA 5500
Term Offered: Fall

EMBA 6300 Global Technology Management
[3 credit hours (3, 0, 0)]
This course focuses on the strategic and technical challenges facing executives who want to take advantage of today's existing and emerging technological developments to enhance business opportunities. Best practices are reviewed and the focus is on how executives can manage technology across functions to best achieve competitive advantage.
Prerequisites: EMBA 5500
Term Offered: Spring, Summer

EMBA 6310 Managing Global Supply Chains
[3 credit hours (3, 0, 0)]
Examines how e-business models, information technology and globalization have changed supply chain design and management. Effective information management for decision making is explored.
Prerequisites: EMBA 5500
Term Offered: Spring, Summer, Fall

EMBA 6320 Product Development
[3 credit hours (3, 0, 0)]
This course is designed to provide an understanding of how new products/services and e-business initiatives are developed and managed and explores the tools and skills needed to manage these processes.
Prerequisites: EMBA 5500
Term Offered: Spring, Summer

EMBA 6470 Global/E-Business Field Trip
[2 credit hours (0, 0, 2)]
This experiential international field trip facilitates student learning of best business practices from senior executives in a variety of multinational firms and organizations across industries, and enables them to gain new insights from being immersed in foreign cultural environments.
Prerequisites: EMBA 5500
Term Offered: Fall

EMBA 6980 Special Topics in Business
[1-3 credit hours (1-3, 0, 0)]
Analysis of current issues in business, specialized industries, or specific markets. Syllabus determined jointly by EMBA office and faculty as special topics are identified.

EMBA 6990 Independent Study
[3 credit hours (3, 0, 0)]
Independent research report on a business topics of interest to the student and faculty member. Students must work with a professor on this project. Permission of Instructor required.
FACULTY DEVELOPMENT (FACD)

FACD 6250 Learning/Instruct Theories
[3 credit hours (0, 0, 0)]
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 relevant to the development of instructional units and appropriate evaluation strategies.

FACD 6350 Teach/Learn Hlth Med Sci
[3 credit hours (0, 0, 0)]
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 (0, 0, 0)]
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 or FACD 635
Term Offered: Fall

FACD 6970 Teaching/Learning Project
[3 credit hours (0, 0, 0)]
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 and FACD 6250) or (FACD 635 and FACD 625)
FINANCE (FINA)

FINA 5210 Economics For Business Decisions
[3 credit hours (3, 0, 0)]
This course is designed for students with little or no prior formal economic education. The course consists of two distinct halves—microeconomics and macroeconomics. The former deals with economic behavior at disaggregated levels; the individual, firm, and industry levels. The macroeconomics portion deals with economic behavior and policy making at the highest level of aggregation topics include unemployment, inflation, and economic growth and related government and quasi-governmental institutions.

Term Offered: Spring, Summer, Fall

FINA 5310 Managerial Finance
[3 credit hours (3, 0, 0)]
This course is designed to develop the skills necessary to understand how financial managers make value-maximizing decisions in their organization. Contents include fundamentals of financial analysis, short and long-term investments, time value of money, stock and bond valuation, risk and return, and corporate structure.

Prerequisites: ACCT 5000 or BUAD 2040 and BUAD 2050 or ACTG 1040 and ACTG 1050

Term Offered: Spring, Summer, Fall

FINA 6130 Advanced Corporate Finance
[3 credit hours (3, 0, 0)]
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

Term Offered: Spring, Summer, Fall

FINA 6140 Investments And Security Analysis
[3 credit hours (3, 0, 0)]
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: BUAD 6200

Term Offered: Summer, Fall

FINA 6150 Financial Institutions And Markets
[3 credit hours (3, 0, 0)]
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: BUAD 6200

Term Offered: Spring, Fall

FINA 6340 Derivative Securities
[3 credit hours (3, 0, 0)]
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: BUAD 6200

Term Offered: Spring

FINA 6370 MBA International Financial Management
[3 credit hours (3, 0, 0)]
Techniques and theory of financial management in an international environment. The role of international markets in risk reduction and profit maximization are emphasized.

Prerequisites: BUAD 6200

Term Offered: Summer, Fall

FINA 6480 Student Managed Portfolio
[3 credit hours (0, 0, 3)]
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 responsibilities.

Prerequisites: BUAD 6200

Term Offered: Spring, Fall

FINA 6750 Research In Finance
[1-3 credit hours (0, 0, 0-3)]
This course fulfills the need for students who would like to do research on specific area of finance supervised by a faculty member.

Prerequisites: BUAD 6200

Term Offered: Spring, Summer, Fall
FRENCH (FREN)

FREN 5010 Advanced French Stylistics I
[3 credit hours (3, 0, 0)]
A study of structural and stylistic principles of French with emphasis on various writing activities.
Term Offered: Spring, Fall

FREN 5020 Advanced French Stylistics II
[4 credit hours (0, 0, 4)]
A study of structural and stylistic principles of French with emphasis on various writing activities.
Term Offered: Spring

FREN 5050 Advanced Conversation
[3 credit hours (3, 0, 0)]
Intensive practice in speaking French.
Term Offered: Fall

FREN 5070 French Translation
[3 credit hours (3, 0, 0)]
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 Colloquium I
[3 credit hours (0, 0, 3)]
A course in the theory and practice of teaching French and of second language acquisition in general.
Term Offered: Fall

FREN 5190 Study Abroad
[1-12 credit hours (0, 0, 0-12)]
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 French-speaking country.

FREN 5200 Contemporary French And Francophone Civilization
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Course designed to develop sufficient reading proficiency to conduct and process research in French. (Not for majors)
Term Offered: Spring, Fall

FREN 5220 French For Reading Knowledge II
[3 credit hours (0, 0, 3)]
Course designed to develop sufficient reading proficiency to conduct and process research in French. (Not for majors)

FREN 5310 Medieval Studies
[3 credit hours (0, 0, 3)]
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 (3, 0, 0)]
Literature reflecting major currents of the Renaissance.
Term Offered: Spring, Fall

FREN 5510 17th Century French Literature
[3 credit hours (3, 0, 0)]
A study of the development of French Classicism.
Term Offered: Spring, Fall

FREN 5610 18th Century French Literature
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Literary and intellectual trends from Romanticism to Symbolism.

FREN 5810 Contemporary French & Francophone Literature I
[3 credit hours (3, 0, 0)]
Literature of all genres from the period before World War I to the present.
Term Offered: Spring, Fall

FREN 5850 Le Cinema Francais
[3 credit hours (0, 0, 3)]
A study of the development of French film and its place in world cinema.
Term Offered: Spring, Fall

FREN 5860 La Production Feminine
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0-1)]
Independent research in special topics. May be repeated once for additional credit.

FREN 6900 Research In French
[1-3 credit hours (0, 0, 0-3)]
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 5500 Applications of Engineering Analysis**
[3 credit hours (0, 3, 0)]
A course in analysis for engineers. Topics include: Linear differential equations, continuous and discrete series representation. Laplace transforms, matrix methods, eigenvalues and eigenvectors, systems of equations.
**Term Offered:** Fall

**GNEN 5700 Applied Probability and Statistics**
[3 credit hours (3, 0, 0)]
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 6700 Management of Projects and Technological Innovation**
[3 credit hours (3, 0, 0)]
Study of new Accelerated Radical Innovation discipline targeting 2X-10X improvement innovation effectiveness, measured by reduced risk, time and cost. Assessment and modeling to speed development, transfer and profitable commercialization.
**Term Offered:** Fall

**GNEN 6920 Special Projects in Engineering**
[1-6 credit hours (0, 0, 1-6)]
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**
[1-6 credit hours (0, 0, 1-6)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (15, 0, 0)]
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 (3, 0, 0)]
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 or GEPL 4110
Term Offered: Spring

GEPL 5210 Land Use Planning
[3 credit hours (3, 0, 0)]
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 5310 Geography of Gypsies (Romanies) and Travelers
[3 credit hours (3, 0, 0)]
Exploration 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 disciplines.
Term Offered: Spring, Summer, Fall

GEPL 5420 Quantitative methods in geographic research
[3 credit hours (3, 0, 0)]
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
[4 credit hours (4, 0, 0)]
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 EEEES2100 or GEPL3350.
Term Offered: Fall

GEPL 5500 Digital Image Analysis
[3 credit hours (3, 0, 0)]
Explores digital image analysis techniques such as classification and principal components analysis. Terrestrial and coastal applications of satellite image analysis are performed in intensive laboratory sessions.
Prerequisites: EEEES 5490 or GEPL 5490
Term Offered: Spring

GEPL 5520 Analytical And Computer Cartography
[4 credit hours (4, 0, 0)]
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 5510
Term Offered: Spring

GEPL 5530 Principles Of Urban Planning
[3 credit hours (3, 0, 0)]
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 (15, 0, 0)]
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 (4, 0, 0)]
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 (4, 0, 0)]
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
Term Offered: Spring

GEPL 5600 Urban Design
[3 credit hours (3, 0, 0)]
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 intracite elements, cultural, ecological and aesthetic considerations, historic preservation, and interdisciplinary collaboration. Research project required.
Term Offered: Fall
GEPL 5650 Physical Geography
[3 credit hours (15, 0, 0)]
This course will introduce you to the fundamental aspects of physical geography: the understanding of the physical elements and processes which comprise the environment and the spatial patterns of these elements and processes.
Term Offered: Spring

GEPL 5700 Community Planning Workshop
[3 credit hours (0, 0, 3)]
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.
Prerequisites: GEPL 4600
Term Offered: Spring

GEPL 5710 Urban Environments
[3 credit hours (15, 0, 0)]
Examines urban areas, the approaches to studying them, and explanations offered for urban processes and forms.
Term Offered: Spring, Fall

GEPL 5750 Transportation Geography
[3 credit hours (15, 0, 0)]
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 5810 Political Geography
[3 credit hours (15, 0, 0)]
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 (0, 0, 0)]

GEPL 5920 Readings in Geography
[1-3 credit hours (0, 0, 0)]

GEPL 6100 Philosophy & General Methodology
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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

GEPL 6160 Seminar In Spatial Analysis
[4 credit hours (4, 0, 0)]
A computer-based laboratory course in multivariate spatial analysis methodologies. The course includes the study of spatial graphics and mapping, computerized regionalization, areal forecasting and predictive modeling techniques.
Prerequisites: GEPL 6150

GEPL 6190 Advanced Geographic Information Systems Seminar
[4 credit hours (4, 0, 0)]
Seminar in advanced GIS topics which include database design, spatial analysis and specialized application to spatial problems.
Prerequisites: GEPL 5180 or GEPL 6180

GEPL 6200 Earth System Science Through Inquiry-Based Learning
[3 credit hours (3, 0, 0)]
The course is geared towards in-service teachers. Teachers will explore four natural events affecting the earth as a system, using inquiry-based learning and lesson plan development.
Term Offered: Summer

GEPL 6300 Seminar In Resource Management
[3 credit hours (0, 0, 3)]
Intensive group study of major themes in the resource management literature. Primary emphasis is placed on individual student research projects oriented toward resource management problems.

GEPL 6530 Seminar-Urban/Regional Planning Applications
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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 6570 Seminar In Neighborhood Revitalization
[3 credit hours (0, 0, 3)]
Intensive group study of major themes in the revitalization of urban neighborhoods, both residential and commercial. Major emphasis is placed upon individual residential and commercial. Major emphasis is placed upon individual student research projects oriented toward specific revitalization problems.

GEPL 6580 Urban Development And Housing
[3 credit hours (3, 0, 0)]
Course examines the changing land use and functions of metropolitan regions. City suburban linkages, urban restructuring, urban policy and metropolitan planning issues are examined.

GEPL 6700 Teaching Practicum In Geography
[1-6 credit hours (0, 0, 0)]
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 (0, 0, 3)]
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 (0, 0, 2)]
The course is used for the completion of the comprehensive exam requirement for M.A candidates.
Prerequisites: (GEPL 6100 and GEPL 6150)
Term Offered: Spring, Fall

GEPL 6920 Research Design
[3 credit hours (0, 0, 3)]
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.
Prerequisites: (GEPL 6100 and GEPL 6150 and GEPL 6910)
Term Offered: Summer, Fall

GEPL 6930 General Seminar
[3 credit hours (3, 0, 0)]

GEPL 6940 Internship In Planning
[1-6 credit hours (0, 0, 0)]
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 (0, 0, 2.5)]
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 (0, 0, 0-6)]
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 (3, 0, 0)]  
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 (4, 0, 0)]  
Further review of German stylistic structures through the analysis of texts and written and oral exercises.  
Prerequisites: GERM 5010  
Term Offered: Spring  
GERM 5160 Teaching Colloquium  
[3 credit hours (0, 0, 3)]  
A practical course in the theories, methods and specific techniques of teaching German. May be repeated once for additional credit.  
Term Offered: Summer  
GERM 5190 Study Abroad  
[1-12 credit hours (0, 0, 0-3)]  
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: Fall  
GERM 5200 German Culture And Civilization  
[3 credit hours (0, 0, 3)]  
Study of major trends and current developments in German Landeskunde. May be repeated when topic varies.  
Term Offered: Fall  
GERM 5210 German For Reading Knowledge I  
[3 credit hours (0, 0, 3)]  
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 (3, 0, 0)]  
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 (0, 0, 3)]  
Study of selected works by authors from Büchner to Fontane.  
Term Offered: Spring  
GERM 5720 German Romanticism  
[3 credit hours (3, 0, 0)]  
Study of Romantic writers of Germany such as Novalis, Eichendorff, E.T.A. Hoffmann and Bettina Brentano.  
GERM 5780 German Literature Of The 20th Century  
[3 credit hours (3, 0, 0)]  
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 (0, 0, 3)]  
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 (0, 0, 0-3)]  
Study of a selected topic in German language, literature, or culture. May be repeated for credit when topic varies.  
Term Offered: Spring, Fall  
GERM 5990 Independent Study In German  
[1-3 credit hours (0, 0, 0-1)]  
Independent research in special topics. May be repeated once for additional credit.  
Term Offered: Spring, Fall  
GERM 6900 Research In German  
[1-3 credit hours (0, 0, 0-1)]  
Independent research of a selected topic in German language, literature, or culture. May be repeated once for additional credit.  
Term Offered: Spring, Summer  
GERM 6930 Seminar: Selected Topics  
[1-3 credit hours (0, 0, 0-3)]  
Study of selected topics in German language, literature, or culture. May be repeated once for additional credit.  
Term Offered: Spring, Summer
GIFTED AND TALENTED EDUCATION (GIFT)

GIFT 5100 Introduction To Talented And Gifted Education
[3 credit hours (3, 0, 0)]
Survey of major topics about the education and development of talents and gifts, including history, identification, social-emotional development, curriculum, creativity, intelligence, programming and evaluation.
Term Offered: Spring, Fall

GIFT 5200 Assessment And Evaluation In Talented And Gifted Education
[3 credit hours (3, 0, 0)]
The study of assessment and evaluation as it pertains to the special educational needs of talented and gifted persons. Theoretical and practical issues in assessing talent domains and educational programs are emphasized.

GIFT 5300 Socioemotional Development Of The Talented And Gifted
[3 credit hours (3, 0, 0)]
Examination of the social and emotional needs of talented and gifted persons within the context of roles in family, school and society. Attention to issues of guidance, parenting, special populations and underachievement.
Term Offered: Summer, Fall

GIFT 5400 Creativity In The Classroom
[3 credit hours (3, 0, 0)]
Explores existing theories about creativity; examination of approaches and their implementation within various educational settings.
Term Offered: Spring

GIFT 5500 Curriculum I: Differentiation For The Talented And Gifted
[3 credit hours (3, 0, 0)]
The study of curriculum models, theories and trends, principles and practices of differentiation, and application of content within various educational settings.
Term Offered: Spring, Summer

GIFT 5600 Curriculum II: Integrating & Implementing Service Plans For The Talented & Gifted
[3 credit hours (3, 0, 0)]
The study, development and implementation of curriculum models across content areas both vertically and horizontally within various educational settings. Focuses on multi-exceptionalities and implications of varied service delivery plans.
Term Offered: Summer

GIFT 5700 Practicum In Talented And Gifted Education
[3-6 credit hours (0, 0, 0-6)]
Provides opportunities for field experience to use and refine the strategies for persons with talented and gifted abilities.
Term Offered: Spring, Summer, Fall

GIFT 6000 Issues & Trends In Talented And Gifted Education
[3 credit hours (3, 0, 0)]
The course examines the current theoretical and practical issues that are dominating the literature in the field. Perennial issues such as identification and intelligence will be discussed, as well as emergent topics such as the biological bases of advanced development and creativity and emotional adjustment.

GIFT 6100 Advanced Development In Social, Cultural & Political Context In Talented & Gifted Education
[3 credit hours (3, 0, 0)]
The course explores social, cultural and political contexts related to advanced development or expression of talents. Emphasizes personal reflection and recognition of hegemony related to gifted individuals’ past, present and future.
Prerequisites: (GIFT 5100 and GIFT 5300)

GIFT 6900 Advanced Seminar In Teaching, Learning & Curriculum Theory In Talented & Gifted Education
[3 credit hours (0, 0, 3)]
The course studies teaching, learning and curriculum from theoretical and historical perspectives to establish defensible lines of scholarly inquiry in gifted education.

GIFT 6910 Seminar In Talent & Advanced Development I: Academic Talents
[3 credit hours (0, 0, 3)]
The course studies the theoretical and research basis for development of specific academic domains, such as science, mathematics, language and literature, etc. Attention is paid to tacit as well as more public kinds of knowledge.

GIFT 6920 Seminar In Talent & Advanced Development II: Aesthetic Talents
[3 credit hours (0, 0, 3)]
The course studies development and expression of aesthetic abilities and talents such literacy, theatrical and/or musical expressiveness, visual and performing arts, emotional giftedness, movement and dance.

GIFT 6930 Seminar In Talent & Advanced Development III: Practical, Folk & Sport
[3 credit hours (0, 0, 3)]
The course studies the theoretical and research basis for development of talents in folk, practical and athletic domains. Attention is paid to tacit, esoteric and public forms of knowledge.

GIFT 6950 Master’s Research Project In Talented And Gifted Education
[3 credit hours (0, 0, 3)]
Independent research project that integrates and synthesizes concepts and practices in gifted and talented education with implementation of action research and practical inquiry study.
Term Offered: Spring, Fall

GIFT 6980 Special Topics About Advanced Development In The Talented And Gifted
[3-6 credit hours (0, 0, 0-6)]
Collaborative inquiry into emerging topics in the field. This course is open to advanced graduate students in the master’s or doctoral program.

GIFT 6990 Independent Study In The Development Of The Talented & Gifted
[1-6 credit hours (0, 0, 0-6)]
Directed readings and/or study on a topic selected in conjunction with a faculty mentor.
Term Offered: Spring
GIFT 7100 Introduction To Talented And Gifted Education
[3 credit hours (3, 0, 0)]
Survey of major topics about the education and development of talents and gifts, including history, identification, social-emotional development, curriculum, creativity, intelligence, programming and evaluation.
Term Offered: Spring, Fall

GIFT 7200 Assessment And Evaluation In Talented And Gifted Education
[3 credit hours (3, 0, 0)]
The study of assessment and evaluation as it pertains to the special educational needs of talented and gifted persons. Theoretical and practical issues in assessing talent domains and educational programs are emphasized.

GIFT 7300 Socioemotional Development Of The Talented And Gifted
[3 credit hours (3, 0, 0)]
Examination of the social and emotional needs of talented and gifted persons within the context of roles in family, school and society. Attention to issues of guidance, parenting, special populations and underachievement.
Term Offered: Fall

GIFT 7400 Creativity In The Classroom
[3 credit hours (3, 0, 0)]
Explores existing theories about creativity; examination of approaches and their implementation within various educational settings.

GIFT 7500 Curriculum I: Differentiation For The Talented And Gifted
[3 credit hours (3, 0, 0)]
The study of curriculum models, theories and trends, principles and practices of differentiation, and application of content within various educational settings.
Term Offered: Spring, Summer

GIFT 7600 Curriculum II: Integrating & Implementing Service Plans For The Talented & Gifted
[3 credit hours (3, 0, 0)]
The study, development and implementation of curriculum models across content areas both vertically and horizontally within various educational settings. Focuses on multi-exceptionalities and implications of varied service delivery plans.
Term Offered: Spring, Summer, Fall

GIFT 7700 Practicum In Talented And Gifted Education
[3-6 credit hours (0, 0, 3)]
Provides opportunities for field experience to use and refine the strategies for persons with talented and gifted abilities.
Term Offered: Spring, Summer, Fall

GIFT 8000 Issues & Trends In Talented And Gifted Education
[3 credit hours (3, 0, 0)]
The course examines the current theoretical and practical issues that are dominating the literature in the field. Perennial issues such as identification and intelligence will be discussed, as well as emergent topics such as the biological bases of advanced development and creativity and emotional adjustment.
Term Offered: Spring, Summer, Fall

GIFT 8100 Advanced Development In Social, Cultural & Political Context In Talented & Gifted Education
[3 credit hours (3, 0, 0)]
The course explores social, cultural and political contexts related to advanced development or expression of talents. Emphasizes personal reflection and recognition of hegemony related to gifted individuals’ past, present and future.

GIFT 8900 Advanced Seminar In Teaching, Learning & Curriculum Theory In Talented & Gifted Education
[3 credit hours (0, 0, 3)]
The course studies teaching, learning and curriculum from theoretical and historical perspectives to establish defensible lines of scholarly inquiry in gifted education.
Term Offered: Spring, Fall

GIFT 8910 Seminar In Talent & Advanced Development I: Academic Talents
[3 credit hours (0, 0, 3)]
The course studies the theoretical and research basis for development of specific academic domains, such as science, mathematics, language and literature, etc. Attention is paid to tacit as well as more public kinds of knowledge.

GIFT 8920 Seminar In Talent & Advanced Development II: Aesthetic Talents
[3 credit hours (0, 0, 3)]
The course studies development and expression of aesthetic abilities and talents such literacy, theatrical and/or musical expressiveness, visual and performing arts, emotional giftedness, movement and dance.
Term Offered: Fall

GIFT 8930 Seminar In Talent & Advanced Development III: Practical, Folk & Sport
[3 credit hours (0, 0, 3)]
The course studies the theoretical and research basis for development of talents in folk, practical and athletic domains. Attention is paid to tacit, esoteric and public forms of knowledge.

GIFT 8940 Internship In Gifted Studies
[3-6 credit hours (0, 0, 0-6)]
Supervised internship in college teaching, or administration/leadership in agencies, or research and evaluation for advanced graduate students to practice skills and knowledge within settings relevant to career goals in talented and gifted education.
Term Offered: Spring, Summer

GIFT 8960 Doctoral Dissertation
[1-15 credit hours (0, 0, 0-15)]
Developing, conducting analyzing and writing the dissertation.
Term Offered: Spring, Summer, Fall

GIFT 8980 Special Topics About Advanced Development In The Talented And Gifted
[3-6 credit hours (0, 0, 0-6)]
Collaborative inquiry into emerging topics in the field. This course is open to advanced graduate students in the master’s or doctoral program.
Term Offered: Spring, Summer, Fall
GIFT 8990 Independent Study In The Development Of The Talented & Gifted
[1-6 credit hours (0, 0, 0-6)]
Directed readings and/or study on a topic selected in conjunction with a faculty mentor.
**Term Offered:** Spring, Summer, Fall
HEALTH EDUCATION (HEAL)

HEAL 5750 Obesity And Eating Disorders
[3 credit hours (3, 0, 0)]
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 5930 General Seminar In Health Education
[1-3 credit hours (0-3, 0, 0)]
A seminar to consider health problems and provide advanced study in health education. A graduate student may register for this seminar two or more times with permission of the adviser.
Term Offered: Spring, Fall

HEAL 6280 Health Communication
[3 credit hours (3, 0, 0)]
Designed to help students identify, analyze, and apply concepts, theories and methodologies related to health communication in various settings and at various levels of influence. Emphasis will be placed on learning how to design, communicate and evaluate effective health promotion messages.
Term Offered: Spring

HEAL 6300 Community Health Organization
[3 credit hours (3, 0, 0)]
Focuses on techniques to bring about change in a community’s health status through assessment, public advocacy, coalition building, decision making, planning, policy development and political influence. Application will be emphasized.

HEAL 6360 Applied Survey Research In Health
[3 credit hours (3, 0, 0)]
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.

HEAL 6530 Drug Use And Misuse
[3 credit hours (3, 0, 0)]
Focuses on impact of drug abuse and misuse on the individual and society. Explores physiological, psychological, societal and rehabilitative aspects of substance abuse. Prevention strategies are addressed.
Term Offered: Summer, Fall

HEAL 6540 Human Sexuality
[3 credit hours (3, 0, 0)]
The course examines the historical, physiological, psychological, sociological and ethical aspects of human sexuality in health and illness. Extensive emphasis is placed on reviewing the pertinent periodical literature.

HEAL 6600 Health Behavior
[3 credit hours (3, 0, 0)]
Examines the role of behaviors on health status and how to influence and understand behavior through use of cognitive models and change theory. Applications through projects are emphasized.
Term Offered: Spring, Summer, Fall

HEAL 6720 Issues In Minority Health
[3 credit hours (3, 0, 0)]
This course will be an examination of the demographic trends of racial/ethnic minorities and social, political and economic factors affecting the physical and mental well-being of minorities.
Term Offered: Fall

HEAL 6880 Scientific Writing In Health
[3 credit hours (0, 0, 8)]
Examines salient issues related to scientific writing and academic publishing, including ethical issues surrounding publication and best practices for scientific writing in academia.

HEAL 6900 Grant Writing In Health Sciences
[3 credit hours (0, 0, 3)]
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 and HEAL 6800)
Term Offered: Spring, Fall

HEAL 6920 Master's Research Project In Health Education
[1-4 credit hours (0, 0, 0-1)]
Open to graduate students who elect the completion of a master’s project in fulfilling the research elective of the master's program. Students may register for the credits in more than one semester.
Term Offered: Spring, Summer, Fall

HEAL 6930 Interdisciplinary Seminar In Health Education
[1-3 credit hours (0, 0, 0-3)]
A seminar to consider problems and provide advanced study in several fields of education and other disciplines related to health education. Open only to advanced graduate students.
Term Offered: Spring, Summer

HEAL 6990 Independent Study In Health Education
[1-3 credit hours (0, 0, 0-3)]
The student will participate in independent readings, laboratory research, field experience and other activities not suited for class instruction. May be repeated for course credit.
Term Offered: Spring, Fall

HEAL 8000 Professional Issues In Health Education
[3 credit hours (3, 0, 0)]
This course will examine the historical and philosophical foundations underlying the health education profession. Occupational and ethical issues specific to the field of health education will be explored. Special emphasis will be placed on becoming a culturally competent professional.
Term Offered: Fall

HEAL 8080 Social Determinants of Health
[3 credit hours (3, 0, 0)]
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 8100 College Teaching In Health Education
[3 credit hours (0, 0, 3)]
This course is designed to provide an overview of the issues surrounding teaching health education at the college level. The course will include information on course development, effective teaching, tenure and promotion process, and professional development.
Term Offered: Fall

HEAL 8190 Statistical Packages for Public Health
[3 credit hours (3, 0, 0)]
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 or PUBH 8000
Term Offered: Fall

HEAL 8200 Methods And Materials In Public Health
[3 credit hours (3, 0, 0)]
Introduces students to resource materials and methods appropriate for public health education. Students will use various mediums of instruction in direct application to public health programs.
Term Offered: Spring, Fall

HEAL 8250 Nutritional Epidemiology
[3 credit hours (3, 0, 0)]
Examination of human nutritional needs. Emphasized the role of diet in health and disease throughout the lifecycle and includes current nutrition issues. Personal nutritional practices are analyzed and evaluated.
Prerequisites: HEAL 8700
Term Offered: Spring

HEAL 8280 Health Communication
[3 credit hours (3, 0, 0)]
Designed to help students identify, analyze, and apply concepts, theories and methodologies related to health communication in various settings and at various levels of influence. Emphasis will be placed on learning how to design, communicate and evaluate effective health promotion messages.
Term Offered: Spring

HEAL 8300 Community Health Organization
[3 credit hours (3, 0, 0)]
Focuses on techniques to bring about change in a community’s health status through assessment, public advocacy, coalition building, decision making, planning, policy development and political influence. Application will be emphasized.
Term Offered: Spring

HEAL 8360 Applied Survey Research In Health
[3 credit hours (3, 0, 0)]
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 8460 Health Promotion Programs
[3 credit hours (3, 0, 0)]
This course introduces the principles of health promotion program planning. Students learn the precursors to program planning as well as the purposes, procedures, terminology, and specific techniques in the planning process.

HEAL 8520 Public Health Nutrition
[3 credit hours (3, 0, 0)]
Explore the interdisciplinary and entrepreneurial approaches that lead to effective community nutrition programs. Investigates the impact of these programs to alleviate national and international nutritional problems.
Term Offered: Spring

HEAL 8530 Drug Use And Misuse
[3 credit hours (3, 0, 0)]
Focuses on impact of drug abuse and misuse on the individual and society. Explores physiological, psychological, societal and rehabilitative aspects of substance abuse. Prevention strategies are addressed.
Term Offered: Summer, Fall

HEAL 8540 Human Sexuality
[3 credit hours (3, 0, 0)]
The course examines the historical, physiological, psychological, sociological and ethical aspects of human sexuality in health and illness. Extensive emphasis is placed on reviewing the pertinent periodical literature.
Term Offered: Spring

HEAL 8600 Health Behavior
[3 credit hours (3, 0, 0)]
Examines the role of behaviors on health status and how to influence and understand behavior through use of cognitive models and change theory. Applications through projects are emphasized.
Term Offered: Spring, Summer, Fall

HEAL 8720 Issues In Minority Health
[3 credit hours (3, 0, 0)]
This course will be an examination of the demographic trends of racial/ethnic minorities and social, political and economic factors affecting the physical and mental well-being of minorities.
Term Offered: Fall

HEAL 8800 Evaluation Of Health Programs
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring, Fall

HEAL 8880 Scientific Writing In Health
[3 credit hours (0, 0, 8)]
This course is designed to integrate research methods with the writing of a five-chapter thesis or dissertation, including: selecting a topic, literature reviews; research hypotheses; selecting participants; data analysis; instrument development; institutional review boards; references; conclusions, discussion, and recommendations.
Prerequisites: (HEAL 8600 and HEAL 8800)
Term Offered: Spring

HEAL 8900 Grant Writing In Health Sciences
[3 credit hours (0, 0, 3)]
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 8320 and HEAL 8800)
Term Offered: Spring, Fall
HEAL 8930 Interdisciplinary Seminar In Health Education
[1-3 credit hours (0, 0, 0-3)]
A seminar to consider problems and provide advanced study in several fields of education and other disciplines related to health education. Open only to advanced graduate students.
Term Offered: Spring, Summer, Fall

HEAL 8940 Public Health Internship
[1-4 credit hours (0, 0, 0-6)]
A field internship designed to supplement classroom experience by providing direct insight into the operation of a public health agency through participant-observer experience.
Term Offered: Spring, Fall

HEAL 8960 Doctoral Research Dissertation
[1-12 credit hours (0, 0, 0-12)]
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 (0, 0, 0-3)]
The student will participate in independent readings, laboratory research, field experience and other activities not suited for class instruction. May be repeated for course credit.
Term Offered: Spring, Summer, Fall
HEALTH SCIENCE & HUMAN SERVICE (HSHS)

HSHS 6000 Statistics and Research for Health Science and Human Service Professions
[3-5 credit hours (3-5, 0, 0)]
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

HSHS 8000 Statistics and Research for Health Science and Human Service Professions
[3-5 credit hours (3-5, 0, 0)]
An interdisciplinary course covering basic statistics and related research design with specific applications in various health sciences and human service professions.
Term Offered: Summer
HIGHER EDUCATION (HED)

HED 5900 Diversity Leadership
[3 credit hours (3, 0, 0)]
Review and application of diversity work as it relates to leadership frameworks and media impacts. Topics include but are not limited to diversity team leadership types, diversity examined through interpersonal and mass communication lenses, and understanding the components of being an effective Chief Diversity Officer.
Term Offered: Fall

HED 5910 Diversity Beginnings
[3 credit hours (3, 0, 0)]
This course will review and apply diversity-related theory, social and psychological understanding, and interpersonal communication to diversity experiences. The course is designed to cultivate an awareness of diversity through communication in education, work, and social settings.
Term Offered: Fall

HED 5920 Introduction to Master's Studies in Higher Education
[1-3 credit hours (0, 0, 0-3)]
This course explores the expectations and challenges of graduate education. We will look at the role of the graduate student, faculty, adviser, and other university offices that support your journey.
Term Offered: Fall

HED 5930 Interdisciplinary Seminar
[3 credit hours (3, 0, 0)]
This seminar formatted course will provide the opportunity to explore problems and issues from the perspectives of the various fields of education and of other disciplines related to higher education.

HED 5950 Workshop In Higher Education
[1-3 credit hours (0, 0, 0-3)]
Each workshop is developed on a topic of interest to faculty members and administrators of higher education institutions. Practical applications of the workshop topic will be emphasized.

HED 5960 Diversity in Practice
[3 credit hours (3, 0, 0)]
This course is designed to explore dimensions of diversity in different settings like that of health care. Dimensions of diversity will include but are not limited to topics of global citizenship, socioeconomic diversity, religious diversity, gender and gender identity, LGBQT, ADA laws, race and ethnicity, successful aging, and harassment and bullying.
Term Offered: Spring

HED 5970 Diversity Advancement
[3 credit hours (3, 0, 0)]
This course is designed to teach how to measure effectiveness of diversity-related programs, review of tools and instruments for strategic planning, creation and implementation of diversity plans, and exploration of components of being an effective Chief Diversity Officer (CDO).
Term Offered: Summer

HED 5980 Special Topics In Higher Education
[1-3 credit hours (0-3, 0, 0)]
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 (3, 0, 0)]
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 (0, 3, 0)]
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 6210 The Community College
[3 credit hours (3, 0, 0)]
A study of the history, distinguishing characteristics (mission, functions, organization, curriculum, finances) and current issues facing community colleges, including marginalization of students and institutions, and transfer and articulation policy.

HED 6250 Technical Higher Education
[3 credit hours (3, 0, 0)]
This course examines the development, mission, functions, and assessment of technical, occupational, and career education, including community needs assessment.

HED 6270 Learning and Teaching in Higher Education
[3 credit hours (3, 0, 0)]
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 6410 College & University Curriculum
[3 credit hours (3, 0, 0)]
The course examines the philosophical and conceptual underpinnings of college and university curriculum. It introduces a model for curriculum planning, implementation, and evaluation in American higher education, and a framework for designing and assessing courses and curricula.
Term Offered: Fall

HED 6440 General Education In Higher Education
[3 credit hours (3, 0, 0)]
This course will examine the meaning and purposes of general education in the United States. Students will become acquainted with the design, analysis and evaluation of general education curricula.

HED 6510 The American College Student
[3 credit hours (3, 0, 0)]
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 6520 Organization & Management Of Student Affairs
[3 credit hours (3, 0, 0)]
This course provides an overview of functional areas of student affairs and the philosophies and ethics that guide the profession. The overview also considers general areas that influence student affairs such as university mission, campus culture and environment, leadership, financing and budgeting, university assessment, student demographics and diversity, and student development.
Term Offered: Spring, Summer, Fall

HED 6530 Theories Of Student Development
[3 credit hours (3, 0, 0)]
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, Fall

HED 6540 Advising Diverse Students
[3 credit hours (3, 0, 0)]
This seminar considers the advising role of higher education professionals, emphasizing the ways that culture, race, ethnicity, gender, religion, sexual orientation, socio economic status, and other diversities may impact work with students.
Term Offered: Spring, Fall

HED 6570 Research in Higher Education
[3 credit hours (0, 0, 3)]
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, Fall

HED 6610 Issues Of Access In Higher Education
[3 credit hours (3, 0, 0)]
This course explores access issues that result from the changing educational needs of society and analyzes the application of democratic ideals of American education to current educational policies affecting access.

HED 6630 Faculty Issues in Higher Education
[3 credit hours (3, 0, 0)]

HED 6640 Governance And Administration In Higher Education
[3 credit hours (3, 0, 0)]
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: Fall

HED 6650 Community College Leadership
[3 credit hours (0, 0, 3)]
This course examines community college leadership and administration. It introduces models for leading change and explores challenges facing community college leaders.
Term Offered: Summer, Fall

HED 6660 Building Academic Culture
[3 credit hours (3, 0, 0)]
An examination of institutional culture and the interplay of student, faculty and administrative subcultures. Critical perspectives are used to analyze and understand cultural inquiry, conflict and collaboration in post secondary institutions.

HED 6700 Finance Of Higher Education
[3 credit hours (3, 0, 0)]
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, Fall

HED 6710 Economics Of Higher Education
[3 credit hours (3, 0, 0)]
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

HED 6750 Strategic Planning And Decision Making
[3 credit hours (0, 0, 3)]
This course provides an overview and applications of strategic planning theories and methods in higher education and explores how external environments and internal dynamics affect planning processes. The development and implementation of strategic plans are covered as well as the leadership skills needed to direct strategic decision-making.

HED 6770 Evaluation And Outcomes Assessment In Higher Education
[3 credit hours (3, 0, 0)]
This course focuses on outcomes-based assessment of learning and development in student affairs.
Term Offered: Spring, Summer, Fall

HED 6790 Managing College And University Personnel
[3 credit hours (0, 0, 3)]
This course acquaints students with key concepts related to the effective management of human resources within institutions of higher education. Topics covered may include human resource management, diversity and inclusion, talent management, training and development, employee engagement and retention, performance management, benefits and compensation, ethics and fair treatment, and collective bargaining in higher education.
Term Offered: Fall

HED 6810 Women In Higher Education
[3 credit hours (3, 0, 0)]
This course introduces students to the historical, social, and cultural influences on women’s higher education, and explores the campus climate for women as students, administrators, faculty, and governing board members. Special attention is paid to the intersections of gender with race and class.
Term Offered: Spring, Fall
HED 6820 Institutional Advancement In Higher Education  
[3 credit hours (3, 0, 0)]  
Overview of the field of development and introduction to the knowledge, research and theory emerging in the field. Focus on practical skill enhancement as it applies to building development programs.

HED 6830 The Independent College  
[3 credit hours (3, 0, 0)]  
The course examines the historical and conceptual underpinnings of the independent college and university. It explores the strengths, weaknesses, opportunities, and challenges of small residential liberal arts colleges, along with the other major categories of private colleges and universities in the American context.  
Term Offered: Summer

HED 6840 Adult Continuing Education  
[3 credit hours (3, 0, 0)]  
Course assists student in interpreting the highly diversified field of adult continuing education from the point of view of the student's current or anticipated involvement. Intended for teachers of adults.

HED 6850 Critical Issues In Higher Education  
[3 credit hours (3, 0, 0)]  
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 6870 Economic Development And Higher Education  
[3 credit hours (3, 0, 0)]  
How do institutions of higher education impact their local economies? This course examines various roles and methods by which institutions of higher education add to economic development.

HED 6910 Introduction to Interpretive Inquiry  
[3 credit hours (0, 0, 3)]  
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.

HED 6920 Master's Project In Higher Education  
[1-3 credit hours (0, 0, 0-1)]  
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

HED 6930 Master's Thesis In Higher Education  
[1-3 credit hours (0, 0, 0-1)]  
The Master’s Internship in Higher Education links directly to a student’s Graduate Assistantship and offers students the opportunity to integrate theory, research, and skills gained through courses, workshops, and seminars with the knowledge, skills, and abilities they are developing through practice. In addition, the Internship serves as structured professional development opportunity for enhancing theory-to-practice knowledge and skills of the students and practitioners involved. The HED Internship has been developed jointly by the HED Program and UT's Student Affairs, and includes the collaborative participation of both student affairs professionals and higher education faculty.

HED 6950 Master's Thesis In Higher Education  
[1-3 credit hours (0, 0, 0-1)]  
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 6960 Master's Thesis In Higher Education  
[1-3 credit hours (0, 0, 0-1)]  
This seminar formatted course will provide the opportunity to explore problems and issues from the perspectives of the various fields of education and of other disciplines related to higher education.

HED 6990 Independent Study In Higher Education-Masters  
[1-3 credit hours (0, 0, 0-3)]  
Each workshop is developed on a topic of interest to faculty members and administrators of higher education institutions. Practical applications of the workshop topic will be emphasized.

HED 7900 Diversity Leadership  
[3 credit hours (3, 0, 0)]  
Review and application of diversity work as it relates to leadership frameworks and media impacts. Topics include but are not limited to diversity team leadership types, diversity examined through interpersonal and mass communication lenses, and understanding the components of being an effective Chief Diversity Officer.  
Term Offered: Fall

HED 7910 Diversity Beginnings  
[3 credit hours (0, 0, 3)]  
Review and application of diversity-related theory, social and psychological understanding, and interpersonal communication when applying to diversity experiences.

HED 7930 Interdisciplinary Seminar  
[3 credit hours (3, 0, 0)]  
This seminar formatted course will provide the opportunity to explore problems and issues from the perspectives of the various fields of education and of other disciplines related to higher education.
HED 7960 Diversity in Practice  
[3 credit hours (0, 0, 3)]  
Review the different dimensions of diversity, understanding of laws that are in diversity-related areas, and exploration of diversity in a health care setting.

HED 7970 Diversity Advancement  
[3 credit hours (0, 0, 3)]  
Review and application of diversity work as it related to measurement and diversity analysis. Topic categories include but not limited to measuring diversity, creating climate surveys, developing diversity plans, and understanding the components of being an effective Chief Diversity Officer.

HED 7980 Special Topics In Higher Education  
[1-3 credit hours (0-3, 0, 0)]  
This seminar provides advanced study in special topics of interest to faculty and administrators in higher education.  
Term Offered: Summer, Fall

HED 8010 History Of Higher Education  
[3 credit hours (3, 0, 0)]  
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: Spring, Fall

HED 8020 Advanced Seminar In Historiography Hied  
[3 credit hours (3, 0, 0)]  
Historical methods applied to research in higher education discussed. Course focuses on in-depth readings of primary source material on liberal arts colleges, universities and community colleges. Research paper required.

HED 8030 Federal And State Policy Analysis  
[3 credit hours (3, 0, 0)]  
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 (0, 3, 0)]  
Complex interrelationships between global issues and educational 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 8210 The Community College  
[3 credit hours (3, 0, 0)]  
A study of the history, distinguishing characteristics (mission, functions, organization, curriculum, finances), and current issues facing community colleges, including marginalization of students and institutions, and transfer and articulation policy.  
Term Offered: Spring, Fall

HED 8250 Technical Higher Education  
[3 credit hours (3, 0, 0)]  
This course examines the development, mission, functions, and assessment of technical, occupational, and career education, including community needs assessment.

HED 8270 Learning and Teaching in Higher Education  
[3 credit hours (3, 0, 0)]  
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 8410 College & University Curriculum  
[3 credit hours (3, 0, 0)]  
The course examines the philosophical and conceptual underpinnings of college and university curriculum. It introduces a model for curriculum planning, implementation, and evaluation in American higher education, and a framework for designing and assessing courses and curricula.

HED 8440 General Education In Higher Education  
[3 credit hours (3, 0, 0)]  
This course will examine the meaning and purposes of general education in the United States. Students will become acquainted with the design, analysis and evaluation of general education curricula.

HED 8510 The American College Student  
[3 credit hours (3, 0, 0)]  
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: Summer

HED 8520 Org & Mgmt Of Student Affairs  
[3 credit hours (3, 0, 0)]  
This course provides an overview of functional areas of student affairs and the philosophies and ethics that guide the profession. The overview also considers general areas that influence student affairs such as university mission, campus culture and environment, leadership, financing and budgeting, university assessment, student demographics and diversity, and student development.  
Term Offered: Summer

HED 8530 Theories Of Student Development  
[3 credit hours (3, 0, 0)]  
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 8570 Research In Higher Education  
[3 credit hours (0, 0, 3)]  
"This course introduces students to various research approaches in the field of higher education. Students learn how to critique research articles in the field of higher education, how higher education institutions are classified, what national postsecondary datasets are available for their own research, and how to develop and present a research study proposal."

Term Offered: Spring, Fall

HED 8580 Leadership Theory  
[3 credit hours (0, 0, 3)]  
This seminar examines the theory and practice of leadership in higher education. Topics may include the leadership experience, leadership in engaging higher education in social change, and the roles of academic leaders.
HED 8610 Issues Of Access In Higher Education
[3 credit hours (3, 0, 0)]
This course explores access issues that result from the changing educational needs of society and analyzes the application of democratic ideals of American education to current educational policies affecting access.

HED 8630 Faculty Issues In Higher Education
[3 credit hours (3, 0, 0)]
This course explores current issues in the American academic profession. Topics may include faculty work, faculty reward systems, diversity issues, gender issues, salary issues, part-time faculty, work-home balance, governance, satisfaction, career choice, recruitment and retention, and faculty career stages.

HED 8640 Governance And Administration In Higher Education
[3 credit hours (3, 0, 0)]
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

HED 8650 Community College Leadership
[3 credit hours (0, 0, 3)]
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 8660 Building Academic Culture
[3 credit hours (3, 0, 0)]
An examination of institutional culture and the interplay of student, faculty and administrative subcultures. Critical perspectives are used to analyze and understand cultural inquiry, conflict and collaboration in post secondary institutions.

HED 8700 Finance Of Higher Education
[3 credit hours (3, 0, 0)]
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, Fall

HED 8710 Economics Of Higher Education
[3 credit hours (0, 0, 3)]
This course discusses issues related to the revenue sources of higher education and discussion of the social worth of public and private sector investment in higher education. Issues include the connection of educational outcomes to educational budget making and how sources of funds drive educational policymaking.

HED 8730 Legal Aspects Of Higher Education
[3 credit hours (3, 0, 0)]
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 8750 Strategic Planning And Decision Making
[3 credit hours (0, 0, 3)]
This course provides an overview and applications of strategic planning theories and methods in higher education and explores how external environments and internal dynamics affect planning processes. The development and implementation of strategic plans are covered as well as the leadership skills needed to direct strategic decision-making.

HED 8770 Evaluation And Outcomes Assessment In Higher Education
[3 credit hours (3, 0, 0)]
This course focuses on outcomes-based assessment of learning and development in student affairs.
Term Offered: Spring, Fall

HED 8790 Managing College And University Personnel
[3 credit hours (0, 0, 3)]
This course acquaints students with key concepts related to the effective management of human resources within institutions of higher education. Topics covered may include human resource management, diversity and inclusion, talent management, training and development, employee engagement and retention, performance management, benefits and compensation, ethics and fair treatment, and collective bargaining in higher education.
Term Offered: Spring, Fall

HED 8810 Women In Higher Education
[3 credit hours (3, 0, 0)]
This course introduces students to the historical, social, and cultural influences on women's higher education, and explores the campus climate for women as students, administrators, faculty, and governing board members. Special attention is paid to the intersections of gender with race and class.
Term Offered: Spring

HED 8820 Institutional Advancement In Higher Education
[3 credit hours (3, 0, 0)]
Overview of the field of development and introduction to the knowledge, research, and theory emerging in the field. Focus on practical skill enhancement as it applies to building development programs.

HED 8830 The Independent College
[3 credit hours (3, 0, 0)]
The course examines the historical and conceptual underpinnings of the independent college and university. It explores the strengths, weaknesses, opportunities, and challenges of small residential liberal arts colleges, along with the other major categories of private colleges and universities in the American context.
Term Offered: Summer

HED 8840 Adult Continuing Education
[3 credit hours (3, 0, 0)]
Course assists student in interpreting the highly diversified field of adult continuing education from the point of view of the student's current or anticipated involvement. Intended for teachers of adults.

HED 8850 Critical Issues In Higher Education
[3 credit hours (3, 0, 0)]
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 8870 Economic Development And Higher Education
[3 credit hours (3, 0, 0)]
How do institutions of higher education impact their local economies?
This course examines various roles and methods by which institutions of higher education add to economic development.

HED 8910 Introduction to Interpretive Inquiry
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 0-1)]
The Internship provides students an opportunity to accumulate 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 (0, 0, 0-1)]
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 (0, 0, 0-1)]
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 5010 Greek History
[3 credit hours (3, 0, 0)]
Selected topics on the political and social institutions of Greece in the classical and Hellenistic periods.
Term Offered: Fall

HIST 5020 Roman History
[3 credit hours (3, 0, 0)]
Selected topics on the political and social institutions of Rome during the Republic and Empire.
Term Offered: Spring

HIST 5030 Europe In The 14th-15th Centuries
[3 credit hours (3, 0, 0)]
The waning of the Middle Ages and the development of the Renaissance in Western Europe with emphasis on Italy.

HIST 5060 Age Of Absolutism
[3 credit hours (3, 0, 0)]
The growth and decline of the absolute monarchies in Europe and the development of a world market economy, c. 1550-1715.

HIST 5080 Age Of Revolution
[4 credit hours (4, 0, 0)]
The age of the French Revolution and Napoleon, c. 1785-1848.

HIST 5100 Europe Since World War I
[3 credit hours (3, 0, 0)]
Internal and international development of the major European states from World War I to the end of the twentieth century.

HIST 5150 Critics Of Victorian Society
[3 credit hours (3, 0, 0)]
Principal critics of society like Ruskin, Carlyle, Cobbett, Marx, Engels, Morris and Mill are read with a view to understanding capitalism, industrialism and England.

HIST 5170 The British Empire: For And Against
[3 credit hours (3, 0, 0)]
The emergence of England as a maritime power, as an empire, and as a financial force, with emphasis upon resistances and decolonization.
Term Offered: Fall

HIST 5200 Colonial Foundations Of The U.s.
[3 credit hours (3, 0, 0)]
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 5220 The American Revolution
[3 credit hours (3, 0, 0)]
The background and progress of the War for Independence.
Term Offered: Spring, Fall

HIST 5230 United States Early Republic
[3 credit hours (3, 0, 0)]
American politics and culture from the Federalist period to the Mexican-American War, 1789-1848.
Term Offered: Spring

HIST 5240 The Age Of Jackson
[3 credit hours (3, 0, 0)]
Jacksonian democracy in politics and as a reform movement; the sectional controversy; the Mexican-American War.

HIST 5250 Civil War And Reconstruction
[3 credit hours (3, 0, 0)]
Slavery and the Constitution in the sectional controversy, the political and military events of the Civil War, and the impact of the war on American society, 1848-1876.
Term Offered: Fall

HIST 5260 Emergence Of Modern America, 1876-1919
[3 credit hours (3, 0, 0)]
American society in the late 19th and early 20th centuries, including industrialization, urbanization, immigration, agrarian and labor revolts, politics, economic expansion, overseas initiatives, Progressive reform and involvement in World War I.
Term Offered: Spring

HIST 5270 20th Century America, 1920-1945
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 5310 History Of Native American Religious Movements
[3 credit hours (3, 0, 0)]
History of Native American revitalization movements as a response to European colonization and Indian dispossesssion.

HIST 5330 Western American Indians
[3 credit hours (3, 0, 0)]
Native Americans of the Far West from prehistoric times through recent years. Emphasis on European contact and governmental policies.
Term Offered: Spring

HIST 5340 Far Western Frontier
[3 credit hours (3, 0, 0)]
Native Americans; Spanish conquistadors and missionaries; American scientific and military exploration; mountain men and fur trade; international rivalries and Mexican War; gold rush of 49.

HIST 5360 American Intellectual History I
[3 credit hours (3, 0, 0)]
Development and influence of major ideas from the colonial period to 1865. Topics include Puritanism, the Enlightenment, Democracy and Transcendentalism.
Term Offered: Spring

HIST 5370 American Intellectual History II
[3 credit hours (3, 0, 0)]
Major developments in American thought from 1865, including Social Darwinism, pragmatism, ideological conflict, modern science, education.
Term Offered: Spring
HIST 5430 Slavery In America
[3 credit hours (3, 0, 0)]
Stresses the African continuum among slaves within the context of variations in goals and policies of slaveowners, slave trade, slave economics, demographics, slave labor and formation of slave culture. 
Term Offered: Spring, Summer

HIST 5450 United States and Latin America
[3 credit hours (3, 0, 0)]

HIST 5460 Women In American History
[3 credit hours (3, 0, 0)]
This course presents American history from early settlement to the present by examining the contributions of women, in interaction with men, to the immensely complex fabric of American life.

HIST 5470 Mexico
[3 credit hours (3, 0, 0)]
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 5480 American Labor And Working Class History
[3 credit hours (3, 0, 0)]
Development of working class communities, cultures, organizations and ideology from colonial era to the present. Topics include industrialization, unionization, labor law, gender and race constructions.

HIST 5490 Witchcraft And Magic In Medieval And Early Modern Europe
[3 credit hours (3, 0, 0)]
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

HIST 5530 History Of The Middle East Since 1500
[3 credit hours (3, 0, 0)]
History of the Middle East from the collapse of the Medieval Muslim States and the rise of the Ottoman Empire in the 16th century through the period of European intervention to the development of independent Middle Eastern States in the 20th century.
Term Offered: Spring, Fall

HIST 5620 Central Europe
[3 credit hours (3, 0, 0)]
Central Europe from medieval times to the present. The Habsburg Empire, Poland, the Balkans, twentieth-century changes.

HIST 5660 Imperial Russia, 1700-1917
[3 credit hours (3, 0, 0)]
Rise and fall of the Russian Empire. Politics and society from the time of Peter the Great to the 1917 Revolution.

HIST 5680 20th Century Russia
[3 credit hours (3, 0, 0)]
Russia from the 1917 Revolution to the present. Topics include Marxism, Communism, Stalinism, Cold War.

HIST 5720 Modern Chinese History
[3 credit hours (3, 0, 0)]
China in transition under the impact of the West; forces leading to the revolution of 1911, the Nationalists’ struggle, the emergence of the People’s Republic of China and aspects of post-revolutionary China. 
Term Offered: Spring

HIST 5740 Modern Japanese History
[3 credit hours (3, 0, 0)]
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

HIST 5750 Europe And Asia: Exploration And Exchange, 1415-1800
[3 credit hours (3, 0, 0)]
Motivation and process of European expansion to Africa and Asia from 1415-1800.

HIST 5790 The Holocaust
[3 credit hours (3, 0, 0)]
This advanced course deals with selected aspects of the history and memory of Nazi genocide against the Jews of Europe, with special emphasis on visual and survivor sources.
Term Offered: Spring

HIST 5830 Theory Of Public History
[3 credit hours (3, 0, 0)]
The definition, philosophy and evolution of public history as well as the current literature and debates within the field. Public history is the application of historical knowledge and methodology beyond academe.

HIST 5840 Public History Practicum
[3 credit hours (3, 0, 0)]
Course provides students with hands-on experience in the practice of public history by completing a project using specialized techniques, client-oriented research and teamwork. May be repeated for credit.

HIST 5940 Public History Internship
[2-4 credit hours (0-3, 0, 0)]
Supervised practical experience in the field of public history. 
Term Offered: Fall

HIST 5980 Special Topics
[1-4 credit hours (0-4, 0, 0)]
Topics selected by various instructors. 
Term Offered: Spring, Fall

HIST 6600 Historiography
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
Term Offered: Spring, Fall

HIST 6950 Workshops [3 credit hours (0, 0, 3)]
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: Spring, Fall

HIST 6960 Thesis [1-16 credit hours (0, 0, 0-6)]
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 (0, 0, 0-4)]
Term Offered: Spring, Summer, Fall

HIST 7980 Special Topics [1-4 credit hours (0-4, 0, 0)]
Term Offered: Fall

HIST 8600 Historiography [3 credit hours (3, 0, 0)]
The nature of historical writing. Concepts of the historical method. The history of the writing of history from the beginning to the present: 01: America 02: Asia 03: Europe 04: Latin America 05: Africa 06: Special Topics
Term Offered: Spring, Fall

HIST 8930 Seminar [3 credit hours (0, 0, 3)]
Term Offered: Spring, Fall

HIST 8950 Workshops [3 credit hours (0, 0, 3)]
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 (0, 0, 0-8)]
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 (0, 0, 0-4)]
Term Offered: Spring, Summer, Fall
HUMAN DONATION SCIENCE (HDSC)

HDSC 5010 Organ Transplant Procurement
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]

HDSC 5110 Fundamental Concepts and Clinical Practicum I
[3 credit hours (3, 0, 0)]
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 (0, 0, 0)]
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 (8, 0, 0)]
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 (6, 6, 0)]
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.
Corequisites: HDSC 5010, HDSC 5110
Term Offered: Spring, Summer, Fall

HDSC 5310 Clinical Aspects Procurement
[4 credit hours (4, 4, 0)]
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 (2, 0, 0)]
Selected topics that integrate learning and practice in human donation science.
Term Offered: Spring, Summer, Fall
HUMAN RESOURCE MANAGEMENT (HURM)

HURM 6700 Human Resource Management
[3 credit hours (3, 0, 0)]
A survey of the functions and current trends in human resource 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 6710 Employment And Labor Law
[3 credit hours (0, 0, 3)]
This course introduces the objectives, activities and practices involved in employment and labor law. It is designed for those pursuing careers in human resources or managers wishing to understand their responsibilities in this area.
Term Offered: Fall

HURM 6720 Advanced Negotiation and Conflict Management
[3 credit hours (0, 0, 3)]
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, Fall

HURM 6730 Performance Management
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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
Term Offered: Spring, Summer, Fall

HURM 6760 Talent Management
[3 credit hours (3, 0, 0)]
Talent management uses interconnected human resources to provide organizational benefits though developing a strategic approach to managing core talent encompassing recruiting, onboarding, training, performance management, and succession planning.
Prerequisites: HURM 6700
Term Offered: Spring, Fall

HURM 6800 Tools And Techniques In Human Resource Management
[3 credit hours (3, 0, 0)]
Course covers issues and techniques related to human resource planning, identifying and predicting HRM problems, and demonstrating the relationship between effective HRM practices and the bottom-line of the organization.
Prerequisites: (MGMT 5110 and HURM 6700)

HURM 8700 Human Resource Management
[3 credit hours (3, 0, 0)]
Introduces the objectives, activities, and practices involved in human resource management. Designed for both those pursuing careers in human resources or managers who wish to supplement their skills in this area. (Prerequisite: None)

HURM 8710 Employment and Labor Law
[3 credit hours (3, 0, 0)]
Introduces the objectives, activities, and practices involved in employment and labor law. Designed for those pursuing careers in human resources or managers wishing to understand their responsibilities in this area.

HURM 8720 Employer-Employee Relations
[3 credit hours (3, 0, 0)]
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.

HURM 8730 Performance Management
[3 credit hours (3, 0, 0)]
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.
Prerequisites: HURM 6700 and HURM 8700

HURM 8740 Human Resource Strategy and Metrics
[3 credit hours (3, 0, 0)]
Focuses on the integration of human resource strategies with the strategies of the firm. Students will learn how to assess and measure human resource processes, programs, and outcomes.
Prerequisites: HURM 6700 and HURM 8700
Term Offered: Spring

HURM 8750 Current Topics in Human Resource Management
[3 credit hours (3, 0, 0)]
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 and HURM 8700
Term Offered: Fall

HURM 8760 Recruitment and Retention
[3 credit hours (0, 0, 3)]
Talent management uses interconnected human resources to provide organizational benefits though developing a strategic approach to managing core talent encompassing recruiting, onboarding, training, performance management, and succession planning.
Prerequisites: HURM 8700
Term Offered: Fall
INFECT, IMMUN, TRANSPLANT (IITP)

IITP 6010 Infection Immunity Transplanta
[1 credit hour (1, 0, 0)]
The course will introduce fundamental knowledge of the immune system and its defense mechanisms and the nature and role of microbial pathogens in human and animal diseases.
Term Offered: Summer, Fall

IITP 8010 Infection Immunity Transplanta
[1 credit hour (1, 0, 0)]
The course will introduce fundamental knowledge of the immune system and its defense mechanisms and the nature and role of microbial pathogens in human and animal diseases.
Term Offered: Summer, Fall
INFORMATION SYSTEMS (INFS)

INFS 6150 Business Intelligence Management
[3 credit hours (3, 0, 0)]
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.

INFS 6460 Management Information Systems
[3 credit hours (3, 0, 0)]
This course is designed for end-users of computers to understand and appreciate the role of information technology and end-user's role in the management of this technology in organizations.

INFS 6560 Systems Analysis And Design
[3 credit hours (3, 0, 0)]
Concepts, tools, and techniques for information systems analysis, design and development will be discussed. Contemporary methodologies for systems development including CASE tools, prototyping and RAD project work will be included.
Prerequisites: BUAD 6800
Term Offered: Spring, Summer, Fall

INFS 6610 Information Storage And Retrieval Structures
[3 credit hours (3, 0, 0)]
This course will analyze the concepts and methods used in the management of organizational data resources. Covers data modeling, database design, administration and architecture. Hands-on applications of database development are provided.
Term Offered: Spring

INFS 6710 Management of Information Systems Security
[3 credit hours (3, 0, 0)]
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.

INFS 6750 Research In Information Systems, Operations Management Or Decision Sciences
[1-3 credit hours (0, 0, 0-1)]
Individual study of topics of common interest to both student and faculty member.
Term Offered: Spring, Summer, Fall

INFS 6780 ERP Systems Process Management
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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. 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 (3, 0, 0)]
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 (3, 0, 0)]
This seminar will focus on current topics in the fields of Information Systems and Operations Management.
Term Offered: Spring, Fall

INFS 8150 Business Intelligence Management
[3 credit hours (3, 0, 0)]
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.

INFS 8460 Management Information Systems
[3 credit hours (3, 0, 0)]
This course is designed for end-users of computers to understand and appreciate the role of information technology and end-user's role in the management of this technology in organizations.

INFS 8480 Information Systems Issues In Manufacturing
[4 credit hours (4, 0, 0)]
This course examines theoretical frameworks and recent empirical research of information and manufacturing technology. Emphasis will be on developing an integrative perspective of both technologies.

INFS 8710 Management of Information Systems Security
[3 credit hours (3, 0, 0)]
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

INFS 8760 IS Research Seminar I
[3 credit hours (0, 0, 3)]
This course covers the full spectrum of IS research on technology adoption models and the adoption and diffusion of innovations in information technology. We examine the Technology Acceptance Model, TAM II, the Unified Theory of the Acceptance and Use of Technology and UTAUT 2. We also examine the literature on technology acceptance beyond the dominant paradigm of technology acceptance.
INFS 8770 IS Research Seminar II
[3 credit hours (0, 0, 3)]
This course covers the rich vein of IS research that falls outside the Technology Acceptance Model or quantitative positivist research genre. These include examining questions of IT strategy and the value of IT to business firms. The value of IT to the organization has been approached using various theoretical lenses.

INFS 8930 Contemporary Topics Seminar-Outsourcing
[3 credit hours (3, 0, 0)]
The course will address issues in planning for, implementing and managing or just working in, outsourcing projects. PhD. students enrolled in 8930 will be assigned additional readings and required to complete a research paper.

Term Offered: Spring, Fall

INFS 8990 Integrative Seminar in IT
[3 credit hours (3, 0, 0)]
The seminar will investigate managerial issues in the field of information systems and technology management.

Term Offered: Spring, Summer, Fall
**INTERDISCIPLINARY (INDI)**

**INDI 5050 Medical Science Practicum**  
[0-10 credit hours (0-10, 0, 0)]  
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 (6, 0, 0)]  
This course provides basic knowledge of anatomy and physiology.

**INDI 5200 Cellular and Molecular Biology**  
[11 credit hours (0, 0, 0)]  
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 (3, 0, 0)]

**INDI 5350 Pathophysiology of Organ Systems**  
[2-10 credit hours (2-10, 0, 0)]  
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 (7, 0, 0)]  
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 (3, 0, 0)]  
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 (4, 0, 0)]  
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 (3, 0, 0)]  
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 (1, 0, 1)]  
A series of one-hour lectures dealing with the ethics, regulations, and issues facing a modern, biomedical research scientist.  
Term Offered: Spring, Summer, Fall

**INDI 6280 Intro to Global Medicine**  
[3 credit hours (0, 0, 0)]  
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 6730 Research Biomedical Science**  
[0-15 credit hours (0, 0-15, 0-15)]  
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit.  
Term Offered: Spring, Summer, Fall

**INDI 6790 Basic and Adv Light Microscopy**  
[4 credit hours (0, 4, 4)]  
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: Fall

**INDI 6860 Electron Microscopy**  
[4 credit hours (4, 0, 0)]  
A lecture/laboratory course in the standard theories and techniques employed in biological transmission and scanning electron microscopy.

**INDI 6920 Readings in Population Health**  
[1 credit hour (1, 0, 1)]  
This is an interdisciplinary course in which students will read and discuss articles in primary and other literature that will address cultural competence, health communications, critical reading of medical and health studies and other relevant topics.

**INDI 6980 Scholarly Project for Medical Sciences**  
[0-10 credit hours (0, 0, 0)]  
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 (0, 1-15, 0)]  
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 (0, 0, 3)]  
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 (1, 0, 1)]  
A series of one-hour lectures dealing with the ethics, regulations, and issues facing a modern, biomedical research scientist.  
Term Offered: Spring, Summer, Fall  

INDI 8280 Intro To Global Medicine  
[3 credit hours (0, 0, 0)]  
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 (0, 0-15, 0-15)]  
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 (0, 4, 0)]  
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: Fall  

INDI 8860 Electron Microscopy  
[4 credit hours (4, 4, 0)]  
A lecture/laboratory course in the standard theories and techniques employed in biological transmission and scanning electron microscopy.
INTERNATIONAL BUSINESS (IBUS)

IBUS 6100 Study Abroad Program
[3 credit hours (0, 0, 3)]
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 6360 Management Of Multinational Firms
[3 credit hours (3, 0, 0)]
Analysis of the multinational firm, emphasizing the differences with domestic enterprises, with respect to strategic planning and capital allocation, marketing, production, supply, personnel and contract negotiation.
Term Offered: Spring, Fall

IBUS 6990 Independent Study
[1-3 credit hours (0, 0, 0-3)]
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

IBUS 8490 Global Management Systems
[3 credit hours (3, 0, 0)]
Compares the management philosophies, systems and methods of U.S. firms with those of firms from other countries, particularly the management system of Japanese, German and other nationality firms that are competitors of U.S. firms. Ph.D. students are assigned additional readings from the academic literature.

IBUS 8790 International Business Research Seminar
[3 credit hours (0, 0, 3)]
A seminar in selected topics in International Business. PhD. students are assigned readings from the International Business academic literature. They will complete several research papers focusing on specific topics that advance the field and that are suitable for submission to an academic journal or conference.
Term Offered: Spring, Fall
KINESIOLOGY (KINE)

KINE 5110 Measurement And Statistical Inference In Human Performance
[3 credit hours (3, 0, 0)]
Application of measurement and statistical inference to human performance testing and research. Includes descriptive and inferential statistics, principles of test construction and introduction to authentic assessment in public schools.
Term Offered: Spring

KINE 5250 Readings In Exercise Biology
[3 credit hours (0, 0, 3)]
Faculty and student directed readings of original research in Exercise Biology. Readings will focus on how changes in physical activity influence the biology of skeletal muscle.
Term Offered: Spring, Fall

KINE 6010 Clinical Applications I
[1 credit hour (0, 0, 1)]
Clinical skill experience is provided to develop autonomous athletic trainer and provide exposure to implementing evidence based practice in clinical practice.

KINE 6020 Clinical Applications II
[1 credit hour (0, 0, 1)]
Continue to develop autonomous athletic training skills built upon in Clinical Applications I and continue to advance diagnosis, treatment and intervention skills.
Prerequisites: KINE 6010

KINE 6030 Clinical Applications III
[2 credit hours (2, 0, 0)]
Advanced integration of clinical skills with the introduction of mentoring athletic training students in a clinical setting.
Prerequisites: KINE 6020

KINE 6040 Clinical Applications IV
[2 credit hours (2, 0, 0)]
Preparation of autonomous athletic training care for the transition into an occupation in sports medicine.
Prerequisites: KINE 6030

KINE 6100 Physiology Of Exercise
[3 credit hours (3, 0, 0)]
This course is designed to provide an understanding of the mechanisms of the physiological responses to exercise. Emphasis will be placed on adaptations to exercise training and the role of exercise in health and disease.
Term Offered: Fall

KINE 6120 Evaluation and Management of Lower Extremity Injury
[4 credit hours (3, 1, 0)]
The study of the pathology, etiology and presentation of lower extremity injuries. Subjective and objective components as well as orthopedic special testing will be introduced and serve as the foundation for the formulation of a systematic evaluation method. In addition, acute management techniques include first aid as well as immobilization methods will be introduced. Laboratory concepts include selection and implementation of appropriate evaluation and acute management techniques.
Prerequisites: KINE 6140 and KINE 6150

KINE 6130 Biomechanics Of Human Motion
[3 credit hours (3, 0, 0)]
This course provides a basic overview of the principles of biomechanics as they apply to human movement. In-depth discussion and lab activities focus on the application of these principles to such topics as muscle function, locomotion, balance, mechanisms of injury and ergonomics.
Term Offered: Spring, Fall

KINE 6140 Functional Musculoskeletal Anatomy
[3 credit hours (1, 2, 0)]
A cadaver anatomy course focusing on foundation concepts of structural kinesiology and anatomy. In addition, the structure of various musculoskeletal tissues and functional joint complexes will be examined.

KINE 6200 Biomechanical Instrumentation
[3 credit hours (3, 0, 0)]
Provides students with experience in the research and clinical use of videography, force and pressure plates, electromyography and other systems in applied biomechanics. Emphasis on hands-on lab experience and topics related to data collection and signal processing.
Prerequisites: KINE 6130
Term Offered: Spring

KINE 6220 Evaluation and Management of Upper Extremity Injury
[4 credit hours (3, 1, 0)]
The study of the pathology, etiology and presentation of upper extremity injuries common in active populations. Subjective and objective components as well as orthopedic special testing will be introduced and serve as the foundation for the formulation of a systematic evaluation method. In addition, acute management techniques include first aid as well as immobilization methods will be introduced. Laboratory concepts include selection and implementation of appropriate evaluation and acute management techniques.
Prerequisites: KINE 6210 and KINE 6610

KINE 6230 Scientific Writing And Research Methods
[3 credit hours (3, 0, 0)]
Principles and issues involved in the design and conduct of research in exercise science: critical evaluation, research design, development of a research proposal, grant acquisition, and compliance with institutional and federal guidelines on the use of humans and animals.
Term Offered: Fall

KINE 6310 Therapeutic Interventions I
[3 credit hours (2, 1, 0)]
The study of the physiological, mechanical and bio-electrical principles related to the application of thermal, electrical and mechanical modalities in the treatment of musculoskeletal injury. Laboratory concepts include selection and application of appropriate modality use specific to patient values and situation.
Prerequisites: KINE 6140 and KINE 6150

KINE 6410 Clinical Biomechanics
[2 credit hours (1, 1, 0)]
The study of common kinematic and kinetic alterations that can occur following acute and chronic musculoskeletal injuries and the deleterious effects these changes can cause. In addition, students will be introduced to both laboratory and clinical techniques to assess and alter the kinematic and kinetic deficits associated with injury.
Prerequisites: KINE 6210 and KINE 6610
Term Offered: Spring
KINE 6420 Cardiopulmonary Exercise Physiology
[3 credit hours (3, 0, 0)]
The responses and adaptations of the cardiovascular and pulmonary systems to exercise in healthy individuals.
Prerequisites: KINE 6100
Term Offered: Spring

KINE 6430 Environmental Physiology
[3 credit hours (3, 0, 0)]
Physiological responses and adaptations to extreme environments.
Term Offered: Fall

KINE 6440 Readings in Cardiovascular Physiology
[3 credit hours (0, 0, 3)]
This is a faculty directed examination of current research in Cardiovascular Physiology. Emphasis is placed on the role of physical activity on the prevention and/or treatment of cardiovascular treatment
Term Offered: Spring, Fall

KINE 6510 Evaluation and Management of General Medical Conditions
[3 credit hours (2, 1, 0)]
The study of the pathology, etiology and presentation of common general medical conditions in active populations. Systems will include cardiovascular, respiratory, gastrointestinal, genitourinary, reproductive, dermatologic and neurologic systems and infectious diseases. For each system, subjective and objective components as well as common special tests will be introduced. In addition, concepts of pharmacology including pharmacokinetics, basic drug classifications and legal aspects of use will be covered. Specific focus will be placed on common therapeutic drugs used in sports medicine.
Prerequisites: KINE 620

KINE 6540 Laboratory Techniques In Exercise Physiology
[3 credit hours (1, 2, 0)]
This course covers theoretical and practical knowledge for the assessment of exercise metabolism, cardiorespiratory function, body composition, thermoregulation and skeletal muscle function. Hands-on data collection will be emphasized.
Term Offered: Fall

KINE 6550 Lab Techniques In Exercise Biology
[3 credit hours (3, 0, 0)]
The course provides students with theoretical and practical knowledge for assessing cellular and molecular responses to exercise and inactivity. Emphasis will be placed on laboratory safety, reagent preparation, cell culture techniques, and tissue analysis.
Prerequisites: (KINE 6100 and KINE 6540)

KINE 6600 Issues And Management In Athletic Training
[3 credit hours (3, 0, 0)]
This course addresses current issues that affect the profession of Athletic Training. Topics cover issues that influence clinical practice as well as political issues related to the profession.
Term Offered: Spring, Fall

KINE 6610 Clinical Skills I
[2 credit hours (2, 0, 0)]
The first of sequential courses that focuses on development of professional behaviors and review of concepts and skills from previous coursework. In addition, clinical education rotations provided will allow students to implement course material into a clinical setting and gain practical hands-on experience working under the supervision of a certified athletic trainer.
Prerequisites: KINE 6150 and KINE 6140

KINE 6630 Clinical Skills III
[2 credit hours (2, 0, 0)]
The third of sequential courses that focuses on development of professional behaviors and review of concepts and skills from previous coursework. In addition, clinical education rotations provided will allow students to implement course material into a clinical setting and gain practical hands-on experience working under the supervision of a Certified Athletic Trainer.
Prerequisites: KINE 6620

KINE 6640 Clinical Skills IV
[2 credit hours (2, 0, 0)]
The final of sequential courses that focuses on development of professional behaviors and review of concepts and skills from previous coursework. In addition, clinical education rotations provided will allow students to implement course material into a clinical setting and gain practical hands-on experience working under the supervision of a Certified Athletic Trainer.
Prerequisites: KINE 6630

KINE 6660 Evidence-Based Practice in Sports Medicine
[2 credit hours (2, 0, 0)]
This course will introduce the student to clinical epidemiology and the evaluation of the efficacy of prevention, diagnosis, and treatment strategies in athletic training and sports medicine.
Term Offered: Fall

KINE 6670 Pathology of Orthopedic Injury
[3 credit hours (3, 0, 0)]
An in-depth investigation into the basic structure and mechanisms of injury of various musculoskeletal tissue applied to the recognition and prevention of specific orthopedic injuries and conditions.
Term Offered: Spring, Fall

KINE 6680 Advanced Interventions I
[2 credit hours (2, 0, 0)]
Students will be introduced to advanced techniques that impact clinical practice in Athletic Training, including manual therapy, advanced orthopedic evaluation s, and advanced management and planning related to emergency medicine.
Term Offered: Spring

KINE 6690 Advanced Interventions II
[3 credit hours (2, 1, 0)]
Students will be introduced to advanced evaluation and assessment techniques that impact clinical practice, including general medical conditions, psychosocial, professionalism, and profession advocacy.
Prerequisites: KINE 6680
KINE 6720 Advanced Clinical Anatomy
[2 credit hours (0, 2, 0)]
A cadaver anatomy course focusing on the extremities. Emphasis will be placed on the link between anatomical structure, orthopedic injuries, and clinical practice.
Term Offered: Fall

KINE 6730 Optimization of Performance and Wellness
[3 credit hours (3, 0, 0)]
An investigation into the nutritional and psychological components of optimal performance and wellness in active populations as well as recognition and appropriate referral of patients with suspected substance abuse and mental health disorders. In addition, concepts related to wellness and fitness assessment and weight management in a healthy population including prescription of strengthening and conditioning exercises will be discussed.
Prerequisites: KINE 6630

KINE 6810 Scholarly Project I
[1 credit hour (0, 1, 0)]
The first of sequential courses designed to provide students hands-on engagement in clinical research and scholarship related to the athletic training field. Students will work with course instructor and or research advisor to develop a clinical question and begin to design a research project related that question.
Prerequisites: KINE 6500 and KINE 6610

KINE 6820 Scholarly Project II
[1 credit hour (0, 1, 0)]
The second of sequential courses designed to provide students hands-on engagement in clinical research and scholarship related to the athletic training field. Students will work with course instructor and or research advisor to carry out a research project including but not limited to recruitment of subjects, data collection and data analysis.
Prerequisites: KINE 6800 and KINE 6620

KINE 6910 Introduction to Sports Medicine Research I
[1 credit hour (1, 0, 0)]
Students will be introduced to sports medicine research with a focus on evaluating the literature, asking a clinically relevant research question, and developing experimental hypotheses.

KINE 6920 Introduction to Sports Medicine Research II
[1 credit hour (1, 0, 0)]
Students will continue to develop the ability to critique research and will be introduced to developing research methods to address a clinically question related to sports medicine.
Prerequisites: KINE 6910

KINE 6960 Masters Thesis In Exercises Science
[1-4 credit hours (0, 0, 0-3)]
Independence research in Exercise Science completed as part of the requirements for the Master of Science in Exercise Science degree.
Term Offered: Spring, Summer, Fall

KINE 6990 Independent Study In Exercise Science
[1-4 credit hours (0, 0, 0-4)]
Faculty supervised independent reading, laboratory research, field experience and other activities not suited for class instruction.
Term Offered: Spring, Summer, Fall

KINE 6710 Measurement And Statistical Inference In Human Performance
[3 credit hours (3, 0, 0)]
Application of measurement and statistical inference to human performance testing and research. Includes descriptive and inferential statistics, principles of test construction and introduction to authentic assessment in public schools.
Term Offered: Spring

KINE 7250 Readings In Exercise Biology
[3 credit hours (0, 0, 3)]
Faculty and student directed readings of original research in Exercise Biology. Readings will focus on how changes in physical activity influence the biology of skeletal muscle.
Term Offered: Spring, Fall

KINE 8100 Physiology Of Exercise
[3 credit hours (3, 0, 0)]
This course is designed to provide an understanding mechanisms of the physiological responses to exercise. Emphasis will be placed on adaptations to exercise training and the role of exercise in health and disease.
Term Offered: Fall

KINE 8130 Biomechanics Of Human Motion
[3 credit hours (3, 0, 0)]
This course provides a basic overview of the principles of biomechanics as they apply to human movement. In-depth discussion and lab activities focus on the application of these principles to such topics as muscle function, locomotion, balance, mechanisms of injury and ergonomics.
Term Offered: Spring, Fall

KINE 8200 Biomechanical Instrumentation
[3 credit hours (3, 0, 0)]
Provides students with experience in the research and clinical use of videography, force and pressure plates, electromyography and other systems in applied biomechanics. Emphasis on hands-on lab experience and topics related to data collection and signal processing.
Prerequisites: KINE 6130 or KINE 8130
Term Offered: Spring

KINE 8230 Scientific Writing And Research Methods
[3 credit hours (3, 0, 0)]
Principles and issues involved in the design and conduct of research in exercise science: critical evaluation, research design, development of a research proposal, grant acquisition, and compliance with institutional and federal guidelines on the use of humans and animals.
Term Offered: Fall

KINE 8420 Cardiopulmonary Exercise Physiology
[3 credit hours (3, 0, 0)]
The responses and adaptations of the cardiovascular and pulmonary systems to exercise in healthy individuals.
Prerequisites: KINE 8100
Term Offered: Spring

KINE 8430 Environmental Physiology
[3 credit hours (3, 0, 0)]
Physiological responses and adaptations to extreme environments.
Term Offered: Fall
KINE 8460 Readings in Cardiovascular Physiology
[3 credit hours (0, 0, 3)]
This is a faculty directed examination of current research in Cardiovascular Physiology. Emphasis is placed on the role of physical activity on the prevention and/or treatment of cardiovascular diseases.

Prerequisites: KINE 8100
Term Offered: Spring, Fall

KINE 8540 Laboratory Techniques In Exercise Physiology
[3 credit hours (1, 2, 0)]
This course covers theoretical and practical knowledge for the assessment of exercise metabolism, cardiorespiratory function, body composition, thermoregulation and skeletal muscle function. Hands-on data collection will be emphasized.

Term Offered: Fall

KINE 8550 Lab Techniques In Exercise Biology
[3 credit hours (3, 0, 0)]
The course provides students with theoretical and practical knowledge for assessing cellular and molecular responses to exercise and inactivity. Emphasis will be placed on laboratory safety, reagent preparation, cell culture techniques, and tissue analysis.

Prerequisites: (KINE 8100 and KINE 8540)

KINE 8600 Issues And Management In Athletic Training
[3 credit hours (3, 0, 0)]
This course addresses current issues that affect the profession of Athletic Training. Topics cover issues that influence clinical practice as well as political issues related to the profession.

Term Offered: Fall

KINE 8660 Evidence-Based Practice in Sports Medicine
[3 credit hours (3, 0, 0)]
An investigation into the science and theories of therapeutic rehabilitation and its impact on clinical practice using current literature and databases from the areas of evidence based medicine.

Term Offered: Fall

KINE 8670 Pathology of Orthopedic Injury
[3 credit hours (3, 0, 0)]
An in-depth investigation into the basic structure and mechanisms of injury of various musculoskeletal tissue applied to the recognition and prevention of specific orthopedic injuries and conditions.

Term Offered: Spring, Fall

KINE 8720 Anatomical Concepts for Clinical Practice
[3 credit hours (0, 0, 2)]
A cadaver anatomy course focusing on the extremities. Emphasis will be placed on the link between anatomical structure, orthopedic injuries, and clinical practice.

Term Offered: Fall

KINE 8960 Doctoral Dissertation In Exercise Science
[1-12 credit hours (0, 0, 0-12)]
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

KINE 8990 Independent Study In Exercise Science
[1-4 credit hours (0, 0, 0-4)]
Faculty supervised independent reading, laboratory research, field experience and other activities not suited for class instruction.

Term Offered: Spring, Summer, Fall
LATIN (LAT)

LAT 5210 Latin For Reading Knowledge I
[3 credit hours (3, 0, 0)]
Elements of grammar and vocabulary appropriate to preparing graduate students to read effectively in Latin.

LAT 5220 Latin For Reading Knowledge II
[3 credit hours (3, 0, 0)]
Elements of pronunciation, structure and vocabulary most appropriate to preparing graduate students to read effectively in Latin.
LAW (BAR-TESTED) (LAWG)

LAWG 6010 Business Associations
[4 credit hours (4, 0, 0)]
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: LAW 5000 (may be taken concurrently)

LAWG 6110 Commercial Paper
[3 credit hours (3, 0, 0)]
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: LAW 6210 and LAW 5000 (may be taken concurrently)

LAWG 6210 Criminal Procedure - Investigations
[3 credit hours (3, 0, 0)]
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: LAW 5000 (may be taken concurrently)
Term Offered: Spring, Fall

LAWG 6280 Criminal Procedure - Adjudications
[3 credit hours (3, 0, 0)]
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: LAW 5000 (may be taken concurrently)

LAWG 6610 Secured Transactions
[3 credit hours (3, 0, 0)]
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: LAW 6210 and LAW 5000 (may be taken concurrently)

LAWG 6710 Trusts and Estates
[3-4 credit hours (0-4, 0, 0)]
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: LAW 5000 (may be taken concurrently)
LAW (BASIC FIRST-YR REQUIRED) (LAWD)

LAWD 6020 Civil Procedure - Pleading and Practice
[3 credit hours (3, 0, 0)]
Study of the rules controlling the management of civil litigation. State and federal systems are covered.
Prerequisites: LAWM 5000 (may be taken concurrently)
Term Offered: Spring, Fall

LAWD 6110 Constitutional Law - Structure
[3 credit hours (3, 0, 0)]
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)
Term Offered: Spring, Summer

LAWD 6210 Contracts I
[3 credit hours (3, 0, 0)]
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)
Term Offered: Spring, Fall

LAWD 6220 Contracts II
[3 credit hours (3, 0, 0)]
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)
Term Offered: Spring, Summer

LAWD 6300 Criminal Law
[4 credit hours (4, 0, 0)]
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)
Term Offered: Spring

LAWD 6410 Property - Fundamentals of Ownership
[3 credit hours (3, 0, 0)]
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)
Term Offered: Fall

LAWD 6420 Property - Transactions and Land Use
[3 credit hours (3, 0, 0)]
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)

LAWD 6510 Torts
[4 credit hours (4, 0, 0)]
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)
Term Offered: Summer, Fall

LAWD 6750 Lawyering Skills I
[2-3 credit hours (0, 0, 0-3)]
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)
Term Offered: Spring, Fall

LAWD 6760 Lawyering Skills II
[1-2 credit hours (0, 0, 0-3)]
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)
LAW (CLINICS AND SKILLS) (LAWN)

LAWN 6000 Trial Practice
[3 credit hours (0, 0, 3)]
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

LAWN 6020 Advanced Legal Research
[2-3 credit hours (0-3, 0, 0)]
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)

LAWN 6030 Law Practice
[1-3 credit hours (0, 0, 0-3)]
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)

LAWN 6050 Negotiation and Settlement
[2-3 credit hours (0-3, 0, 0)]
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)

LAWN 6100 Negotiation: Theory and Strategy
[3 credit hours (3, 0, 0)]
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)

LAW 6110 Advanced Trial Practice
[2 credit hours (2, 0, 0)]
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 and (LAWN 6000 or LAWL 6180)

LAWN 6130 Criminal Law Integration
[2-3 credit hours (0-3, 0, 0)]
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

LAWN 6190 Interviewing and Counseling
[2-3 credit hours (0-3, 0, 0)]
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)

LAWN 6310 Criminal Law Practice Program
[4-6 credit hours (0, 0, 0-6)]
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

LAWN 6330 Advanced Criminal Law Practice Program
[3-4 credit hours (0, 0, 0-4)]
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
LAWN 6410 Dispute Resolution Clinic
[2-4 credit hours (0, 0, 0-4)]
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: LAWN 6000 (may be taken concurrently)

LAWN 6420 Advanced Dispute Resolution Clinic
[2-4 credit hours (0, 0, 0-4)]
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

LAWN 6610 Public Service Externship
[1-6 credit hours (0, 0, 0-6)]
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)

LAWN 6910 Civil Advocacy Clinic
[2-6 credit hours (0, 0, 0-6)]
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)

LAWN 6930 Advanced Civil Advocacy Clinic
[2-4 credit hours (0, 0, 0-4)]
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

LAWN 6940 Children's Rights Clinic
[3-6 credit hours (0, 0, 0-6)]
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)

LAWN 6950 Advanced Children's Rights Clinic
[2-4 credit hours (0, 0, 0-4)]
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
LAW (ELECTIVES) (LAWI)

LAWI 6000 International Comparative Law
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6010 Accounting and Financial Statements
[1-3 credit hours (0-3, 0, 0)]
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)

LAWI 6020 E-Commerce
[1-3 credit hours (0-3, 0, 0)]
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)

LAWI 6030 Administrative Law
[3 credit hours (3, 0, 0)]
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)
Term Offered: Spring, Fall

LAWI 6060 Sales and Leases of Goods
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6070 Antitrust
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6080 Gender and the Law
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6090 Disability Law
[2-3 credit hours (2-3, 0, 0)]
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 (3, 0, 0)]
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)

LAWI 6110 Education Law
[1-3 credit hours (0-3, 0, 0)]
This course will explore the legal, practical and policy implications of the law surrounding education, both primary and secondary education. The course will cover a wide variety of topics, including: the legal and financial structure of education; the boundaries between public and private education and between church and state; school governance; the constitutional and statutory rights of students (including issues of discrimination, affirmative action, harassment and individuals with disabilities); and the constitutional and statutory rights of teacher. Throughout the course, we will explore the important but perhaps unanswerable question: What is good education and does the law help or hinder its achievement?
Prerequisites: LAWM 5000 (may be taken concurrently)
LAWI 6130 Business Enterprise Tax
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6170 Conflict of Laws
[2-3 credit hours (0-3, 0, 0)]
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.
Prerequisites: LAWM 5000 (may be taken concurrently)

LAWI 6200 Jurisprudence
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6210 Copyright Law
[2-3 credit hours (0-3, 0, 0)]
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)
Term Offered: Spring

LAWI 6220 Constitutional Litigation
[2-3 credit hours (0-3, 0, 0)]
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

LAWI 6270 Creditor and Debtor Law
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6300 Employment Discrimination
[3 credit hours (3, 0, 0)]
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)
Term Offered: Spring, Fall

LAWI 6310 Employment Law
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6320 Environmental Law
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6340 Elder Law
[2-3 credit hours (0-3, 0, 0)]
This course focuses on clients’ legal needs at all stages of life, including special issues related to aging and end of life. Emphasis is placed on the application of law in aging and end of life contexts.
Prerequisites: LAWM 5000 (may be taken concurrently)

LAWI 6350 Estate and Gift Tax
[2-3 credit hours (0-3, 0, 0)]
A study of the federal estate and gift tax structure and its impact on the generation skipping transfer tax are also discussed.
Prerequisites: LAWM 5000 (may be taken concurrently)

LAWI 6360 Estate and Gift Tax
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6370 Family Law
[3 credit hours (3, 0, 0)]
The interaction of law and the family and the consequences of state intervention in family relationships. Some of the subjects surveyed are the marriage relationship, de facto marriage, adoption, the termination of marital status, economic consequences of divorce, child custody after divorce and the role of the lawyer as counselor.
Prerequisites: LAWM 5000 (may be taken concurrently)
Term Offered: Spring, Fall
LAWI 6380 Federal Courts and Federal Rights
[3 credit hours (3, 0, 0)]
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)

LAWI 6390 Natural Resources Law
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6400 American Legal History
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6440 Immigration Law
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6460 Insurance Law
[2-3 credit hours (2-3, 0, 0)]
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)
Term Offered: Summer

LAWI 6470 Intellectual Property and Licensing
[2-3 credit hours (0-3, 0, 0)]
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 or LAWI 6710 or LAWI 6720 or LAWI 6900)

LAWI 6480 International Business Transactions
[2-3 credit hours (0-3, 0, 0)]
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)
Term Offered: Spring

LAWI 6490 Juvenile Law
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6500 Federal Income Tax
[3-4 credit hours (3-4, 0, 0)]
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)
LAWI 6510 Labor Law
[3 credit hours (3, 0, 0)]
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 remedied for NLRA violations.
Prerequisites: LAWM 5000 (may be taken concurrently)

LAWI 6520 Health Care Finance
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6530 Consumer Law
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6550 Health Care Fraud and Abuse
[2-3 credit hours (0-3, 0, 0)]
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 health 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

LAWI 6560 Real Estate Transactions
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6570 Health Care Provider Liability
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6630 Health Law
[3 credit hours (3, 0, 0)]
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)
Term Offered: Spring, Fall

LAWI 6680 State and Local Government Law and Taxation
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6710 Patent Law
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6715 Pension and Employee Benefits
[2-3 credit hours (0-3, 0, 0)]
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)
Term Offered: Spring, Fall

LAWI 6719 Patent Practice and Procedure
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6720 Intellectual Property Survey
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6723 Pension and Employee Benefits
[2-3 credit hours (0-3, 0, 0)]
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)
Term Offered: Spring
LAWI 6750 Products Liability
[2-3 credit hours (0-3, 0, 0)]
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 and LAWD 6510 and LAWM 5000 (may be taken concurrently)

LAWI 6780 Remedies
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6790 Bar Exam Preparation
[2-3 credit hours (0-3, 0, 0)]
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 pass/fail basis.
Prerequisites: LAWM 5000 (may be taken concurrently)

LAWI 6800 Securities Regulation
[2-3 credit hours (0-3, 0, 0)]
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 and LAWG 6010

LAWI 6810 Sentencing
[2-3 credit hours (0-3, 0, 0)]
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 and LAWD 6300 and LAWD 6110

LAWI 6820 Land Use Planning
[2-3 credit hours (0-3, 0, 0)]
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)

LAWI 6840 International and Domestic Arbitration
[2-3 credit hours (0-3, 0, 0)]
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

Term Offered: Summer

LAWI 6870 Sports Law
[2-4 credit hours (0-4, 0, 0)]
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)

LAWI 6880 Business Bankruptcy
[2-3 credit hours (0-3, 0, 0)]
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

LAWI 6900 Trademarks
[2-3 credit hours (0-3, 0, 0)]
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)
LAWI 6930 Water Law
[2-3 credit hours (0-3, 0, 0)]
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: LAW 5000 (may be taken concurrently)

LAWI 6940 White Collar Crime
[2-3 credit hours (0-3, 0, 0)]
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: LAW 5000 and LAW 6300
LAW (LAW REVW AND MOOT COURT) (LAWL)

LAWL 6110 Law Review I
[1-2 credit hours (0, 0, 0-2)]
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)

LAWL 6120 Law Review II
[1-2 credit hours (0, 0, 0-2)]
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

LAWL 6150 Moot Court I
[1-2 credit hours (0, 0, 0-3)]
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)

LAWL 6160 Moot Court II
[1-2 credit hours (0, 0, 0-3)]
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

LAWL 6180 Trial Advocacy I
[1-2 credit hours (0-2, 0, 0)]
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)

LAWL 6190 Trial Advocacy II
[1-2 credit hours (0-2, 0, 0)]
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
LAW (MASTERS PROGRAM) (LAWM)

LAWM 5000 Law And The Legal System
[2-3 credit hours (2-3, 0, 0)]
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 (0-6, 0, 0)]  
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 (3, 0, 0)]
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)

LAWA 6010 Civil Procedure - Jurisdiction
[3 credit hours (3, 0, 0)]
Study of the rules controlling the jurisdiction of courts. State and federal systems are covered.
Prerequisites: LAWM 5000

LAWA 6120 Constitutional Law - Rights
[3 credit hours (3, 0, 0)]
Constitutional Law - Rights will cover issues of individual rights protected by the Equal Protection Clause of the fourteenth Amendment. It will also cover First Amendment protections against governmental restrictions of speech and the press, with some coverage of First Amendment protections of religion.
Prerequisites: LAWM 5000 (may be taken concurrently)
Term Offered: Spring

LAWA 6310 Evidence
[4 credit hours (4, 0, 0)]
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)
Term Offered: Spring

LAWA 6400 Advanced Research and Writing
[1 credit hour (0, 0, 1)]
This course involves an advanced writing project completed under the supervision of a full-time faculty member.
Term Offered: Spring, Summer, Fall
LAW (WRITING AND INDEPENDENT RESEARCH) (LAWP)

LAWP 6000 Seminar
[2-3 credit hours (0, 0, 0-3)]
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)
Term Offered: Spring, Summer

LAWP 6010 Honors Research I
[2 credit hours (0, 0, 2)]
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

LAWP 6020 Honors Research II
[2 credit hours (0, 0, 2)]
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 (0, 0, 2)]
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)
Term Offered: Spring
LEGAL SPECIALTIES (LGL)

LGL 6100 Legal Issues for the Elderly
[3 credit hours (0, 0, 0)]
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 6200 Elderly Health Law and Ethical
[3 credit hours (0, 0, 0)]
A study of elder health law and elder legal and ethical issues affecting our aging population including home, long term and hospice care, guardianship, housing, age discrimination and elder abuse.
Term Offered: Summer, Fall

LGL 6300 Introduction to Patient Advocacy
[3 credit hours (0, 0, 0)]
An introduction to public and private health care delivery systems in the US. Basic legal and ethical issues are presented as they impact the provider and recipient of health care.
Term Offered: Fall

LGL 6400 Health Issues Patient Advocacy
[3 credit hours (0, 0, 0)]
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 6500 Legal Issues in Patient Advocacy
[3 credit hours (0, 0, 0)]
This course will focus on how the U.S. legal system functions and how it impacts health care institutions and the patients they serve.
Term Offered: Fall

LGL 6600 Guided Study Patient Advocacy
[3 credit hours (0, 0, 0)]
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 (0, 0, 0)]
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 5100 History Of The English Language
[3 credit hours (3, 0, 0)]
Study of the origins and development of the English language.
Prerequisites: ENGL 3150 or LING 3150 or ENGL 5150 or LING 5150 or ENGL 7150 or LING 7150
Term Offered: Spring, Summer, Fall

LING 5110 Old English
[3 credit hours (3, 0, 0)]
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: Fall

LING 5120 Middle English
[3 credit hours (3, 0, 0)]
Study of the phonology, morphology and syntax of Middle English, with special attention to literary and cultural background. Representative readings in verse and prose.

LING 5150 Fundamentals Of Linguistics
[3 credit hours (3, 0, 0)]
Formal techniques required for the synchronic and diachronic study of language.
Term Offered: Spring, Fall

LING 5190 Sociolinguistics
[3 credit hours (3, 0, 0)]
Combines linguistic and societal concerns through empirical research.
Term Offered: Spring, Fall

LING 5210 Issues In Esl Writing
[3 credit hours (0, 0, 3)]
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

LING 5430 Approaches to English As A Second Language
[3 credit hours (0, 0, 3)]
Examination of a broad range of approaches to the teaching of English as a Second Language, including how these approaches fit into different theoretical assumptions and how they are implemented in practice.
Term Offered: Spring

LING 5980 Special Topics
[3 credit hours (3, 0, 0)]
A graduate course on a special topic. Consult Time Schedule for topic to be studied, prerequisite(s), and semester offered.
Term Offered: Spring, Fall

LING 6150 Applied Linguistics I
[3 credit hours (3, 0, 0)]
Focus on the methods of applied linguistics in the broad sense, through case studies including research on first and second language acquisition, language teaching, the teaching of reading and writing, and other related areas.
Prerequisites: LING 5150 or ENGL 5150
Term Offered: Fall
MGMT 5110 Introduction To Management
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
The 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: Fall

MGMT 6160 Leading With Power and Influence
[3 credit hours (3, 0, 0)]
Students will develop an understanding of the strategic use of power and influence to exercise leadership in organizations. Skill development in the diagnosis and practical use of power and influence to mobilize action, to negotiate, and to resolve conflicts will be emphasized.
Term Offered: Spring, Fall

MGMT 6190 Leading change and Organizational Improvement
[3 credit hours (3, 0, 0)]
Students will learn and apply the key theories and practices of change management and organizational development processes.
Term Offered: Spring

MGMT 6930 Independent Research
[1-3 credit hours (0, 0, 0-3)]
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 8480 Management of Technology [3 credit hours (3, 0, 0)]
This seminar covers conceptual framework and relevant research studies on technology management. The literature from Technology Management as it relates to the management of product, manufacturing and supply chain technologies will be discussed.
Term Offered: Spring, Fall

MFGM 8490 Supply Chain and E-Business Issues in Manufacturing [3 credit hours (3, 0, 0)]
This seminar focuses broadly on key issues relating effective management of product, information and financial flows in supply chains. It also relates to E-business practices, and their impact on supply chain design and management.
Term Offered: Spring

MFGM 8510 Supply Chain and Technology Management Analytics [3 credit hours (3, 0, 0)]
This course focuses on advanced analytical methods and applications in supply chain and technology management. The first part of the course focuses on mathematical modeling and algorithms in supply chain management, while the second part focuses on how to use data to develop business insights and predictive capabilities.

MFGM 8630 Management Science [3 credit hours (3, 0, 0)]
This course is an applied study of deterministic and stochastic methods of management science. A variety of applications with emphasis on manufacturing and technology management are introduced.
Term Offered: Spring

MFGM 8640 Advanced Management Science [3 credit hours (0, 0, 3)]
The course introduces students to advanced theory, algorithms, and applications of management science techniques, including dynamic programming, nonlinear programming, game theory, etc. The methods have applications to supply chain management, manufacturing, transportation, marketing, and economics.

MFGM 8650 Stochastic Modeling [3 credit hours (0, 0, 3)]
This course covers basic principles and methods in applied probability and stochastic modeling. The topics covered in this course include advanced probably theory, stochastic processes, Markov chains, Markov Decision Processes, queuing theory, computer simulation, etc. Applications of these techniques in supply chain management, manufacturing, transportation, and finance are introduced.

MFGM 8660 Qualitative Research Methodology [3 credit hours (0, 0, 3)]
This course explores the use of qualitative methods within the fields of Information Systems and Operations Management. The seminar discusses the different qualitative methods that include Case Study, Ethnography, and Grounded Theory. In addition, we examine the differences between interpretive and positivist approaches using qualitative methods. This course covers research design and the various techniques in analyzing qualitative data. The course includes a discussion about mitigating bias in the areas of data collection and analysis.

MFGM 8670 Special Topics in Research Methods [3 credit hours (0, 0, 3)]
This course focuses on contemporary research methods within the fields of manufacturing and technology management, including Operations and Supply Chain Management, Information Systems, etc. The specific topic on contemporary research methods will change each time.

MFGM 8810 Seminar/Colloquium [1 credit hour (0, 0, 1)]
One credit hour requirement of these courses will be met by requiring the students to attend a reasonable number (10) of research seminars and colloquia in and outside the college, doctoral dissertation proposal and defenses at the college, etc., during one academic year.
Term Offered: Spring, Fall

MFGM 8840 Manufacturing Strategy [4 credit hours (4, 0, 0)]
The seminar examines the theory and research related to the formulation and implementation of manufacturing strategy including the strategic planning process and techniques for industry and competitive analysis.
Prerequisites: MGMT 5110 or ORGD 7110

MFGM 8850 Readings And Research In Manufacturing Management [1-12 credit hours (0, 0, 0-1)]
This individually designed course will provide advanced readings in areas needed by a doctoral student.
Term Offered: Spring, Summer, Fall

MFGM 8860 Advanced Statistics [3 credit hours (3, 0, 0)]
This course discusses multivariate data analysis. Topics include: principal components analysis, factor analysis, multidimensional scaling, cluster analysis, multiple regression analysis and multivariate analysis of variance. Statistical software packages are used.
Prerequisites: OPMT 5510
Term Offered: Summer, Fall

MFGM 8870 Seminar in Statistics/ Research Method [3 credit hours (3, 0, 0)]
This is an advanced second course in Statistical methods or management science or research methods. This course is designed for individual needs of the student to provide more depth in the research method as required.
Term Offered: Summer
MFGM 8880 Research Methods-Theory Bldg
[3 credit hours (3, 0, 0)]
The course seeks to frame and discuss key issues that arise as social scientists conduct theoretically-relevant empirical research. In the course, the theory building in manufacturing management as well as research process and the literature, tools and techniques associated with each phase of the process will be introduced.
Term Offered: Fall

MFGM 8890 Advanced Manufacturing Systems
[3 credit hours (3, 0, 0)]
This seminar provides an understanding of the design and management of manufacturing systems. This begins with an understanding of how manufacturing has evolved over time, continues with descriptions of current trends and ideas in manufacturing system design and concludes with discussion of future changes,
Term Offered: Spring, Summer, Fall

MFGM 8900 Field Research
[1-8 credit hours (0, 0, 0-4)]
This course provides students with the opportunity to experience a realistic manufacturing problem and to develop approaches to solving that problem under the supervision of a faculty member.
Term Offered: Spring, Fall

MFGM 8960 Dissertation
[1-8 credit hours (0, 0, 0-8)]
Dissertation
Term Offered: Spring, Summer, Fall

MFGM 8980 Special Topics Seminar
[3 credit hours (3, 0, 0)]
This seminar focuses on current topics relating to manufacturing and technology management. The specific seminar topic will change each semester.
Term Offered: Spring, Fall
MARKETING (MKTG)

MKTG 5170 Marketing For Non-Profit Organizations
[3 credit hours (3, 0, 0)]
This course is an introduction to marketing for non-business students. Focus is on planning and executing marketing programs in not-for-profit organization. It is an accelerated look into marketing principles which focuses on the opportunities, challenges, and constraints confronting managers in not-for-profit settings – health care institutions, schools, churches, arts and community service organizations in the governmental and private sectors.
Term Offered: Spring, Fall

MKTG 5410 Marketing Systems
[3 credit hours (3, 0, 0)]
Examines the areas of marketing management, marketing functions and institutions, and the role of marketing in the organization. The course explores the relationship between marketing and the environment.
Term Offered: Spring, Summer, Fall

MKTG 6140 Customer Relationship Marketing
[3 credit hours (3, 0, 0)]
Course will examine the theoretical and managerial development of relationship marketing as an organizational strategy to build and maintain profitable customer relationships.
Prerequisites: BUAD 3010 or MKTG 5410
Term Offered: Summer, Fall

MKTG 6220 Integrated Marketing Communications
[3 credit hours (3, 0, 0)]
Course focuses on the integration of marketing communication tools in achieving desired changes in consumer attitudes and behaviors. This involves analyzing the competitive environment, defining the communications strategy and selecting media and vehicles to ensure consistency of messages and complementary use of media in order to maximize the impact on consumers.
Prerequisites: MKTG 5410 or BUAD 3010
Term Offered: Summer, Fall

MKTG 6230 Digital Marketing Processes and Virtual Value Networks
[3 credit hours (0, 0, 3)]
Course will examine how marketing processes can leverage e-commerce opportunities to create greater customer value in relational and transactional exchanges, and to build virtual value networks spanning functional, organizational and geographical boundaries.
Prerequisites: MKTG 5410 or BUAD 3010
Term Offered: Spring

MKTG 6240 Sales Force Leadership and Strategy
[3 credit hours (3, 0, 0)]
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 or BUAD 3010
Term Offered: Spring, Summer, Fall

MKTG 6250 Global Sales and Strategic Customer Management
[3 credit hours (3, 0, 0)]
In today's global business environment, it has become a strategic necessity for salespeople to take an approach centered on developing customer relationships. This course examines the roles and functions of the business-to-business salesperson in managing customers in a global environment and considered strategic to meeting organizational goals. Students will participate in critical thinking exercises, case study, and role play to develop skills in relationship selling, and strategic customer management of global firms.
Prerequisites: MKTG 5410 or BUAD 3010
Term Offered: Spring

MKTG 6310 Managing Innovation and Product Commercialization
[3 credit hours (3, 0, 0)]
Course will provide an understanding of how new products and services are designed and commercialized, and will take a strategic and managerial perspective in defining how to best plan, lead, and develop the processes of managing innovation and new products/services.
Prerequisites: BUAD 3010 or MKTG 5410

MKTG 6320 Strategic Brand Management
[3 credit hours (3, 0, 0)]
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.
Prerequisites: MKTG 5410 or BUAD 3010
Term Offered: Spring, Summer, Fall

MKTG 6400 International Marketing
[3 credit hours (3, 0, 0)]
This course focuses on identifying (via screening) and servicing foreign market opportunities via the export modality. Skills in research, strategic and tactical analysis, and adaptation are developed.
Prerequisites: BUAD 3010 or MKTG 5410
Term Offered: Spring, Fall

MKTG 6980 Special Topics
[3 credit hours (0, 0, 3)]
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 (0, 0, 0-3)]
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

MKTG 8240 Sale Force Leadership and Strategy
[3 credit hours (3, 0, 0)]
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.
MKTG 8250 Strategic Account Management
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MKTG 8290 Business Marketing
[3 credit hours (3, 0, 0)]
Nature, structure, and managerial problems and processes in the field of business-to-business marketing.
Prerequisites: MKTG 5410 or MKTG 7410

MKTG 8310 Managing Innovation and Product Commercialization
[3 credit hours (0, 0, 3)]
Course will provide an understanding of how new products and services are designed and commercialized, and will take a strategic and managerial perspective in defining how to best plan, lead, and develop the processes of managing innovation and new products/services.
Prerequisites: MKTG 5410
Term Offered: Spring

MKTG 8320 Strategic Brand Management
[3 credit hours (3, 0, 0)]
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.
Prerequisites: MKTG 5410
Term Offered: Spring

MKTG 8400 International Marketing
[3 credit hours (3, 0, 0)]
This course focuses developing an eclectic knowledge of the literature on identifying and servicing foreign market opportunities. Research skills dealing with literature synthesis, concept development, testing, data collection and academic paper writing are developed.
Prerequisites: BUAD 6500

MKTG 8790 Integrated Marketing/CRM Seminar
[3 credit hours (0, 0, 3)]
A seminar in selected topics in Marketing. Ph.D. students are assigned readings from the Marketing academic literature. They will complete several research papers focusing on specific topics that advance the field and that are suitable for submission to an academic journal or conference.
Term Offered: Spring, Fall
MASTER OF LIBERAL STUDIES (MLS)

MLS 6010 MLS Seminar in Humanities
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 0-6)]
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 (0, 0, 0-6)]
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 (0, 0, 0-6)]
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 (0, 0, 0-12)]
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 (1-6, 0, 0)]
Creative or applied capstone project supervised by faculty advisor and committee.
Term Offered: Spring, Summer, Fall

MLS 6990 Mls Thesis
[1-6 credit hours (0, 0, 0-6)]
Permission of the Director required. May be repeated for additional credit.
Term Offered: Spring, Summer, Fall
MATH 5010 Functions And Modeling For Middle Grade Mathematics
[3 credit hours (3, 0, 0)]
Introduction to the theory of functions through modeling. Subjects include polynomial, exponential, logarithmic and rational functions, interpolation and modeling of data sets though least squares and other methods. Graduate math credit for education students only.

MATH 5040 Concepts Of Calculus For Middle Grade Mathematics
[3 credit hours (3, 0, 0)]
Introduction to the basic idea of calculus. Subjects include limits, continuity, the derivative and its applications, indefinite and definite integral, Fundamental Theorem of Calculus, evaluation of integrals. Graduate math credit for education students only.

Term Offered: Summer

MATH 5060 Number Theory Concepts For Middle Grade Mathematics
[3 credit hours (3, 0, 0)]
Introduction to basic number theory. Subjects include history of number theory, prime numbers, unique factorization, Euclidean algorithm, Pythagorean relations, number systems, and transformations. Graduate math credit for education students only.

MATH 5070 Geometry Concepts For Middle School Mathematics
[3 credit hours (3, 0, 0)]
Descriptive geometry in 2 and 3 dimensions, use of axioms and definitions in the proof theorems, formal Euclidean geometry, transformations. Graduate math credit for education students only.

MATH 5080 History Of Mathematics For Middle Grade Mathematics
[3 credit hours (3, 0, 0)]
Study of the history of mathematics from antiquity to the 20th century concentrating on the development of arithmetic, algebra, geometry and calculus. Graduate math credit for education students only.

MATH 5110 Probability Concepts For Middle Grade Mathematics
[3 credit hours (3, 0, 0)]
Introduction to the theory of probability, counting principles and combinatorics, risk, coincidence, expectation and conditional probability, probability distributions. Graduate math credit for education students only.

MATH 5120 Statistics Concepts For Middle Grade Mathematics
[3 credit hours (3, 0, 0)]
Introduction to the fundamental ideas of statistics, including sampling techniques, descriptive, variance, confidence intervals, correlation and regression. Graduate math credit for education students only.

MATH 5220 Theory Of Interest
[3 credit hours (3, 0, 0)]
This course covers the measurement of interest, certain annuities, yield rates, amortization and sinking funds, bonds and other securities and application of interest theory.

MATH 5260 Actuarial Mathematics I
[3 credit hours (3, 0, 0)]
Survival distributions and life tables, life insurance, life annuities, benefit premiums and reserves and multiple life functions are some topics covered in this course.

Prerequisites: MATH 5680
Term Offered: Fall
MATH 5540 Classical Differential Geometry I
[3 credit hours (3, 0, 0)]
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 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 3860 or MATH 2860

MATH 5550 Classical Differential Geometry II
[3 credit hours (3, 0, 0)]
Tensors, vector fields and the Cartan approach to surface theory. Bonnet's Theorem and the equations of surfaces. Theorems of a global nature such as Hilbert's Theorem or the Theorem of Hopf-Rinow.

MATH 5600 Advanced Statistical Methods I
[3 credit hours (3, 0, 0)]
Basics of descriptive statistics, study designs and statistical inference. Properties of estimators and hypothesis testing. 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
Term Offered: Fall

MATH 5610 Advanced Statistical Methods II
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MATH 5620 Linear Statistical Models
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MATH 5630 Theory And Methods Of Sample Surveys
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring, Fall

MATH 5640 Statistical Computing
[3 credit hours (3, 0, 0)]
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 5650 Introduction To Theory Of Probability
[3 credit hours (3, 0, 0)]
Probability spaces, random variables, probability distributions, moments and moment generating functions, limit theorems, transformations and sampling distributions.
Prerequisites: MATH 3190 and MATH 5350
Term Offered: Summer, Fall

MATH 5660 Introduction To Mathematical Statistics
[3 credit hours (3, 0, 0)]
Sampling distributions, point estimation, interval estimation, hypothesis testing, regression and analysis of variance.
Prerequisites: MATH 5680
Term Offered: Spring

MATH 5710 Methods Of Numerical Analysis I
[3 credit hours (3, 0, 0)]
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.

MATH 5720 Methods Of Numerical Analysis II
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MATH 5730 Advanced Applied Mathematics I
[3 credit hours (3, 0, 0)]
Prerequisites: MATH 3860 or MATH 2860
Term Offered: Fall

MATH 5740 Advanced Applied Mathematics II
[3 credit hours (3, 0, 0)]
Continuation of vector analysis, introduction to complex analysis, partial differential equations, Fourier series and integrals.
Prerequisites: MATH 5740
Term Offered: Spring
MATH 5780 Advanced Calculus  
[3 credit hours (3, 0, 0)]  
Extrema for functions of one or more variables, Lagrange multipliers,  
determinate forms, inverse and implicit function theorems, uniform  
convergences, power series, transformations, Jacobians, multiple  
integrals.  
Prerequisites: MATH 2850  

MATH 5800 Ordinary Differential Equations  
[3 credit hours (3, 0, 0)]  
Modern theory of differential equations; transforms and matrix methods;  
existence theorems and series solutions; and other selected topics.  
Prerequisites: MATH 2860  
Term Offered: Spring, Fall  

MATH 5810 Partial Differential Equations  
[3 credit hours (3, 0, 0)]  
First and second order equations; numerical methods; separation of  
variables; solutions of heat and wave equations using eigenfunction  
techniques; and other selected topics.  
Prerequisites: MATH 3860 or MATH 2860  
Term Offered: Spring  

MATH 5820 Introduction To Real Analysis I  
[3 credit hours (3, 0, 0)]  
A rigorous treatment of the Calculus in one and several variables. Topics  
to include: the real number system; sequences and series; elementary  
metric space theory including compactness, connectedness and  
completeness; the Riemann Integral.  
Prerequisites: MATH 3190  
Term Offered: Fall  

MATH 5830 Introduction To Real Analysis II  
[3 credit hours (3, 0, 0)]  
Differentiable functions on Rn; the Implicit and Inverse Function  
Theorems; sequences and series of continuous functions; Stone-  
Weierstrass Theorem; Arzela-Ascoli Theorem; introduction to measure  
theory; Lebesgue integration; the Lebesgue Dominated Convergence  
Theorem.  
Prerequisites: MATH 5820  
Term Offered: Spring  

MATH 5840 Calculus Of Variations And Optimal Control Theory I  
[3 credit hours (3, 0, 0)]  
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  
Term Offered: Fall  

MATH 5850 Calculus Of Variations And Optimal Control Theory II  
[3 credit hours (3, 0, 0)]  
Pontryagin's maximum principle; necessary and sufficient conditions for  
optimal control, controllability, time optimal control, existence of optimal  
controls, relationship to the calculus of variations.  
Prerequisites: MATH 5860  
Term Offered: Fall  

MATH 5860 Complex Variables  
[3 credit hours (3, 0, 0)]  
Analytic functions; Cauchy's theorem; Taylor and Laurent series;  
residues; contour integrals; conformal mappings, analytic continuation  
and applications.  
Prerequisites: MATH 2860  
Term Offered: Spring, Summer  

MATH 5870 Industrial Math Practicum  
[1 credit hour (0, 0, 1)]  
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 5880 Topics In Mathematics  
[3 credit hours (3, 0, 0)]  
Special topics in mathematics.  
Term Offered: Spring, Summer  

MATH 6180 Linear And Nonlinear Programming  
[3 credit hours (3, 0, 0)]  
Simplex algorithm, ellipsoidal algorithm, Karmarkar's method, interior  
point methods, elementary convex analysis, optimality conditions and  
duality for smooth problems, convex programming, algorithms and their  
convergence.  
Prerequisites: MATH 5820  

MATH 6190 Infinite Dimensional Optimization  
[3 credit hours (3, 0, 0)]  
Introduction to nonlinear analysis, abstract optimization problems on  
abstract spaces, applications to calculus of variations, optimal control  
theory and game theory.  

MATH 6300 Algebra I  
[3 credit hours (3, 0, 0)]  
Field extensions, Galois theory, modules, Noetherian and Artinian rings,  
tensor products, primitive rings, semisimple rings and modules, the  
Wedderburn-Artin theorem.  
Prerequisites: MATH 6300  
Term Offered: Spring  

MATH 6310 Algebra II  
[3 credit hours (3, 0, 0)]  
Group actions, Sylow's theorems, permutation groups, nilpotent and  
solvable groups, abelian groups, rings, unique factorization domains,  
fields.  
Prerequisites: MATH 5340  
Term Offered: Fall  

MATH 6400 Topology I  
[3 credit hours (3, 0, 0)]  
Topological spaces, continuous functions, compactness, product spaces,  
Tychonov's theorem, quotient spaces, local compactness, homotopy  
theory, the fundamental group, covering spaces.  
Prerequisites: MATH 4450 or MATH 5450 or MATH 7450  
Term Offered: Fall
MATH 6410 Topology II
[3 credit hours (3, 0, 0)]
Homology theory, excision, homological algebra, the Brouwer fixed point theorem, cohomology, differential manifolds, orientation, tangent bundles, Sard's theorem, degree theory.
Prerequisites: MATH 6400
Term Offered: Spring

MATH 6440 Differential Geometry I
[3 credit hours (3, 0, 0)]
Introduction to differential geometry. Topics include differentiable manifolds, vector fields, tensor bundles, the Frobenius theorem, Stokes' theorem, Lie groups.
Prerequisites: MATH 6410
Term Offered: Fall

MATH 6450 Differential Geometry II
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MATH 6500 Ordinary Differential Equations
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Topics include the flow-box theorem, Poincare maps, attractors, w limit sets, Lyapunov stability, invariant submanifolds, Hamiltonian systems and symplectic manifolds.
Prerequisites: MATH 6500

MATH 6530 Dynamical Systems II
[3 credit hours (3, 0, 0)]
Topics may include local bifurcations of vector fields, global stability, ergodic theorems, integrable systems, symbolic dynamics, chaos theory.
Prerequisites: MATH 6520

MATH 6600 Statistical Consulting
[1-5 credit hours (1-5, 0, 0)]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience. May be repeated for credit.
Term Offered: Spring, Fall

MATH 6610 Statistical Consulting II
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Important methods and modeling techniques using generalized linear models and emphasizing loglinear and logit modeling.
Prerequisites: MATH 5680
Term Offered: Spring, Fall

MATH 6630 Nonparametric Statistics
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring, Fall

MATH 6640 Topics In Statistics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Estimation, hypothesis testing, prediction, sufficient statistics, theory of estimation and hypothesis testing, simultaneous inference, decision theoretic models.
Prerequisites: MATH 5680
Term Offered: Fall

MATH 6670 Measure Theoretic Probability
[3 credit hours (3, 0, 0)]
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
Term Offered: Fall

MATH 6680 Theory Of Statistics
[3 credit hours (3, 0, 0)]
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 or (MATH 6650 and MATH 6670)
Term Offered: Spring

MATH 6690 Multivariate Statistics
[3 credit hours (3, 0, 0)]
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 or MATH 6650
Term Offered: Spring
MATH 6720 Methods Of Mathematical Physics I
[3 credit hours (3, 0, 0)]
Analytic functions, residues, method of steepest descent, complex
differential equations, regular singularities, integral representation, real
and complex vector spaces, matrix groups, Hilbert spaces, coordinate
transformations.
Term Offered: Fall

MATH 6730 Methods Of Mathematical Physics II
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MATH 6800 Real Analysis I
[3 credit hours (3, 0, 0)]
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 or MATH 5830
Term Offered: Fall

MATH 6810 Real Analysis II
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MATH 6820 Functional Analysis I
[3 credit hours (3, 0, 0)]
Topics include Topological vector spaces, Banach spaces, convexity, the
Hahn-Banach theorem, weak and strong topologies, Lp spaces and duality.
Prerequisites: MATH 6810
Term Offered: Fall

MATH 6830 Functional Analysis II
[3 credit hours (3, 0, 0)]
Topics include the Mackey-Arens Theorem, Banach algebras, spectra in
Banach algebras, commutative Banach algebras, unbounded operators,
the spectral theorem, topics in functional analysis.
Prerequisites: MATH 6820
Term Offered: Spring

MATH 6840 Complex Analysis I
[3 credit hours (3, 0, 0)]
Elementary analytic functions, complex integration, the residue theorem,
infinite sequences of analytic functions, Laurent expansions, entire
functions.
Prerequisites: MATH 6800
Term Offered: Fall

MATH 6850 Complex Analysis II
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MATH 6860 Measure Theoretic Probability I
[3 credit hours (3, 0, 0)]
Focus on measure theory and probability. Measures and their extensions,
integration, convergence theorems, product measures. Probability
spaces, random variables and distribution functions, independence,
expectation, law of large numbers, central limit theorem, zero-one laws,
characteristic functions.
Prerequisites: MATH 5680
Corequisites: MATH 6800

MATH 6930 Colloquium
[1 credit hour (0, 0, 1)]
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 (0, 0, 0-4)]
Problems and techniques of teaching elementary college mathematics,
supervised teaching, seminar in preparation methods.
Term Offered: Spring, Fall

MATH 6960 Master Thesis
[3-6 credit hours (0, 0, 0-3)]

MATH 6980 Topics In Mathematical Sciences
[3 credit hours (0, 0, 3)]
Special topics in Mathematics or Statistics.
Term Offered: Spring, Summer, Fall

MATH 6990 Readings In Mathematics
[1-5 credit hours (0, 0, 0-5)]
Readings in areas of Mathematics of mutual interest to the student and
the professor.
Term Offered: Spring, Summer, Fall

MATH 7300 Linear Algebra I
[3 credit hours (3, 0, 0)]
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 7310 Linear Algebra II
[3 credit hours (3, 0, 0)]
Hermitian and normal operators, multilinear forms, spectral theorem and
other topics.
Prerequisites: MATH 5300
MATH 7330 Abstract Algebra I  
[3 credit hours (3, 0, 0)]  
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. 
Prerequisites: MATH 3190  
Term Offered: Fall

MATH 7340 Abstract Algebra II  
[3 credit hours (3, 0, 0)]  
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  
Term Offered: Spring

MATH 7350 Applied Linear Algebra  
[3 credit hours (3, 0, 0)]  
Matrices, systems of equations, vector spaces, linear transformations, determinants, eigenvalues and eigenvectors, generalized inverses, rank, numerical methods and applications to various areas of science. 
Prerequisites: MATH 3320 or MATH 5330  
Term Offered: Fall

MATH 7380 Discrete Structures And Analysis Algorithms  
[3 credit hours (3, 0, 0)]  
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 or MATH 5330  
Term Offered: Fall

MATH 7450 Introduction To Topology I  
[3 credit hours (3, 0, 0)]  
Metric spaces, topological spaces, continuous maps, bases and sub-bases, closure and interior operators, products, subspaces, sums, quotients, separation axioms, compactness and local compactness. 
Prerequisites: MATH 3190  
Term Offered: Fall

MATH 7460 Introduction To Topology II  
[3 credit hours (3, 0, 0)]  
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  
Term Offered: Spring

MATH 7450 Classical Differential Geometry I  
[3 credit hours (3, 0, 0)]  
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. 
Prerequisites: MATH 3860 or MATH 2860

MATH 7540 Classical Differential Geometry II  
[3 credit hours (3, 0, 0)]  
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

MATH 7600 Advanced Statistical Methods I  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]  
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  
Term Offered: Spring

MATH 7620 Linear Statistical Models  
[3 credit hours (3, 0, 0)]  
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  
Term Offered: Spring

MATH 7630 Theory And Methods Of Sample Surveys  
[3 credit hours (3, 0, 0)]  
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  
Term Offered: Spring

MATH 7640 Statistical Computing  
[3 credit hours (3, 0, 0)]  
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 (3, 0, 0)]
Probability spaces, random variables, probability distributions, moments and moment generating functions, limit theorems, transformations and sampling distributions.
Prerequisites: MATH 3190
Term Offered: Fall

MATH 7690 Introduction To Mathematical Statistics
[3 credit hours (3, 0, 0)]
Sampling distributions, point estimation, interval estimation, hypothesis testing, regression and analysis of variance.
Prerequisites: MATH 5680
Term Offered: Spring

MATH 7710 Methods Of Numerical Analysis I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring

MATH 7740 Advanced Applied Mathematics I
[3 credit hours (3, 0, 0)]
Prerequisites: MATH 3860 or MATH 2860
Term Offered: Fall

MATH 7750 Advanced Applied Mathematics II
[3 credit hours (3, 0, 0)]
Continuation of vector analysis, introduction to complex analysis, partial differential equations, Fourier series and integrals.
Prerequisites: MATH 5740
Term Offered: Spring

MATH 7800 Ordinary Differential Equations
[3 credit hours (3, 0, 0)]
Modern theory of differential equations; transforms and matrix methods; existence theorems and series solutions; and other selected topics.
Prerequisites: MATH 3860 or MATH 2860
Term Offered: Fall

MATH 7810 Partial Differential Equations
[3 credit hours (3, 0, 0)]
First and second order equations; numerical methods; separation of variables; solutions of heat and wave equations using eigenfunction techniques; and other selected topics.
Prerequisites: MATH 3860 or MATH 2860
Term Offered: Spring

MATH 7820 Introduction To Real Analysis I
[3 credit hours (3, 0, 0)]
A rigorous treatment of the Calculus in one and several variables. Topics to include: the real number system; sequences and series; elementary metric space theory including compactness, connectedness and completeness; the Riemann integral.
Prerequisites: MATH 3190
Term Offered: Fall

MATH 7830 Introduction To Real Analysis II
[3 credit hours (3, 0, 0)]
Differentiable functions on Rn; the Implicit and Inverse Function Theorems; sequences and series of continuous functions; Stone-Weierstrass Theorem; Arzelà-Ascoli Theorem; introduction to measure theory; Lebesgue integration; the Lebesgue Dominated Convergence Theorem.
Prerequisites: MATH 5820
Term Offered: Spring

MATH 7860 Calculus Of Variations And Optimal Control Theory I
[3 credit hours (3, 0, 0)]
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.
Prerequisites: MATH 5820

MATH 7870 Calculus Of Variations And Optimal Control Theory II
[3 credit hours (3, 0, 0)]
Pontryagin's maximum principle; necessary and sufficient conditions for optimal control, controllability, time optimal control, existence of optimal controls, relationship to the calculus of variations.
Prerequisites: MATH 5860

MATH 7880 Complex Variables
[3 credit hours (3, 0, 0)]
Analytic functions; Cauchy's theorem; Taylor and Laurent series; residues; contour integrals; conformal mappings, analytic continuation and applications.
Prerequisites: MATH 3860
Term Offered: Spring

MATH 7980 Topics In Mathematics
[3 credit hours (3, 0, 0)]
Special topics in mathematics.

MATH 8180 Linear And Nonlinear Programming
[3 credit hours (3, 0, 0)]
Simplex algorithm, ellipsoidal algorithm, Karmarkar's method, interior point methods, elementary convex analysis, optimality conditions and duality for smooth problems, convex programming, algorithms and their convergence.
Prerequisites: MATH 5820 or MATH 7820

MATH 8190 Infinite Dimensional Optimization
[3 credit hours (3, 0, 0)]
Introduction to nonlinear analysis, abstract optimization problems on abstract spaces, applications to calculus of variations, optimal control theory and game theory.
Prerequisites: MATH 6150 or MATH 6810 or MATH 8150 or MATH 8810
MATH 8300 Algebra I
[3 credit hours (3, 0, 0)]
Group actions, Sylow's theorems, permutation groups, nilpotent and solvable groups, abelian groups, rings, unique factorization domains, fields.
Prerequisites: MATH 5340 or MATH 7340
Term Offered: Fall

MATH 8310 Algebra II
[3 credit hours (3, 0, 0)]
Field extensions, Galois theory, modules, Noetherian and Artinian rings, tensor products, primitive rings, semisimple rings, and modules, the Wedderburn-Artin theorem.
Prerequisites: MATH 6300 or MATH 8300
Term Offered: Spring

MATH 8320 Ring Theory I
[3 credit hours (3, 0, 0)]
Radical theory, rings of quotients, Goldie's Theorem, chain conditions, dimensions of rings, module theory, topics in commutative rings.
Prerequisites: MATH 6310 or MATH 8310

MATH 8330 Ring Theory II
[3 credit hours (3, 0, 0)]
Advanced topics in ring theory. Possible topics include group rings, enveloping algebras, almost split sequences, PI-rings, division rings, self-injective rings, and ordered rings.
Prerequisites: MATH 6310 or MATH 8310

MATH 8340 Group Theory I
[3 credit hours (3, 0, 0)]
Fundamental topics in group theory. Possible topics include free groups, presentations, free products and amalgams, permutation groups, abelian groups, nilpotent and solvable groups, subnormality, extensions, the Schur-Zassenhaus theorem, the transfer homomorphism, linear methods, local analysis.
Prerequisites: MATH 6310 or MATH 8310

MATH 8350 Group Theory II
[3 credit hours (3, 0, 0)]
Advanced topics in group theory. Possible topics include cohomology of groups, locally finite groups, character theory, modular representation theory, representation theory of symmetric and classical groups, finite simple groups, geometric group theory.
Prerequisites: MATH 6310 or MATH 8310

MATH 8400 Topology I
[3 credit hours (3, 0, 0)]
Topological spaces, continuous functions, compactness, product spaces, Tychonov's theorem, quotient spaces, local compactness, homotopy theory, the fundamental group, covering spaces.
Prerequisites: MATH 7450 or MATH 4450 or MATH 5450
Term Offered: Fall

MATH 8410 Topology II
[3 credit hours (3, 0, 0)]
Homology theory, excision, homological algebra, the Brouwer fixed point theorem, cohomology, differential manifolds, orientation, tangent bundles, Sard's theorem, degree theory.
Prerequisites: MATH 6400 or MATH 8400
Term Offered: Spring

MATH 8440 Differential Geometry I
[3 credit hours (3, 0, 0)]
Introduction to differential geometry. Topics include differentiable manifolds, vector fields, tensor bundles, the Frobenius theorem, Stokes' theorem, Lie groups.
Prerequisites: MATH 6410 or MATH 8410
Term Offered: Fall

MATH 8450 Differential Geometry II
[3 credit hours (3, 0, 0)]
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 or MATH 8440

MATH 8500 Ordinary Differential Equations
[3 credit hours (3, 0, 0)]
Existence, uniqueness and dependence on initial conditions and parameter, nonlinear planar systems, linear systems, Floquet theory, second order equations, Sturm-Liouville theory.
Term Offered: Fall

MATH 8510 Partial Differential Equations
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Topics include the flow-box theorem, Poincare maps, attractors, w-limit sets, Lyapunov stability, invariant submanifolds, Hamiltonian systems and symplectic manifolds.
Prerequisites: MATH 6500 or MATH 8500

MATH 8530 Dynamical Systems II
[3 credit hours (3, 0, 0)]
Topics may include local bifurcations of vector fields, global stability, ergodic theorems, integrable systems, symbolic dynamics, chaos theory.
Prerequisites: MATH 6520 or MATH 8520

MATH 8540 Partial Differential Equations I
[3 credit hours (3, 0, 0)]
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 or MATH 8510
Term Offered: Fall

MATH 8550 Partial Differential Equations II
[3 credit hours (3, 0, 0)]
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 or MATH 8540
Term Offered: Spring
MATH 8600 Statistical Consulting
[1-5 credit hours (1-5, 0, 0)]
Real data applications of various statistical methods, project design and analysis including statistical consulting experience. May be repeated for credit.
Term Offered: Spring, Fall

MATH 8610 Statistical Consulting II
[2 credit hours (2, 0, 0)]
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 (3, 0, 0)]
Important methods and modeling techniques using generalized linear models and emphasizing loglinear and logit modeling.
Prerequisites: MATH 5680 or MATH 7680
Term Offered: Spring, Fall

MATH 8630 Nonparametric Statistics
[3 credit hours (3, 0, 0)]
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 or MATH 7680
Term Offered: Spring, Fall

MATH 8640 Topics In Statistics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Estimation, hypothesis testing, prediction, sufficient statistics, theory of estimation and hypothesis testing, simultaneous inference, decision theoretic models.
Prerequisites: MATH 5680 or MATH 7680
Term Offered: Fall

MATH 8670 Measure Theoretic Probability
[3 credit hours (3, 0, 0)]
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 or MATH 7680
Term Offered: Fall

MATH 8680 Theory Of Statistics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 or MATH 6650 or MATH 8650
Term Offered: Spring

MATH 8720 Methods Of Mathematical Physics I
[3 credit hours (3, 0, 0)]
Analytic functions, residues, method of steepest descent, complex differential equations, regular singularities, integral representation, real and complex vector spaces, matrix groups, Hilbert spaces, coordinate transformations.
Term Offered: Fall

MATH 8730 Methods Of Mathematical Physics II
[3 credit hours (3, 0, 0)]
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 or MATH 8720

MATH 8800 Real Analysis I
[3 credit hours (3, 0, 0)]
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 or MATH 6650
Term Offered: Fall

MATH 8810 Real Analysis II
[3 credit hours (3, 0, 0)]
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 or MATH 8800
Term Offered: Spring

MATH 8820 Functional Analysis I
[3 credit hours (3, 0, 0)]
Topics include Topological vector spaces, Banach spaces, convexity, the Hahn-Banach theorem, weak and strong topologies, Lp spaces and duality.
Prerequisites: MATH 6810 or MATH 8810
Term Offered: Fall

MATH 8830 Functional Analysis II
[3 credit hours (3, 0, 0)]
Topics include the Mackey-Arens Theorem, Banach algebras, spectra in Banach algebras, commutative Banach algebras, unbounded operators, the spectral theorem, topics in functional analysis.
Prerequisites: MATH 6820 or MATH 8820
Term Offered: Spring
MATH 8840 Complex Analysis I
[3 credit hours (3, 0, 0)]
Elementary analytic functions, complex integration, the residue theorem, infinite sequences of analytic functions, Laurent expansions, entire functions.
Prerequisites: MATH 6800 or MATH 8800
Term Offered: Fall

MATH 8850 Complex Analysis II
[3 credit hours (3, 0, 0)]
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 or MATH 8840
Term Offered: Spring

MATH 8870 Measure Theoretic Probability II
[3 credit hours (3, 0, 0)]
Focus on stochastic processes. Conditional expectations, martingales, random walks, markov chains, ergodic theorem, brownian motion.
Prerequisites: MATH 5680 and MATH 6860 and MATH 8860
Corequisites: MATH 6800

MATH 8930 Colloquium
[1 credit hour (0, 0, 1)]
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 (0, 0, 0-4)]
Problems and techniques of teaching elementary college mathematics, supervised teaching, seminar in preparation methods.
Term Offered: Spring, Fall

MATH 8960 Dissertation
[3-6 credit hours (0, 0, 0-6)]

MATH 8980 Topics In Mathematical Sciences
[3 credit hours (0, 0, 3)]
Special topics in Mathematics or Statistics.
Term Offered: Spring, Summer, Fall

MATH 8990 Readings In Mathematics
[1-5 credit hours (0, 0, 0-5)]
Readings in areas of Mathematics of mutual interest to the student and the professor.
Term Offered: Spring, Summer, Fall
MECH, IND, MFG ENGINEERING (MIME)

MIME 5060 Manufacturing Engineering
[3 credit hours (3, 0, 0)]
Students integrate machine tools and fabrication processes to optimize the manufacture of a product. Emphasis is on engineering design integrated with economic principles and fabricating methods.
Term Offered: Summer, Fall

MIME 5070 Computer-Aided Manufacturing
[3 credit hours (0, 2, 2)]
The study of machining processes using numerical control machine tools and controllers. Development of programs to machine parts on mills and lathes. Conversion of CAD models to programs through software interfaces.
Term Offered: Fall

MIME 5080 Operations Research I
[3 credit hours (3, 0, 0)]
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

MIME 5100 Manufacturing Systems Simulation
[3 credit hours (3, 0, 0)]
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

MIME 5230 Dynamics Of Human Movement
[3 credit hours (0, 0, 3)]
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: Fall

MIME 5280 Cad - Finite Element Methods
[3 credit hours (0, 0, 3)]
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 (3, 0, 0)]
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: Fall

MIME 5310 Mechanics Of Composite Materials
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Fatigue design methods; fatigue 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.
Term Offered: Spring

MIME 5410 Alternative Energy
[3 credit hours (3, 0, 0)]
This course focuses on the technical aspects of sustainable energy technologies, such as wind, solar, biomass, ocean, eaves/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

MIME 5510 Turbomachinery
[3 credit hours (3, 0, 0)]
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: Fall

MIME 5520 Heating, Ventilating & Air Conditioning
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Term Offered: Spring

MIME 5540 Jet Propulsion
[3 credit hours (3, 0, 0)]
Aerothermodynamic analysis of jet propulsion systems and components: diffuser, compressor, combustor, turbine and nozzle. Investigation of characteristics of ramjets, turbojets, turbofans and turboprops. Design theory and principles, performance analysis, and computational methods
Term Offered: Fall
MIME 5550 Aerodynamics
[3 credit hours (3, 0, 0)]
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

MIME 5560 Gas Dynamics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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, Fall

MIME 5820 Sustainability Analysis and Design
[3 credit hours (0, 0, 3)]
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.

MIME 5920 Special Projects
[1-6 credit hours (0, 0, 0)]
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, Fall

MIME 5980 Special Topics
[1-6 credit hours (1-6, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring

MIME 6200 Advanced Dynamics
[3 credit hours (3, 0, 0)]
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 6210 Advanced Mechanical Vibrations
[3 credit hours (3, 0, 0)]
Advanced concepts in normal mode theory for discrete systems and vibration of continuous systems such as bars, beams and plates.
Term Offered: Spring

MIME 6300 Continuum Mechanics
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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 (3, 0, 0)]
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 (0, 0, 3)]
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 (3, 0, 0)]
Term Offered: Fall

MIME 6450 Experimental Fluid Mechanics  
[3 credit hours (0, 2, 2)]
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 (3, 0, 0)]
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 Heat Transfer and Fluid Mechanics.
Term Offered: Fall

MIME 6540 Computational Fluid Dynamics II  
[3 credit hours (3, 0, 0)]
Prerequisites: MIME 6440
Term Offered: Spring

MIME 6570 Advanced Fluid Mechanics  
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MIME 6580 Advanced Heat Transfer  
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MIME 6590 Advanced Gas Dynamics  
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MIME 6720 Design Of Experiments  
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0)]
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 6910 Engineering Analysis of Smart Material Systems  
[3 credit hours (3, 0, 0)]
In this course the students will study the fundamental concepts behind different types of active materials. The course emphasizes current research topics and engineering applications of active materials.

MIME 6920 Special Projects  
[1-6 credit hours (0, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0)]
Masters thesis research.
Term Offered: Spring, Summer, Fall
MIME 6980 Special Topics
[1-6 credit hours (1-6, 0, 0)]
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 (0, 0, 0)]
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 7550 Aerodynamics
[3 credit hours (3, 0, 0)]
MIME 7690 Reliability
[3 credit hours (3, 0, 0)]
MIME 8000 Advanced Engineering Mathematics I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring
MIME 8120 Advanced Measurement Systems
[3 credit hours (2, 2, 0)]
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 (3, 0, 0)]
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 8210 Advanced Mechanical Vibrations
[3 credit hours (3, 0, 0)]
Advanced concepts in normal mode theory for discrete systems and vibration of continuous systems such as bars, beams and plates.
Term Offered: Spring
MIME 8300 Continuum Mechanics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Term Offered: Fall
MIME 8450 Experimental Fluid Mechanics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 Heat Transfer and Fluid Mechanics.
Term Offered: Fall
MIME 8540 Computational Fluid Dynamics II
[3 credit hours (3, 0, 0)]
Prerequisites: MIME 8440
Term Offered: Spring

MIME 8570 Advanced Fluid Mechanics
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MIME 8580 Advanced Heat Transfer
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MIME 8590 Advanced Gas Dynamics
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

MIME 8720 Design Of Experiments
[3 credit hours (0, 0, 3)]
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 8810 Assembly And Joining Processes
[3 credit hours (3, 0, 0)]
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 8910 Engineering Analysis of Smart Material Systems
[3 credit hours (3, 0, 0)]
In this course the students will study the fundamental concepts behind different types of active materials. The course emphasizes current research topics and engineering applications of active materials.

MIME 8920 Special Projects
[1-6 credit hours (0, 0, 0)]
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 (0, 0, 0)]
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
[1-16 credit hours (0, 0, 0)]
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 8980 Special Topics
[1-6 credit hours (1-6, 0, 0)]
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 (0, 0, 0)]
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 PHYSICS (MPHY)

MPHY 6010 Survey of Diagnostic Medical Imaging I
[3 credit hours (3, 0, 0)]
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 basics of Nuclear Medicine will be covered. The course builds upon basic reviews 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 (0, 0, 3)]
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 (0-5, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0-4)]
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 (2, 0, 0)]
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: Fall

MPHY 6120 Radiation Dosimetry I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 3, 0)]
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 6180 Physics of Radiation Therapy
[3 credit hours (3, 0, 0)]
Basic radiation physics and physical aspects of treatment planning, using photon and electron beams as well as brachytherapy sources will be taught.
Term Offered: Spring, Fall

MPHY 6190 Brachytherapy
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 3)]
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 Radiation Therapy
[2 credit hours (0, 0, 0)]
Computer fundamentals and problem solving through programming. Typical problems include PDD, TAR, TMR, MU calculations, scatter summation, TMR for arc and dose distributions.
MPHY 6280 Electronics for Med Physicists
[2 credit hours (0, 0, 0)]
Basics of electronics circuit design to perform specific tasks as it relates to medical physics applications.

MPHY 6300 Radiation Detection/Measurement
[3 credit hours (3, 3, 0)]
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 (4, 0, 0)]
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 Rad
[2 credit hours (2, 2, 0)]
Basic practical considerations in measurements of photon and electron beam parameters of the linear accelerator.

Term Offered: Summer

MPHY 6400 Intro to LINAC in Radiation Th
[3 credit hours (0, 0, 0)]
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 (1, 0, 0)]
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 Measurement
[3 credit hours (0, 0, 0)]
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 Oncl Physcs I
[4 credit hours (0, 0, 0)]
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 Oncl Physcs II
[4 credit hours (0, 0, 0)]
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 tune 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 Oncl Physcs III
[5 credit hours (0, 0, 0)]
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 (0, 0-12, 0)]
Students will participate in selected ongoing research programs of members of the department faculty. May be repeated for credit.

Term Offered: Winter

MPHY 6840 Independent Study: Med Physics
[0-12 credit hours (0-12, 0, 0)]
Combination of reading, lecture and discussion within a defined area of medical physics. Defined topics are: radiology, radiobiology, dosimetry, internal dosimetry, 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 (0-12, 0, 0)]
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 (0-12, 0, 0)]
Combination of reading, lecture, and discussion within a defined area of radiation therapy. Defined topics are: 3-D conformal, 3D 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 6970 Scholarly Project
[3 credit hours (0, 0, 0)]
Develop an in-depth scholarly project in radiation therapy to fulfill the requirements for the MSBS degree. May be repeated for credit.
MPHY 8010 Survey of Diagnostic Medical Imaging I
[3 credit hours (0, 0, 0)]
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 (0, 0, 3)]
This course builds on the material taught in MPHY 6010/8010, and discusses advanced concepts in medical imaging including functional MRI, SPECT, and PET imaging. Details of radioactivity & nuclear transformation, radionuclide production & radiopharmaceuticals, 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 (0-5, 0, 0)]
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 (3, 0, 0)]
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 (2, 0, 0)]
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: Fall

MPHY 8120 Radiation Dosimetry I
[3 credit hours (3, 0, 0)]
Series of lectures covering basic concepts of 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 (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Basic radiation physics and physical aspects of treatment planning, using photon and electron beams as well as brachytherapy sources will be taught.
Term Offered: Spring, Fall

MPHY 8190 Brachytherapy
[3 credit hours (0, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0)]
Basics of electronics circuit design to perform specific tasks as it relates to medical physics applications.

MPHY 8300 Radiation Detection/Measuremen
[3 credit hours (3, 0, 0)]
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, PHY56180, is taught through the University of Toledo.
Term Offered: Spring
MPHY 8310 Anatomy & Physiology  
[4 credit hours (4, 0, 0)]  
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 (0, 0, 0)]  
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 (0, 0, 0)]  
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 (0, 0, 0)]  
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 (0, 0, 0)]  
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 Tng Radi Oncol Physics I  
[4 credit hours (0, 0, 0)]  
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 Tng Radi Oncol Physcs II  
[4 credit hours (0, 0, 0)]  
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 Tng Radi Oncol Physc III  
[5 credit hours (0, 0, 0)]  
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 (0, 0, 0)]  
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 (0, 0, 0)]  
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 (0, 0, 0)]  
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 (0, 0, 0)]  
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 (0, 0, 0-15)]  
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 (1, 0, 0)]
Consideration of the scientific, ethical and legal obligations of the graduate student researcher.
Term Offered: Spring, Summer

MBC 5300 Molecular Basis of Cancer Chemotherapy
[1 credit hour (1, 0, 0)]
Discussion of molecular properties and mechanisms of action that form the basis of current and emergent cancer chemotherapies.
Corequisites: PHPR 5300
Term Offered: Fall

MBC 5380 Medicinal And Poisonous Plants
[3 credit hours (3, 0, 0)]
Lecture/field course examining medicinal and harmful properties of herbals and plants using pharmacognosy, clinical trials and local plant examples.
Term Offered: Summer

MBC 5620 Biochemical Techniques
[2 credit hours (2, 0, 0)]
A detailed study of biochemical laboratory techniques necessary for the development of novel therapeutics, including bioassays and data analysis.
Term Offered: Fall

MBC 5900 Medicinal Chemistry Seminar
[1 credit hour (1, 0, 0)]
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 (2, 0, 0)]
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 (4, 0, 0)]
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 Biomedical Chemistry
[4 credit hours (4, 0, 0)]
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
Term Offered: Spring

MBC 6300 Biomedical Chemistry Laboratory I
[1 credit hour (0, 1, 0)]
Experimental research problems in biomedicinal chemistry.
Prerequisites: (MBC 6190 and MBC 6550)
Term Offered: Spring, Fall

MBC 6310 Biomedical Chemistry Laboratory II
[3 credit hours (0, 3, 0)]
Additional experimental research problems in biomedicinal chemistry (see MBC 6300/8300).
Prerequisites: (MBC 6190 and MBC 6550)
Term Offered: Spring, Summer, Fall

MBC 6320 NEUROLOGICAL AND PSYCHIATRIC DRUGS
[1 credit hour (1, 0, 0)]
A course analyzing the chemical and mechanistic basis for the modulation of neurologically based attributes and disorders.
Corequisites: PHCL 6320, PHPR 6140
Term Offered: Spring

MBC 6420 Protein Chemistry
[4 credit hours (4, 0, 0)]
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: MBC 6550

MBC 6430 Nucleic Acid Chemistry
[4 credit hours (4, 0, 0)]
The chemical basis for storage and transmission of genetic information.
Prerequisites: MBC 6550

MBC 6440 Enzymology
[4 credit hours (4, 0, 0)]
The principles of chemical catalysis applied to molecular enzymology.

MBC 6450 Advanced Synthetic and Medicinal Chemistry
[2 credit hours (0, 0, 2)]
Readings in and critical analysis of recent literature in synthetic and medicinal chemistry research.
Term Offered: Spring, Fall

MBC 6550 Biochemistry
[4 credit hours (4, 0, 0)]
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 (0, 0-45, 0)]
Development and pursuit of research leading to an M.S. thesis in medicinal chemistry.
Term Offered: Spring, Summer, Fall

MBC 6980 Special Topics In Biomedical Chemistry
[1-5 credit hours (0-15, 0, 0)]
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 (1, 0, 0)]
Consideration of the scientific, ethical and legal obligations of the
graduate student researcher.
Term Offered: Spring, Summer

MBC 7620 Biochemical Techniques
[2 credit hours (2, 0, 0)]
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 (1, 0, 0)]
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 (2, 0, 0)]
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 (4, 0, 0)]
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 Biomedical Chemical Physiology
[4 credit hours (4, 0, 0)]
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
Term Offered: Spring

MBC 8300 Biomedical Chemistry Laboratory I
[1 credit hour (0, 1, 0)]
Experimental research problems in biomedical chemistry.
Prerequisites: (MBC 6190 and MBC 8550)
Term Offered: Spring, Fall

MBC 8310 Biomedical Chemistry Laboratory II
[3 credit hours (0, 3, 0)]
Additional experimental research problems in biomedical chemistry
(see MBC 6300/8300).
Prerequisites: (MBC 6190 and MBC 8550)
Term Offered: Spring, Summer, Fall

MBC 8420 Protein Chemistry
[4 credit hours (4, 0, 0)]
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.

MBC 8430 Nucleic Acid Chemistry
[4 credit hours (4, 0, 0)]
The chemical basis for storage and transmission of genetic information.

MBC 8440 Enzymology
[4 credit hours (4, 0, 0)]
The principles of chemical catalysis applied to molecular enzymology.

MBC 8450 Advanced Synthetic and Medicinal Chemistry
[2 credit hours (0, 0, 2)]
Readings in and critical analysis of recent literature in synthetic and
medicinal chemistry research.
Term Offered: Spring, Fall

MBC 8550 Biochemistry
[4 credit hours (4, 0, 0)]
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 (0-45, 0, 0)]
Development and pursuit of research leading to a Ph.D. dissertation in
medicinal chemistry.
Term Offered: Spring, Summer, Fall

MBC 8980 Special Topics In Biomedical Chemistry
[1-5 credit hours (0-15, 0, 0)]
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 6050 Advanced Biostatistics
[1-3 credit hours (1-3, 1-3, 0)]
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 (2, 0, 0)]
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 (0-4, 0, 0)]
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 6730 Research in Medicine
[0-4 credit hours (0-4, 0-4, 0)]
Student will participate in selected ongoing research programs of members of the staff. May be repeated for credit.

MEDI 6890 Independent Study in Medicine
[0-12 credit hours (0, 0, 0)]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit.

Term Offered: Fall

MEDI 8890 Independent Study in Medicine
[0-12 credit hours (0, 0, 0)]
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 (0, 0, 5)]

MICB 6200 Microbiology Human Infections
[3 credit hours (0, 0, 3)]
A series of lectures describing the classification, replication strategies and structural composition of the major families of animal viruses that infect humans.

MICB 6210 Advanced Virology
[3 credit hours (0, 0, 3)]
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 Togaviridae 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 (0, 0, 0)]
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 (0, 0, 0)]
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 (3, 0, 3)]
A series of lectures describing the classification, replication strategies and structural composition of the major families of animal viruses that infect humans.

MICB 8210 Advanced Virology
[3 credit hours (0, 0, 3)]
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 Togaviridae 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 (0, 0, 0)]
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 (0, 0-15, 0)]
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 (0, 0, 1)]
Students will perform a wide variety of band literature.
Term Offered: Spring, Fall

MUS 5020 Jazz Ensemble
[1 credit hour (0, 0, 1)]
Students rehearse and perform a diverse repertoire for large jazz ensemble. Open to qualified students by audition in the first week of each semester and/or permission of instructor.
Term Offered: Spring, Fall

MUS 5030 Brass Choir
[1 credit hour (0, 0, 1)]
Open to a limited number of qualified students.
Term Offered: Spring

MUS 5050 Chamber Music Ensembles
[1 credit hour (0, 0, 1)]
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 5090 University Orchestra
[1 credit hour (0, 0, 1)]
Open to any qualified student.
Term Offered: Spring, Fall

MUS 5130 University Chorus
[1 credit hour (0, 0, 2)]
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 (0, 0, 1)]
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 (0, 0, 3)]
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 (0, 0, 2)]
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 (0, 0, 2)]
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 (0, 0, 2)]
Open to any qualified student.
Term Offered: Spring, Fall

MUS 5410 Music History And Literature: World Music
[3 credit hours (3, 0, 0)]
Explores the function and styles of music in various cultures.
Term Offered: Spring

MUS 5440 Music History And Literature: Special Topics
[3 credit hours (3, 0, 0)]
The area of study will be announced at the time the course is offered.
Term Offered: Spring

MUS 5490 Music History And Literature: The Twentieth Century
[3 credit hours (3, 0, 0)]
An intensive study of the literature, composers, theorists, trends and musical styles during the 20th century.

MUS 5510 Choral Conducting
[2 credit hours (0, 0, 2)]
Conducting techniques and rehearsal routine, especially concerned with choral groups. Opportunities to direct student choral groups.
Prerequisites: MUS 3500
Term Offered: Spring, Summer, Fall

MUS 5520 Instrumental Conducting
[2 credit hours (0, 0, 2)]
Conducting techniques and rehearsal routine especially concerned with instrumental ensembles. Opportunities to direct student instrumental groups.
Prerequisites: MUS 3500
Term Offered: Spring

MUS 5590 Piano Pedagogy
[3 credit hours (0, 0, 3)]
Exploration of techniques and materials for comprehensive, private and group instruction.
Term Offered: Fall

MUS 5610 Analytical Techniques
[3 credit hours (3, 0, 0)]
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
Term Offered: Fall

MUS 5630 Counterpoint: Comparison Of Styles
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring
MUS 5800 Applied Music
[1-2 credit hours (0, 0, 0-1)]
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 (3, 0, 0)]
The study of sources and bibliographical materials in music.
Term Offered: Fall

MUS 6000 Master’s Recital
[0 credit hours (0, 0, 0)]
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 (3, 0, 0)]
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 (2, 0, 0)]
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 (2, 0, 0)]
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 6650 Seminar in Music Arranging
[3 credit hours (0, 0, 3)]
Examination and analysis of scores of varied composers and styles; creative assignments in orchestration exploring traditional and contemporary textures and timbres.
Prerequisites: MUS 3500

MUS 6690 Seminar in Music Composition
[2 credit hours (0, 0, 2)]
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 (2, 0, 0)]
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
MUSIC EDUCATION (MED)

MED 5340 Curriculum Development In Music Education  
[3 credit hours (3, 0, 0)]  
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 (0, 0, 3)]  
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 (3, 0, 0)]  
Study of theories of musical behavior and pattern perception.  
Term Offered: Spring, Fall

MED 5990 Independent Study In Music Education  
[1-3 credit hours (0, 0, 0-3)]  
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 (0, 0, 0-3)]  
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 (0, 0, 0-3)]  
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 (0, 0, 0-3)]  
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

MED 6980 Music Education: Special Topics  
[1-3 credit hours (0-3, 0, 0)]  
The area of study will be announced at the time the course is offered.  
Term Offered: Summer
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>NNDP 5810</td>
<td>Neuroscience</td>
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<tr>
<td>NNDP 6010</td>
<td>Neurosciences Neurolog Disease</td>
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<td>NNDP 6500</td>
<td>Seminar in Neuroscience</td>
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<td>NNDP 6540</td>
<td>Jnl Paper Review Neuroscience</td>
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<td>NNDP 6560</td>
<td>Readings in Neuroscience</td>
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<tr>
<td>NNDP 6720</td>
<td>Current Topics in Neuroscience</td>
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<td>NNDP 6730</td>
<td>Research in NNDP</td>
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<td>NNDP 6890</td>
<td>Indep Study in Neuroscience</td>
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<tr>
<td>NNDP 6990</td>
<td>Thesis Research Neurosci Neuro</td>
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<tr>
<td>NNDP 7810</td>
<td>Neuroscience</td>
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<td>Spring</td>
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</table>
NEUROSCIENCE (NERS)

NERS 5810 Neuroscience
[6 credit hours (6, 0, 0)]
The content of the medical neuroscience course includes not only the basic science concepts introduced in more traditional neuroanatomy courses, it also incorporates neurohistology, neuroembryology, neurophysiology, neuropathology, and neuroradiology. The usefulness of these concepts are reinforced by numerous clinically-based lectures which emphasize the importance of integrating basic neuroanatomical knowledge with the clinical symptoms presented by a neurological deficit. Other clinically-based lectures present current medical concepts concerning neuroimmunology, neurodegenerative diseases, pain, sleep, epilepsy, substance abuse, and memory and learning.

Term Offered: Spring
NURSING (NURS)

NURS 5020 Adult Health Nursing III
[4 credit hours (0, 0, 0)]
Using Orem's SCDT, students assess and apply the nursing process in order to promote the health of individuals and families across the life span. Includes 30 clinical hours.
Term Offered: Fall

NURS 5040 Hlth Assess and Nrs Prmng Hlth
[6 credit hours (6, 6, 6)]
Using Orem's SCDT, students assess individuals and families and apply the nursing process in order to promote the health of individuals and families. Includes 30 clinical hours.
Term Offered: Spring

NURS 5050 Integrative Hlth Science I
[3 credit hours (3, 0, 0)]
Examines foundational chemical, physical, cellular biological, and microbiological principles of human physiology. Focuses on advanced physiologic and pathophysiologic mechanisms underlying human responses to genetic, defense, and nervous system disease.
Term Offered: Fall

NURS 5060 Professional Socialization I
[3 credit hours (3, 0, 0)]
Focuses on the development of the professional nursing role. Students explore the effects of historical, legal, and ethical influences on professional nursing. Cultural diversity also is examined.
Term Offered: Fall

NURS 5070 Therapeutic Comm Skills Nurses
[3 credit hours (3, 3, 0)]
Focuses on therapeutic communication skills at the intrapersonal and interpersonal levels. Explore nursing agency from a holistic perspective. Includes 30 clinical hours.
Term Offered: Fall

NURS 5140 Design Nurs Sys Promote Slf Cr
[0-7 credit hours (0-7, 0-7, 0)]
Apply Orem's SCDT in the design and implementation of nursing systems that assist individuals and families to achieve and maintain optimal health. Includes 90 clinical hours.
Term Offered: Spring

NURS 5160 Professional Socialization II
[3 credit hours (3, 0, 0)]
Integrate nursing theory and models into professional nursing practice. Focuses on ethical, political, and economic issues that impact nursing practice. Differentiation of advanced practice and entry level roles are explored.
Term Offered: Spring

NURS 5190 Adv Interpersonal Intervention
[2-3 credit hours (0, 0, 0)]
Integrates interpersonal strategies and complementary modalities through peer counseling and supervision. Analyzes personal abilities and limitations in developing therapeutic relationships with individuals and groups. Includes 60 hours clinical.
Term Offered: Spring, Fall

NURS 5220 Field Experience Seminar
[1-3 credit hours (0, 0, 0)]
Program capstone experience that integrates nursing theory, research, and practice to fulfill the requirements of the MSN degree.
Term Offered: Spring, Summer, Fall

NURS 5240 Design Nurs Sys Com Hlth Sts
[6 credit hours (6, 6, 0)]
Using Orem's SCDT, students design and implement nursing systems that assist individuals and families with complex problems to achieve and maintain optimal health. Includes 120 clinical hours.
Term Offered: Summer

NURS 5250 Health Science II
[3 credit hours (3, 0, 0)]
Focuses on advanced physiologic and pathophysiologic mechanisms underlying disease across the life span. Examines cardiovascular, respiratory, endocrine, muscular skeletal, nervous, genitourinary, hepatobiliary, renal, integumentary and gastrointestinal systems.
Prerequisites: (NURS 504 or NURS 5040) and (NURS 505 or NURS 5050) and (NURS 506 or NURS 5060) and (NURS 507 or NURS 5070)
Term Offered: Spring

NURS 5330 Health Assessments
[3 credit hours (1, 2, 0)]
Focuses on acquisition of graduate level skills in collection and documentation of assessment data across the life-span. Differentiates normal from abnormal findings. Supervised laboratory practice is required.
Term Offered: Summer

NURS 5400 Theoretical and Ethical Found
[3 credit hours (3, 0, 3)]
Explores roots of nursing as a science and art. Examines personal and professional values in the context of ethical decision-making. Emphasis is on analysis and evaluation of selected nursing and ethical theories. Course Enrollment is Limited.
Term Offered: Spring, Fall

NURS 5440 Population Focused Care
[6 credit hours (6, 0, 0)]
Students apply epidemiological principles and Orem's SCDT to improve the health status of aggregates, vulnerable populations and communities. Includes 90 clinical hours.
Term Offered: Fall

NURS 5500 Family and Cultural Diversity
[3 credit hours (3, 0, 3)]
Term Offered: Spring, Fall

NURS 5510 Adv Clinical Seminar:Nursing
[3, 4 credit hours (0, 0, 0)]
Application of nursing theory and research with clients in wellness promotion or complex care states. Emphasis is on the assessment and analysis of human responses and outcomes of care.
Term Offered: Fall

NURS 5530 Public Policy and Health Care
[2-3 credit hours (2-3, 0, 2-3)]
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
NURS 5540 Adv Practicum Nurs Sys Design
[12 credit hours (12, 0, 0)]
Students demonstrate integration of nursing knowledge and skill in designing and implementing nursing systems in a capstone clinical experience. Includes 300 clinical hours.
Term Offered: Spring

NURS 5610 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adults
[7 credit hours (3, 0, 4)]
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
Corequisites: NURS 5680, NURS 5690

NURS 5620 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical II Child, Adolescent, Family
[7 credit hours (3, 0, 4)]
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 and NURS 5690

NURS 5630 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adults
[9 credit hours (3, 0, 6)]
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 and NURS 5620

NURS 5670 Pharmacology
[3 credit hours (3, 0, 0)]
Focuses on fundamental pharmacological principles. Prepares for critical thinking in application of pharmacotherapy principles to nursing. Emphasizes physiological responses to drugs, expected outcomes, and potential drug interactions.
Prerequisites: (NURS 504 or NURS 5040) and (NURS 505 or NURS 5050) and (NURS 506 or NURS 5060) and (NURS 507 or NURS 5070)
Term Offered: Spring, Summer

NURS 5680 Advanced Physiology and Pathophysiology
[3 credit hours (3, 0, 0)]
Focuses on advanced physiologic and pathophysiologic mechanisms underlying human responses to disease illness across the life span. Students will build on existing knowledge of human anatomy and physiology. Course Enrollment is Limited.
Term Offered: Spring, Summer, Fall

NURS 5690 Adv Pharmacotherapeutics
[3 credit hours (3, 0, 0)]
Focuses on advanced pharmacologic principles in decision-making for pharmacotherapy. Emphasizes responses to drugs, expected outcomes, and potential drug interactions. Discusses professional responsibilities of prescriptive privileges.
Term Offered: Spring, Fall

NURS 5740 Advanced Health Assessments
[4 credit hours (0, 0, 0)]
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. Course Enrollment is Limited. Includes 60 hours laboratory.
Term Offered: Spring, Fall

NURS 5810 PNP I: Care of Children - Well
[6 credit hours (0, 0, 0)]
Focuses on the health care needs of children and adolescents and principles of health promotion and wellness. Students will have an opportunity to begin development of skills in primary and specialty care settings. Includes 180 hours clinical.
Term Offered: Spring, Summer

NURS 5820 PNP Clin II: Acute/Chronic
[6 credit hours (0, 0, 0)]
Focuses on the care of children and adolescents with an emphasis on the management of common acute and stable chronic illnesses. Includes 180 hours clinical.
Term Offered: Fall

NURS 5830 PNP Clinical III: Complex
[6 credit hours (3, 3, 0)]
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 582 or NURS 5820)
Term Offered: Spring

NURS 5910 Advanced Nursing Research
[3 credit hours (3, 0, 3)]
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.
Term Offered: Spring, Summer, Fall

NURS 5980 Comprehensive Exam in Nursing
[3 credit hours (0, 0, 0)]
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 6070 Adv Comm Skills Grp Dynamics
[3 credit hours (3, 0, 0)]
Focuses on advanced therapeutic communication skills in the nurse-client relationship and analysis of Self-care agency. Complementary modalities are explored. Includes 30 clinical hours.
Term Offered: Fall

NURS 6140 Adv Pract Nurs: Role and Issue
[2 credit hours (2, 0, 0)]
Focuses on the issues and role of the advanced practice nurse, including historical and current perspectives of the advanced role. Examines health care system issues pertaining to advanced practice.
Term Offered: Spring, Fall
NURS 6210 FNP Clin I: Adolescent and Adult
[6-7 credit hours (0, 0, 0)]
Focuses on primary care of common and chronic illness of adolescents and adults. Clinical experiences will continue to incorporate women and children, adults, and target populations. Includes 180 clinical hours.
*Term Offered:* Spring, Summer

NURS 6220 FNP Clin II: Women and Children
[6,7 credit hours (0, 0, 0)]
Focuses on the primary care of children and women's health and includes normal prenatal care. Emphasis is on health promotion and common acute illness. Includes 180 clinical hours.
*Term Offered:* Fall

NURS 6230 FNP Clin III: Adults/Older Adult
[6-8 credit hours (0, 0, 0)]
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.
*Term Offered:* Spring

NURS 6310 Adult Gerontology Nurse Practitioner Theory and Clinical I
Adolescents and Young Adults
[7 credit hours (3, 0, 4)]
Holistic care of culturally diverse adolescents and young adults in multiple care settings. Assessment and management of common acute and chronic health problems with emphasis on health promotion and risk reduction.
*Prerequisites:* NURS 5740 and NURS 5680

NURS 6320 Adult Gerontology Nurse Practitioner Theory and Clinical II
Adults
[7 credit hours (3, 0, 4)]
Holistic care of culturally diverse adults in multiple care settings with emphasis on gender specific health care needs and principles of health promotion and wellness.
*Prerequisites:* NURS 6310 and NURS 5690

NURS 6330 Adult Gerontology Nurse Practitioner Theory and Clinical III
Older Adults
[8 credit hours (2, 0, 6)]
Holistic care of culturally diverse older adults in multiple care settings with emphasis on care management of acute and chronic conditions, emergent issues and end of life concerns.
*Prerequisites:* NURS 6320

NURS 6710 Develop Instruc Progrm Nursing
[3 credit hours (3, 0, 0)]
Focuses on skills to develop curricular components for nursing instructional programs. Examines the relationships among mission, philosophy, goals, and outcomes for various learning environments.
*Term Offered:* Summer

NURS 6720 Tchg, Lrng and Evaluation Nurs
[4 credit hours (4, 0, 4)]
Focuses on teaching-learning theories, processes, strategies, and styles. Examines evaluation principles and strategies in the classroom and clinical setting.
*Term Offered:* Spring

NURS 6730 Practicum/Seminar in Teaching
[3,4 credit hours (0, 0, 0)]
Applies knowledge of learning and evaluation theories in the development and implementation of a program of instruction. Within a seminar format, emphasizes significant issues in healthcare education.
*Term Offered:* Fall

NURS 6890 Independent Study in Nursing
[0-4 credit hours (0, 0, 0)]
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 6990 Thesis Research
[1-3 credit hours (0, 1-3, 0)]
Research in nursing to fulfill the research requirement of the Nursing Master's Program. The (required) 2 credit hours may be divided and repeated across semesters. Only 2 credit hours are applicable for the degree. May be repeated for credit.
*Term Offered:* Spring, Summer, Fall

NURS 7000 BSN-DNP Orientation
[1 credit hour (0, 0, 1)]
Focuses on pertinent information needed by incoming students in the BSN-DNP Program. Emphasis on requirements of The University of Toledo and the College of Nursing to matriculate in the Program
*Term Offered:* Fall

NURS 7010 Scientific Basis Nsg Practice
[3 credit hours (0, 0, 3)]

NURS 7011 Theoretical Basis for Evidence-Based Practice
[3 credit hours (0, 0, 3)]

NURS 7020 Org Systems Leadership in Hlth
[3 credit hours (3, 3, 0)]
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:* Fall

NURS 7030 Qual Mgmt/Perf Improve Hlth Or
[3 credit hours (3, 3, 0)]
Examines principles/practice of quality management/clinical performance in care delivery and outcomes. Focuses on role and accountability of the advanced practice nurse/collaborative team for maintaining safety and improving quality of care.
*Term Offered:* Spring, Fall

NURS 7040 Applied Nursing Research
[3 credit hours (0, 0, 0)]
This course builds on knowledge of research and clinical practice with emphasis on evidence-based practice. Students learn to critically examine and apply nursing research within the practice setting.
*Term Offered:* Spring, Fall
NURS 7050 Inf Tech Nsg & Hlth Care Syst
[3 credit hours (0, 0, 0)]
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 (3, 0, 0)]
This course uses epidemiologic models to analyze and construct interventions for health care delivery systems. The focus is on safe, quality, culturally-appropriate advanced nursing practice activities to meet emerging world needs.
Prerequisites: INDI 6000 or INDI 8000
Term Offered: Spring, Fall

NURS 7070 Mktg/Entrep Act Cmplx Hlth Cr
[3 credit hours (3, 0, 0)]
This course examines marketing and entrepreneurial strategies for advanced nursing practice in complex health care systems. The focus is on creating and evaluating marketing plans and entrepreneurial activities.
Term Offered: Spring

NURS 7080 Evidence Based Nursing Practice in Direct Care
[3 credit hours (0, 0, 0)]
This course examines diagnostic laboratory and imaging methods as foundational evidence for assessment and intervention in the care of patient populations. The focus is on examining the basis for diagnosis using laboratory and imaging procedures, assessing the quality and reliability/sensitivity of diagnostic test results, understanding the technology used in diagnostic testing, and utilizing cost-benefit data in ordering diagnostic testing.
Term Offered: Spring

NURS 7090 Project Seminar
[1-3 credit hours (0, 0, 0)]
This course provides a forum to articulate and explore advanced nursing practice roles and responsibilities. The focus will be on leading nursing practice in patient advocacy, teaching, collaboration, and the design and provision of care.
Term Offered: Summer, Fall

NURS 7100 Doctoral Project
[1-3 credit hours (0, 0, 0)]
This course is guided, independent project utilizing research to improve patient outcomes, health care delivery, or nursing practice.
Prerequisites: (NURS 7040 and NURS 7010 and NURS 7090) or (NURS 704 and NURS 701 and NURS 709)
Term Offered: Spring, Summer, Fall

NURS 7180 Evdnc Base Admin Comp Hlth Sys
[3 credit hours (0, 0, 0)]
This course examines evidence practices in administrative health care settings. The focus is on examining current status and creating and evaluating innovative administrative practices based on best practices. Competencies include model application for finance and clinical outcomes.
Term Offered: Fall

NURS 7210 Family Nurse Practitioner Clinical I: Primary Care of Adolescents and Adults
[7 credit hours (3, 0, 4)]
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 7740 and NURS 7400 and NURS 7410
Corequisites: NURS 7690
Term Offered: Summer, Fall

NURS 7220 Family Nurse Practitioner Clinical II: Primary Care of Women and Children
[7 credit hours (3, 0, 4)]
Focuses on primary care of children/women's health. Emphasis on health promotion and common acute illness, role development.
Prerequisites: NURS 7210
Term Offered: Spring, Fall

NURS 7230 Family Nurse Practitioner Clinical III: Primary Care of Adults and Older Adults
[8 credit hours (2, 0, 6)]
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
Term Offered: Spring, Fall

NURS 7310 Adult Gerontology Nurse Practitioner Theory and Clinical 1 Adolescents and Young Adults
[7 credit hours (3, 0, 4)]
Holistic care of culturally diverse adolescents and young adults in multiple care settings. Assessment and management of common acute and chronic health problems with emphasis on health promotion and risk reduction.
Prerequisites: NURS 7740 and NURS 7680

NURS 7320 Adult Gerontology Nurse Practitioner Theory and Clinical II Adults
[7 credit hours (3, 0, 4)]
Holistic care of culturally diverse adults in multiple care settings with emphasis on gender specific health care needs and principles of health promotion and wellness.
Prerequisites: NURS 7310 and NURS 7690

NURS 7400 Theoretical Foundations of Advanced Nursing Practice
[2 credit hours (0, 0, 2)]
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: Fall

NURS 7410 Ethical Foundations of Advanced Nursing Practice
[2 credit hours (0, 0, 2)]
Examines the inter-relationship between theory, research, practice in ethical decision-making. Focuses on critical analysis/evaluation of selected ethical theories, values, professional codes of ethics related to evidence-based practices.
Corequisites: NURS 7000
Term Offered: Spring
NURS 7500 Family and Cultural Diversity Theories
[3 credit hours (0, 0, 3)]
Explores family and cultural diversity theories and process. Examines assessment, analysis, and evaluation of family function. Analyzes cultural competence of advanced practice nursing.
Term Offered: Spring, Fall

NURS 7530 Public Policy and Health Care
[3 credit hours (0, 0, 3)]
This course explores the public policy process from agenda setting through program evaluation. The focus is on how health problems are brought to the attention of government and solutions are obtained. Some field work is required.
Term Offered: Spring, Summer

NURS 7610 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical I Adult
[7 credit hours (3, 0, 4)]
Focuses on preparing the student in the advanced practice role for assessment, diagnosis, and treatment planning of select acute and chronic psychiatric disorders and mental health care needs of individuals across the lifespan.
Prerequisites: NURS 7050 and NURS 7400 and NURS 7410 and NURS 7680 and NURS 7740
Corequisites: NURS 7690

NURS 7620 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical II Child Adolescent Family
[7 credit hours (3, 0, 4)]
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 and NURS 7690

NURS 7630 Psychiatric-Mental Health Nurse Practitioner Theory and Clinical III Older Adult
[9 credit hours (3, 0, 6)]
Focus on acute or chronic psychiatric or mental health issues faced by older adults and their families- dementia, delirium, and depression.
Prerequisites: NURS 7610 and NURS 7620

NURS 7680 Advanced Physiology and Pathophysiology
[3 credit hours (0, 0, 3)]
Focuses on advanced physiologic and pathophysiologic mechanisms underlying human responses to illness across the life-span. Students will build on existing knowledge of human anatomy and physiology.
Term Offered: Spring, Fall

NURS 7690 Advanced Pharmacotherapeutics
[3 credit hours (0, 0, 3)]
Focuses on acquisition of advanced skills in collection and documentation of assessment data across the life-span. Differentiates normal, abnormal physiologic/psychosocial findings. Analyzes abilities/limitations in developing therapeutic relationships. Supervised laboratory practice.
Prerequisites: NURS 7680
Term Offered: Spring

NURS 7740 Advanced Health Assessment
[5 credit hours (3, 2, 0)]
Focuses on acquisition of advanced skills in collection and documentation of assessment data across the life-span. Differentiates normal, abnormal physiologic/psychosocial findings. Analyzes abilities/limitations in developing therapeutic relationships. Supervised laboratory practice.
Prerequisites: NURS 7680
Term Offered: Spring

NURS 7810 Pediatric Nurse Practitioner Clinical I: Care of Children and Concepts of Wellness
[6 credit hours (2, 0, 4)]
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 and NURS 7410 and NURS 7740
Corequisites: NURS 7690
Term Offered: Summer

NURS 7820 Pediatric Nurse Practitioner Clinical II: Common Acute, and Stable Chronic Illnesses
[6 credit hours (2, 0, 4)]
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 individuals and groups.
Prerequisites: NURS 7810

NURS 7830 Pediatric Nurse Practitioner Clinical III: Complex Chronic Illnesses or Disabilities
[6 credit hours (2, 0, 4)]
Prerequisites: NURS 7820

NURS 7890 Independent Study
[1-4 credit hours (0, 0, 1-4)]
NURS 7890 is an academic course completed outside of the required classroom, clinical or college laboratory experiences that provide the learner with an opportunity to pursue an area of interest in depth. This course may not be used to substitute for required courses. The course is supervised by a faculty member and approved by the Program director. A contract must be completed by the student and approved by the faculty member and the program director prior to the semester in which the Independent Study is to be conducted. Faculty approval is required before the student can register for this course.
Term Offered: Spring, Summer, Fall

NURS 7910 Advanced Nursing Research
[3 credit hours (3, 0, 0)]
Students will identify a research problem and develop an appropriate conceptual framework. They will critically review published research in the area of interest and identify appropriate design, methods and statistical analysis. Major approaches of qualitative and quantitative methodologies will be explored.
Prerequisites: INDI 8000 and NURS 7400
Term Offered: Spring

NURS 7920 Outcomes Methods for Advanced Practice Nurses
[3 credit hours (0, 0, 3)]
Emphasis on statistical methods associated with outcome measurement, experimental and quasi-experimental designs, meta-analysis and meta-synthesis. Evaluates nursing evidence in support of evidence-based practice protocol, development and evaluation.
Prerequisites: INDI 8000 and NURS 7910
Corequisites: NURS 7040
Term Offered: Fall
NURS 7970 Final Practicum (Direct Care)  
[1-6 credit hours (0, 0, 0)]  
Individually precepted practicum that requires advanced nursing practice with individuals and groups. Includes seminar that facilitates synthesis and application of all prior learning for evidence-based practice.  
Prerequisites: NURS 7010 or NURS 7011 or NURS 701  
Term Offered: Spring, Summer, Fall

NURS 7980 Final Practicum (Indirect Care)  
[1-6 credit hours (0, 0, 1-6)]  
Individually precepted practicum that requires leadership and practice at the aggregate/systems/organizational level of health care. Includes required seminar that facilitates application, synthesis, and evaluation of prior learning in applied practice.  
Term Offered: Spring, Summer, Fall

NURS 8000 Intro to Biostatistical Method  
[3 credit hours (0, 0, 3)]
OCCT 7000 Foundations of Occupational Therapy
[3 credit hours (3, 0, 0)]
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 (5, 5, 0)]
Examines the biomechanical model of practice including its musculoskeletal and kinesiological foundations. Includes assessments and interventions for prevention, adaptation, and compensation. Includes Level I fieldwork experience (12 hours). Fall Prerequisite: Admission to OTD Program
Term Offered: Fall

OCCT 7020 OT Models of Practice II
[5 credit hours (5, 0, 0)]
Part I: Continues OCCT701. Part II: 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. Examines a model of practice based on functions of the nervous system. Spring 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 (4, 0, 0)]
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. Includes two Level I fieldwork experiences (24 hours and 9 hours). Spring 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 (0, 0, 0)]
Examines models of practice specific to pediatric population with neurological impairments. Intervention strategies focus on neurodevelopment, neurorehabilitation, sensory integration, motor learning, and motor control impairments. Includes two Level I fieldwork experiences (12 hours and 16 hours). Summer Prerequisite: Occupational Therapy Models of Practice II
Term Offered: Summer

OCCT 7110 Research in OT I
[4 credit hours (4, 0, 0)]
Examines quantitative and qualitative research methodologies. Includes critical analysis of occupational therapy research. Explores areas of possible research interest with guidance from potential major advisors. Fall Prerequisite: Admission to the OTD Program
Term Offered: Fall

OCCT 7210 OT Advocacy I
[2 credit hours (2, 0, 0)]
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. Fall Prerequisite: Admission to OTD Program
Term Offered: Summer

OCCT 7310 FW and Professional Dev I
[1 credit hour (0, 0, 0)]
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. Fall Prerequisite: Admission to the OTD Program
Term Offered: Fall

OCCT 7320 FW and Professional Dev II
[1 credit hour (0, 0, 0)]
Emphasizes interviewing clients for an occupational profile. Encourages discussion of Level I fieldwork experiences. Introduces the course sequence of the Capstone Experience. Spring Prerequisite: Fieldwork and Professional Development Seminar I
Term Offered: Spring

OCCT 7330 FW and Professional Dev III
[1 credit hour (0, 0, 0)]
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 (2, 0, 0)]
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 7610 Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
Orientation to the Graduate Certificate in Teaming in Early Childhood. Focus on individual competencies needed to work collaboratively to meet the needs of young children with disabilities and their families.
Prerequisites: SPED 5270
Term Offered: Summer

OCCT 7620 Leadership and Advocacy in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This second seminar in the Graduate Certificate in Teaming in Early Childhood focuses on skills and policies that promote best practices in teaming to support young children with disabilities.
Prerequisites: SPED 5270 and OCCT 7610
Term Offered: Summer, Fall

OCCT 7630 Evidence-Based Practice and Innovation in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This third seminar in the Graduate Certificate in Teaming in Early Childhood provides students the opportunity to reflect on their practicum experiences in teaming to support young children with disabilities.
Prerequisites: OCCT 7620
Corequisites: OCCT 7640
Term Offered: Spring, Summer

OCCT 7640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
The practicum is an opportunity to engage in interprofessional teaming in order to provide integrated services to young children with special needs in an inclusive setting.
Prerequisites: OCCT 7620
Corequisites: OCCT 7630
Term Offered: Spring, Summer

OCCT 8050 OT Models of Practice V
[5 credit hours (5, 5, 0)]
Examines occupational therapy models of practice that support occupational performance throughout the lifespan, including prevention of occupational impairment. Examines the psychosocial aspects of disease and disability. Includes Level I fieldwork experience (56 hours). Fall Prerequisite: Occupational Therapy Models of Practice IV Corequisite: Occupational Therapy Models of Practice VI
Term Offered: Fall

OCCT 8060 OT Models of Practice VI
[4 credit hours (4, 4, 0)]
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. Includes Level I fieldwork experience (2 hours). Fall Prerequisite: Occupational Therapy Models IV Co-requisite: Occupational Therapy Models V
Term Offered: Fall

OCCT 8070 OT Models of Practice VII
[4 credit hours (0, 4, 0)]
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. Includes two Level I fieldwork experiences (20 hours). Spring Prerequisite: Occupational Therapy Models of Practice VI Corequisite: Occupational Therapy Models of Practice VIII
Term Offered: Spring

OCCT 8080 OT Models of Practice VIII
[3 credit hours (0, 3, 0)]
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. Includes Level I fieldwork experience at mental health sites (10 hours). Spring Prerequisite: Occupational Therapy Models of Practice VI Co-requisite: Occupational Therapy Models of Practice VII
Term Offered: Spring

OCCT 8120 Research in OT II
[3 credit hours (0, 0, 0)]
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 (0, 3, 0)]
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: Spring, Fall

OCCT 8140 Research in OT IV
[3 credit hours (0, 0, 0)]
Includes completion of data collection, analysis of results, submission of approved final project in journal article format, and formal presentation of the research project. Involves individual faculty contact. Fall, Spring, Summer Prerequisite: Research in Occupational Therapy III
Term Offered: Spring, Summer, Fall

OCCT 8230 OT Advocacy III
[2 credit hours (2, 0, 0)]
Examines 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. Fall Prerequisite: Occupational Therapy Advocacy II
Term Offered: Fall
OCCT 8240 OT Advocacy IV  
[3 credit hours (3, 0, 0)]  
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. Spring Prerequisite: Occupational Therapy Advocacy III  
Term Offered: Spring

OCCT 8340 FW and Professional Dev IV  
[1 credit hour (0, 0, 0)]  
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. Encourages discussion of Level I fieldwork experiences. Fall Prerequisite: Fieldwork and Professional Development Seminar II  
Term Offered: Fall

OCCT 8350 FW and Professional Dev V  
[3 credit hours (0, 0, 0)]  
Addresses issues of clinical supervision; Level II fieldwork policy, procedures, and documentation; and professional development. Provides a forum for discussion of fieldwork occupational analysis. Students develop a comprehensive Capstone Proposal. Includes Level I fieldwork experience (40 hours). Spring Prerequisite: Fieldwork and Professional Development Seminar IV  
Term Offered: Spring

OCCT 8360 Fieldwork Level II  
[3 credit hours (0, 0, 3)]  
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. Summer, Fall Prerequisite: Completion of academic content except research, which may be taken concurrently  
Term Offered: Spring, Summer, Fall

OCCT 8370 Fieldwork Level II  
[6 credit hours (0, 0, 0)]  
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. Fall Prerequisite: OCCT836 and completion of academic content except research, which may be taken concurrently  
Term Offered: Spring, Summer, Fall

OCCT 8380 Capstone Practicum  
[6 credit hours (0, 0, 0)]  
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 OCCT890 and 891 requires documentation of 640 hours. Spring Prerequisite: Level II fieldwork, competency exam, and completion of academic content except research, which may be taken concurrently. Co-requisites: Mentored Studies in Capstone Area or approved elective and Mentored Capstone Dissemination  
Term Offered: Spring, Summer

OCCT 8400 Phys Agent Mod and Non Occ Met  
[2 credit hours (2, 0, 0)]  
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 8800 Independent Study OT  
[0-12 credit hours (0, 0, 0)]  
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

OCCT 8900 Mentored Capstone Dissemination  
[3 credit hours (0, 0, 0)]  
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, Summer, Fall

OCCT 8910 Mentored Studies:Capstone Area  
[3 credit hours (0, 0, 0)]  
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, Fall
OPERATIONS & SUPPLY CHAIN MGMT (OSCM)

OSCM 5510 Business Statistics With Computer Applications
[3 credit hours (3, 0, 0)]
The application of statistics to business problem solving. Topics include descriptive statistics, probability theory, confidence intervals, hypothesis testing, sampling, ANOVA, chi-square tests, regression and correlation analysis, and concepts of business analytics.

Prerequisites: OPMT 5510 or OSCM 5510

OSCM 5520 Analysis of Manufacturing and Service Systems
[3 credit hours (3, 0, 0)]
Concepts, methods, tools and techniques for designing and managing manufacturing and service systems in the context of a supply chain are discussed. Topics include creating flexible and efficient systems for producing services and goods, total quality management, inventory management, and scheduling.

Prerequisites: OPMT 5510 or OSCM 5510

OSCM 6250 Essentials of Business Analytics
[3 credit hours (3, 0, 0)]
This course provides a broad understanding of tools, techniques and business issues in using business analytics. It introduces the students to data visualization, descriptive and predictive data analytics tools and techniques. It also provides problem formulation and solving skills in prescriptive and evaluative analytical tools (Mathematical Programming, Monte Carlo Analysis). Skills in analysis and communication of the results will be developed through use of cases and software.

OSCM 6270 Simulation and Waiting Lines
[3 credit hours (3, 0, 0)]
Students are introduced to modeling uncertainty in supply chain systems using simulation. Simulation will be introduced through spreadsheet as well as simulation software (e.g., @Risk, Simul8, ARENA). Topics such as fitting distributions, validation, verification, confidence intervals, experimental design as well as an introduction to waiting line models and comparison of simulation with analytical models will be covered.

Prerequisites: OPMT 5520 or OSCM 5520 or BUAD 3020

OSCM 6680 Quality Management and Six Sigma
[3 credit hours (3, 0, 0)]
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: OPMT 5520 or OSCM 5520 or BUAD 3020

OSCM 6690 Supply Chain Resources Management
[3 credit hours (3, 0, 0)]
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: OPMT 5520 or OSCM 5520 or BUAD 3020

OSCM 6960 Masters Thesis
[1-6 credit hours (0, 0, 0-4)]
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 or OSCM 5520

OSCM 6980 Special Topics in Operations and Supply Chain Management
[3 credit hours (3, 0, 0)]
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: OSCM 5520 or OPMT 5520

OSCM 7520 Analysis of Manufacturing and Service Systems
[3 credit hours (3, 0, 0)]
Concepts, methods, tools and techniques for designing and managing manufacturing and service systems in the context of a supply chain are discussed. Topics include creating flexible and efficient systems for producing services and goods, total quality management, inventory management, and scheduling.

Prerequisites: OPMT 5510 or OSCM 5510

OSCM 8270 Simulation and Waiting Lines
[3 credit hours (3, 0, 0)]
Students are introduced to modeling uncertainty in supply chain systems using simulation. Simulation will be introduced through spreadsheet as well as simulation software (e.g., @Risk, Simul8, ARENA). Topics such as fitting distributions, validation, verification, confidence intervals, experimental design as well as an introduction to waiting line models and comparison of simulation with analytical models will be covered.

Prerequisites: OPMT 5520 or OSCM 5520

OSCM 8680 Quality Management and Six Sigma
[3 credit hours (3, 0, 0)]
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: OPMT 5520 or OSCM 5520

OSCM 8690 Supply Chain Resources Management
[3 credit hours (3, 0, 0)]
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: OPMT 5520 or OSCM 5520 or BUAD 5520
OPERATIONS MANAGEMENT (OPMT)

OPMT 6510 Project Management
[3 credit hours (3, 0, 0)]
This course deals with managing of projects in research and development, manufacturing, construction and service organizations. Students will discuss cases and use extensively a project management software.

Prerequisites: OPMT 5520 or BUAD 3020
Term Offered: Fall
ORTHOPEDICS (ORTH)

ORTH 5600 Phys Exam Musculoskeletal Sys
[3 credit hours (3, 0, 3)]
Students will be taught to do a complete physical exam of the musculoskeletal system and how to identify common clinical pathologies. A quick review of anatomy is helpful before taking this course. May be repeated for credit.
Term Offered: Summer, Fall

ORTH 5700 Orthopaedic X-Ray Conference
[2 credit hours (0, 2, 0)]
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 (3, 0, 3)]
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 (3, 0, 3)]
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 (3, 0, 3)]
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 (3, 3, 3)]
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 (0, 0, 3)]
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 (3, 0, 3)]
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 Jml Rev Orthopaedic Science
[1 credit hour (0, 0, 1)]
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 6730 Research in Orthopaedic Sci
[0-4 credit hours (0, 0-4, 0)]
Students will participate in ongoing research programs of the members of the department faculty. Research could be clinical, theoretical, or experimental in nature. May be repeated for credit.
Term Offered: Spring, Fall

ORTH 6750 Biomaterials in Medicine
[3 credit hours (3, 0, 0)]
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 (1, 0, 0)]
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 (0, 0, 0)]
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 6930 Orthopaedic Biomechanics
[0-3 credit hours (0-3, 0-3, 0)]
Topics could range from fracture mechanics to study of different fixation devices or new prosthetic implant designs; may involve theoretical and/or experimental work. May be repeated for credit.
Term Offered: Spring, Fall

ORTH 6940 Adult Reconstruction & Tumor
[1-3 credit hours (1-3, 1-3)]
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 6950 Foot and Ankle
[1-3 credit hours (1-3, 0, 1-3)]
ORTH 6950 is a clinical elective in Foot and Ankle Surgery. Students will gain familiarity with common problems associated with the foot and ankle and how they affect a person’s gait and function. Students will have the opportunity to observe surgical procedures including fracture care, fusions of the foot or ankle and correction of deformities of the toes. Students will spend 1 – 3 hours per week with a physician in this subspecialty.

**Term Offered:** Spring

ORTH 6960 Upper Extremity and Hand
[3 credit hours (0, 3, 0)]
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 (0, 0, 3-6)]
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 (3, 0, 0)]
Biomaterials use in wide variety range of applications in medicine including drug delivery carriers and replacement of tissues.

**Term Offered:** Spring
PATHOLOGY (PATH)

PATH 6050 Clinical Neuropathology  
[1 credit hour (1, 1, 0)]

PATH 6060 Intro Surgical Path and Cytology  
[0-4 credit hours (0-4, 0-4, 0-4)]
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 (0-4, 0-4, 0-4)]
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 Intro Postmortem Pathology  
[0-4 credit hours (0-4, 0-4, 0-4)]
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 (1, 1, 0)]
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 (1-4, 1-4, 0)]
Students will participate in selected ongoing research programs of the department faculty. May be repeated for credit.

PATH 6780 Histology and Cell Physiology I  
[2 credit hours (2, 0, 0)]
The course is intended to introduce histologic techniques including tissue fixation, processing, staining, microtomy, 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

PATH 6790 Histology and Cell Physiology II  
[2 credit hours (2, 0, 0)]
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.

PATH 6780 Histology and Cell Physiology II  
[2 credit hours (2, 0, 0)]
The course is intended to introduce histologic techniques including tissue fixation, processing, staining, microtomy, 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: PATH 6780

PATH 6890 Independent Study in Pathology  
[0-12 credit hours (0, 0-12, 0)]
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 (1, 1, 0)]

PATH 7130 Pathology Case Studies  
[1-6 credit hours (0, 0, 1-6)]
Present, discuss and provide clinical pathologic correlation on various disease process. Interpret lab tests related to various diseases. Utilize laboratory testing to diagnose and manage various disease. Interact professionally with peers in the discussion of the cases.
Term Offered: Spring, Summer, Fall

PATH 8050 Clinical Neuropathology  
[1 credit hour (1, 1, 0)]

PATH 8060 Intro Surgical Path and Cytology  
[1-4 credit hours (1, 1, 0)]
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 (1, 1, 0)]
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 (1, 1, 0)]
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 (1, 1, 0)]
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 (1-4, 1-4, 0)]
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 (1, 1, 0)]
Intensive study in field of interest, including theoretical and experimental work. May be repeated for credit.
PHARMACOLOGY (PHCL) (PHCL)

PHCL 5100 Experimental Therapeutics I
[3 credit hours (3, 0, 0)]
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 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 5140 Interpretation Of Pharmaceutical Data
[2 credit hours (2, 0, 0)]
A course designed to emphasize the presentation, analysis and interpretation of data in the pharmaceutical sciences. The concepts of statistics will be discussed. Experimental design as well as appropriateness of analytical methodology and conclusions will be emphasized.
Term Offered: Summer

PHCL 5200 Experimental Therapeutics II
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

PHCL 5440 Current Topics In Interpretation Of Pharmaceutical Data
[1 credit hour (1, 0, 0)]
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)
Term Offered: Summer

PHCL 5460 Current Topics in Pharmacokinetics Toxicokinetics
[1 credit hour (1, 0, 0)]
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 or PHCL 5760 (may be taken concurrently)
Term Offered: Spring, Fall

PHCL 5500 From Experimental to Applied Therapeutics
[4 credit hours (0, 0, 4)]
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 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 5700 Pharmacology I -Principles Of Pharmacology, Autonomic Pharmacology And Non-steroidal Anti-inflammat
[3 credit hours (3, 0, 0)]
An introduction to the principles of pharmacology and the pharmacology of the autonomic system. Non-steroidal anti-inflammatory agents are also discussed.
Term Offered: Fall

PHCL 5720 Pharmacology II: Endocrine And Cns Pharmacology
[3 credit hours (3, 0, 0)]
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 or PHCL 5700
Term Offered: Spring

PHCL 5730 Toxicology I
[3 credit hours (3, 0, 0)]
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.
Prerequisites: PHCL 3700 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 5740 Pharmacology And Non-steroidal Anti-inflammat
[3 credit hours (3, 0, 0)]
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 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 5750 Toxicology II
[3 credit hours (3, 0, 0)]
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 or PHCL 5700
Term Offered: Spring
PHCL 5760 Toxicokinetics
[3 credit hours (3, 0, 0)]
The theory and practice of using kinetic principles to model the time course of toxic chemicals in the body and in the environment. Relation of the chemical time course to negative outcomes and application to risk assessment. Hands-on practice with kinetic analysis methods and software.
Term Offered: Summer, Fall

PHCL 5770 Current Topics in Toxicology I
[1 credit hour (0, 0, 1)]
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 or PHCL 5730 (may be taken concurrently)
Term Offered: Fall

PHCL 5990 Problems In Pharmacology
[1-6 credit hours (0, 0, 0)]
Tutorial or directed individual research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 6300 Research Experience in Experimental Therapeutics
[2-6 credit hours (2-6, 2-6)]
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 (1, 0, 0)]
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 (0, 0, 1-6)]
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 6600 Seminar In Pharmacology
[1 credit hour (0, 0, 1)]
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 (0, 0, 2)]
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 (3, 0, 0)]
The pharmacology of central nervous system active agents . Agents acting on the cardiovascular and renal systems are discussed.
Prerequisites: PHCL 3700 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 6720 Pharmacology IV; Chemotherapeutics
[3 credit hours (3, 0, 0)]
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 or PHCL 5700
Term Offered: Spring

PHCL 6900 M.s. Thesis Research In Pharmacology
[1-6 credit hours (0-6, 0, 0)]
M.S. thesis research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 6920 M.s. Thesis Research In Pharmacology
[1-6 credit hours (0-6, 0, 0)]
M.S. thesis research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 7100 Experimental Therapeutics I
[3 credit hours (3, 0, 0)]
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 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 7200 Experimental Therapeutics II
[3 credit hours (3, 0, 0)]
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 or PHCL 7100
Term Offered: Spring
PHCL 7440 Current Topics in Interpretation of Pharmaceutical Data
[1 credit hour (1, 0, 0)]
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)
Term Offered: Summer

PHCL 7460 Current Topics in Pharmacokinetics Toxicokinetics
[1 credit hour (1, 0, 0)]
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 or PHCL 5760 (may be taken concurrently)
Term Offered: Spring, Fall

PHCL 7500 From Experimental to Applied Therapeutics
[4 credit hours (0, 0, 4)]
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 or PHCL 5700 (may be taken concurrently)
Term Offered: Fall

PHCL 7770 Current Topics in Toxicology I
[1 credit hour (0, 0, 1)]
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 or PHCL 5730 (may be taken concurrently)
Term Offered: Fall

PHCL 8300 Research Experience in Experimental
[2-6 credit hours (2-6, 2-6, 2-6)]
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 (0, 0, 1-6)]
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 8550 Seminar in Experimental Therapeutics
[2 credit hours (0, 0, 2)]
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 (0, 0, 1-15)]
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 6010 Cardiology II
[3 credit hours (3, 0, 0)]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, and Pharmacy Practice to study the etiology, pathophysiology, clinical presentation, diagnosis, and treatment of cardiovascular diseases.
Corequisites: PHPR 6450

PHM 6030 Gastrointestinal
[2 credit hours (2, 0, 0)]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, and Pharmacy Practice to study the etiology, pathophysiology, clinical presentation, diagnosis, and treatment of gastrointestinal disorders.
Corequisites: PHPR 6450

PHM 6100 Oncology
[2 credit hours (2, 0, 0)]
An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, and Pharmacy Practice, to study of etiology, pathophysiology, clinical presentation, diagnosis, and treatment of cancer.
Corequisites: PHPR 6460

PHM 6400 Physical and Mental Effects of Psychoactive Substances
[2 credit hours (2, 0, 0)]
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
PHARMACY PRACTICE (PHPR)

PHPR 5260 Pharmacy and Healthcare Administration
[2 credit hours (2, 0, 0)]
Description and analysis of the organization, financing and delivery of healthcare in the U.S.
Term Offered: Fall

PHPR 5300 DESIGN AND APPLICATIONS OF CANCER CHEMOTHERAPY
[1 credit hour (1, 0, 0)]
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 5520 Pharmaceutical Marketing and Management
[3 credit hours (3, 0, 0)]
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 (2, 0, 0)]
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)
Term Offered: Spring, Summer

PHPR 5610 Pharmacoeconomics and Outcomes Research I
[2 credit hours (2, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Fall

PHPR 5680 Parenteral Manufacturing
[2 credit hours (2, 3, 0)]
The theory and technology of parenteral and ophthalmic formulation design, production, sterilization, packaging and stability.
Prerequisites: (PHPR 3010 and PHPR 3070)
Term Offered: Fall

PHPR 5690 Dosage Form Design
[3 credit hours (3, 3, 0)]
The utilization of pharmaceutical principles and practices for the design and manufacture of modern commercial dosage forms such as tablets, aerosols, emulsions, suspensions and solutions emphasizing biopharmaceutically efficacious products.
Prerequisites: (PHPR 3010 and PHPR 3070)
Term Offered: Spring, Fall

PHPR 5700 Equilibrium Phenomenon
[2 credit hours (2, 0, 0)]
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 (0, 0, 0-3)]
Discussion, evaluation, experimentation and production of selected dosage forms. A forum for the discussion of new dosage form technology and advances.
Prerequisites: (PHPR 3010 and PHPR 3070)
Term Offered: Spring, Summer, Fall

PHPR 5720 Pharmaceutical Rate Processes
[3 credit hours (2, 3, 0)]
A theoretical and practical application of kinetic principles applied to pharmaceutical and cosmetic systems in liquid and solid state. A mathematical treatment and development of the equations which support each reaction mechanism.
Term Offered: Fall

PHPR 5770 Advanced Drug Delivery Systems – I
[3 credit hours (3, 0, 0)]
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 are required to design a project proposal for presentation.
Term Offered: Spring, Fall

PHPR 5780 Advanced Drug Delivery Systems-2
[2 credit hours (2, 0, 0)]
This course is designed to provide students with an understanding of the current state of the art for novel drug delivery systems with a particular focus on nanocarrier systems such as nanoparticles, polymeric micelles and solid lipid nanoparticles, for delivering small molecules. This course will introduce students to recent topics in the areas of cancer therapy and site-specific drug delivery.
Prerequisites: PHPR 3020 and PHPR 3030

PHPR 5810 FINANCE AND PERSONAL PLANNING FOR PHARMACISTS
[2 credit hours (2, 0, 0)]
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
PHPR 5870 Compounding Boot Camp
[2 credit hours (0, 2, 0)]
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
Term Offered: Summer, Fall

PHPR 5990 Problems in Pharmacy Practice
[1-6 credit hours (0, 0, 0-18)]
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 (2, 0, 0)]
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.

PHPR 6070 PPD-5
[3 credit hours (3, 0, 0)]
Laboratory course to enhance the application of knowledge gained in the PPT courses, the development of clinical skills and critical thinking required for the provision of patient centered pharmaceutical care.
Prerequisites: PHPR 4080
Corequisites: PHPR 6130, PHPR 6340
Term Offered: Fall

PHPR 6080 PPD-6
[3 credit hours (3, 0, 0)]
Application of knowledge gained in the PPT, drug literature evaluation, and self care courses and the development of clinical skills and critical thinking required for the provision of pharmaceutical care.
Prerequisites: PHPR 6070
Corequisites: PHPR 6140, PHPR 6250
Term Offered: Spring

PHPR 6120 PPT-5
[3 credit hours (3, 0, 0)]
Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of pulmonary and hematologic diseases.
Term Offered: Summer

PHPR 6130 PPT-6
[4 credit hours (4, 0, 0)]
Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of cardiovascular disorders and nutrition.
Prerequisites: PHPR 6120
Corequisites: PHPR 6070
Term Offered: Fall

PHPR 6140 PPT-7
[4 credit hours (4, 0, 0)]
Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of psychiatric/neurologic disorders, pediatrics, and toxicology.
Corequisites: MBC 6320, PHCL 6320
Term Offered: Spring

PHPR 6160 Advanced Applied Pharmacokinetic
[3 credit hours (3, 0, 0)]
Detailed discussion of pharmacokinetic characteristics of drugs which are commonly included in therapeutic drug monitoring including clinical application.
Prerequisites: PHPR 4160
Term Offered: Fall

PHPR 6170 Special Populations and Topics
[3 credit hours (3, 0, 0)]
This course discusses population related differences of geriatric, pediatric, and critically ill populations. The pathophysiology, pharmacokinetics, pharmacodynamics, clinical presentation, etiology, diagnostic findings, and pharmacotherapy of common diseases as well as clinical issues specific to these populations will be presented. Enteral and parenteral nutrition therapies and poison evaluation and management will also be discussed.
Corequisites: PHPR 6460

PHPR 6210 Introduction To Research Methods
[2 credit hours (2, 0, 0)]
General overview and introduction to research process as it pertains to clinical pharmacy practice. Special emphasis given to design issues, particularly those involving human subjects.

PHPR 6220 Pharmacoeconomics and Outcomes Research
[1 credit hour (1, 0, 0)]
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.

PHPR 6230 Patient Care Rounds I
[3 credit hours (3, 0, 0)]
The course will provide students with advanced experiences in applying and integrating biomedical, psychosocial and pharmacoeconomic principles to patient care. Students will present and discuss how they would identify, prevent and resolve the medication-related problems encountered by a diversity of patient populations.

PHPR 6240 Patient Care Rounds II
[3 credit hours (3, 0, 0)]
The course will provide students with advanced experiences in applying and integrating biomedical, psychosocial and pharmacoeconomic principles to patient care. Students will present and discuss how they would identify, prevent and resolve the medication-related problems encountered by a diversity of patient populations.
Prerequisites: PHPR 6230
PHPR 6250 Self-Care
[4 credit hours (4, 0, 0)]
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.
Corequisites: PHPR 6080
Term Offered: Spring

PHPR 6260 PHCAD-3
[1 credit hour (1, 0, 0)]
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
Term Offered: Fall

PHPR 6270 Business Aspects of Pharmacy
[2 credit hours (2, 0, 0)]
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.
Prerequisites: PHPR 6450

PHPR 6280 PHCAD-4
[2 credit hours (2, 0, 0)]
This course focuses on developing, implementing, and evaluating Medication Therapy Management (MTM) and Disease State Management (DSM) programs.
Prerequisites: PHPR 6260
Term Offered: Spring

PHPR 6290 Medication Therapy and Disease State Management for Masters Students
[2 credit hours (2, 0, 0)]
Focuses on developing, implementing, and evaluating Medication Therapy Management and Disease State Management programs.

PHPR 6300 Fluids Electrolytes and Kidney Disease
[2 credit hours (2, 0, 0)]
This course discusses the pharmacology, pathophysiology, diagnosis and therapeutics related to fluids, electrolytes, acid and base disorders, diuretics and kidney disease. Selected disorders of the kidney including acute, chronic and end stage kidney disease, and renal replacement therapy.
Corequisites: PHPR 6450

PHPR 6310 Jurisprudence and Ethics
[1 credit hour (0, 1, 0)]
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 6340 RESEARCH DESIGN AND DRUG LITERATURE EVALUATION 2
[2 credit hours (2, 0, 0)]
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
Corequisites: PHPR 6070
Term Offered: Fall

PHPR 6370 Nutrition
[1 credit hour (1, 0, 0)]
An overview of the fundamental principles of nutritional support and the pharmacist's role in providing nutritional support services.

PHPR 6380 Pathophysiology And Pharmacotherapy: Endocrinology
[2 credit hours (2, 0, 0)]
Discussion of the pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of endocrine disorders.
Term Offered: Spring

PHPR 6400 Topics in Internal Medicine
[2 credit hours (2, 0, 0)]
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: Summer

PHPR 6410 Leadership: Principles and Practice
[2 credit hours (2, 0, 0)]
This course will facilitate student discovery of the concept of self-betrayal and how it impacts the different relationships in their lives. 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? The content will be facilitated by the instructor through student reading, self-reflection, and group discussion. Once we have discussed possible solutions to the 3 questions, we will also take a deeper look at how this material impacts some of the different pharmacy and healthcare related areas students will encounter.
Term Offered: Summer

PHPR 6460 Pharmacy Skills Development - 5
[2 credit hours (1, 1, 0)]
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 (1, 1, 0)]
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
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<td>A theoretical and practical examination of the pharmaceutical</td>
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<td><strong>Term Offered:</strong> Spring, Fall</td>
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<tr>
<td>PHPR 6530</td>
<td>Research Methods In Pharmacy Practice</td>
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<td></td>
<td>Spring</td>
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<td></td>
<td>An introduction to research methods and principles used in designing,</td>
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<td></td>
<td>planning, implementing, analyzing and interpreting research projects in</td>
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<td></td>
<td>pharmacy practice.</td>
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<td><strong>Term Offered:</strong> Spring</td>
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<tr>
<td>PHPR 6550</td>
<td>Management Topics For Clinical Practice</td>
<td>2</td>
<td>PHPR 4520</td>
<td>Spring</td>
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<td></td>
<td>Description of nature of management, basic management concepts and</td>
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<td>tools and environmental concerns pertinent to pharmacy practice in all of</td>
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<td>its practice settings.</td>
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<td><strong>Term Offered:</strong> Spring</td>
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<tr>
<td>PHPR 6600</td>
<td>Seminar In Administrative Pharmacy</td>
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<td>Spring, Fall</td>
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<td></td>
<td>A critical analysis of current problems in pharmacy practice with</td>
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<td>individual case presentations.</td>
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<td><strong>Term Offered:</strong> Spring, Fall</td>
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<tr>
<td>PHPR 6610</td>
<td>Seminar I</td>
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<td>Spring, Fall</td>
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<td></td>
<td>Instruction on preparation and presentation of clinical and/or scientific</td>
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<td>seminars.</td>
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<td><strong>Term Offered:</strong> Spring, Fall</td>
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<tr>
<td>PHPR 6670</td>
<td>Chemical Dependency And The Pharmacist</td>
<td>3</td>
<td></td>
<td>Summer</td>
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<tr>
<td></td>
<td>Overview of chemical dependency and substance abuse, with emphasis on</td>
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<td>the neuropathophysiology of dependency and the pharmacology of drugs of</td>
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<td></td>
<td>abuse. Also include extensive review of the impact of chemical dependency</td>
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<td>on the healthcare professional, with as focus on their impact to pharmacists.</td>
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<td><strong>Term Offered:</strong> Summer</td>
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<tr>
<td>PHPR 6700</td>
<td>Special Topics in Diabetes Care</td>
<td>2</td>
<td>PHPR 3140</td>
<td>Summer</td>
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<td>This course focuses on advanced and special polulation topics in the area</td>
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<td>of diabetes care and management through discussions, lecture-based</td>
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<td>teaching and group activities.</td>
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<td><strong>Prerequisites:</strong> PHPR 3140</td>
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<td><strong>Term Offered:</strong> Summer</td>
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<tr>
<td>PHPR 6800</td>
<td>Monitoring Therapy</td>
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<td></td>
<td>Summer</td>
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<td></td>
<td>An introduction to medical terminology and procedures with reference to</td>
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<td>physical exam, patient history, common diagnostic procedures and</td>
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<td>applications to drug and disease state monitoring.</td>
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<td><strong>Term Offered:</strong> Summer</td>
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<tr>
<td>PHPR 6810</td>
<td>Hospital Pharmacy Administration</td>
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<td>Fall</td>
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<td></td>
<td>An examination of the administrative and supervisory aspects of hospital</td>
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<td></td>
<td>pharmacy practice. Emphasis is placed on management techniques rather than</td>
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<td>functions performed.</td>
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<td><strong>Term Offered:</strong> Spring, Summer, Fall</td>
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<tr>
<td>PHPR 6820</td>
<td>Selected Topics In Hospital Pharmacy</td>
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<td>Summer</td>
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<td></td>
<td>A treatment of contemporary trends which influence the practice of hospital</td>
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<td>pharmacy such as drug distribution systems. Emphasis is placed upon</td>
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<td>these concepts in light of the resources present.</td>
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<td><strong>Term Offered:</strong> Fall</td>
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<td>PHPR 6830</td>
<td>Advanced Community Pharmacy Administration</td>
<td>3</td>
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<td>Fall</td>
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<td></td>
<td>An advanced analysis of concepts, practices and issues related to retail</td>
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<td>pharmacy management.</td>
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<td><strong>Term Offered:</strong> Fall</td>
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<tr>
<td>PHPR 6840</td>
<td>Selected Topics In Community Pharmacy</td>
<td>3</td>
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<td></td>
<td>Examination of contemporary trends influencing community pharmacy,</td>
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<td>such as home healthcare and prescription drug programs. Emphasis is placed</td>
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<td>on the impact of these trends on community pharmacy management.</td>
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<td><strong>Term Offered:</strong> Fall</td>
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<td>PHPR 6850</td>
<td>Product Development Laboratory</td>
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<td>Spring</td>
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<td></td>
<td>A study of various stages of development of pharmaceutical products. The</td>
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<td>student will develop formulations, using stability data and production</td>
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<td>technology for three products.</td>
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<td><strong>Prerequisites:</strong> PHPR 5690</td>
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<td><strong>Term Offered:</strong> Spring</td>
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<tr>
<td>PHPR 6860</td>
<td>Advanced Drug Delivery Lab</td>
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<td></td>
<td>Spring</td>
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<td>This lab course is designed to provide students hands-on experience and</td>
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<td>improve their practical knowledge in areas of industrial pharmacy and</td>
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<td>advanced pharmaceutics. This course would introduce students to the</td>
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<td>wide range of cutting-edge techniques in the pharmaceutical industry.</td>
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<td><strong>Term Offered:</strong> Spring</td>
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<tr>
<td>PHPR 6890</td>
<td>M.s. Project In Administrative Pharmacy</td>
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<td>Spring</td>
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<td>Development of a practical project in the pharmacy environment on a practical</td>
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<td>practicum basis. A written, bound report and oral presentation are</td>
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<td>required.</td>
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<td><strong>Term Offered:</strong> Spring, Fall</td>
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<td>PHPR 6920</td>
<td>Introductory Pharmacy Practice Experience 5</td>
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<td>PHPR 4920</td>
<td>Spring, Summer, Fall</td>
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<td>Third professional year course designed to enhance professional growth</td>
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<td>through application of skills and knowledge gained in IPPE-1 and IPPE-2</td>
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<td>to various areas of pharmacy practice to provide the best possible patient</td>
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<td>care.</td>
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<td><strong>Prerequisites:</strong> PHPR 4920</td>
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<td><strong>Term Offered:</strong> Spring, Summer, Fall</td>
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<td>PHPR 6940</td>
<td>Early Practice Exposure</td>
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<td>Supervised instruction and participation in pharmacy practice at actual</td>
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<td>practice sites such as community, hospital, managed care, long-term care</td>
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<td>and nuclear pharmacies.</td>
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PHPR 6950 Seminar In Industrial Pharmacy
[1 credit hour (0, 0, 1)]
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 (0, 0, 0-18)]
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 6980 Special Topics
[1-5 credit hours (0, 0, 0-5)]
Selected study of topics in Pharmacy Practice. New pharmacy and healthcare strategies are examined in detail.
Term Offered: Spring

PHPR 8260 Jurisprudence & Ethics For Pharmacy
[1 credit hour (1, 0, 0)]
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.

PHPR 8540 Patient Monitoring Principles
[3 credit hours (2, 0, 6)]
Application of didactic geriatric drug therapy principles in a geriatric patient care environment. Emphasis will be placed on geriatric drug monitoring skills.
Prerequisites: PHPR 4140
Corequisites: PHPR 8500
Term Offered: Summer

PHPR 8620 Seminar II
[2 credit hours (0, 0, 2)]
Discussion of current topics relating to pharmacy practice.
Prerequisites: PHPR 6610

PHPR 8630 Longitudinal Drug Information
[2 credit hours (0, 0, 2)]
Presentation of clinical and/or scientific seminar and completion of in-depth pharmacy practice related paper.
Term Offered: Spring, Summer, Fall

PHPR 8940 Clinical Clerkship
[4 credit hours (0, 0, 16)]
Advanced clinical experience in various specialties of medicine and pharmacy. This course will consist of 340 practicum/internship hours for each section (2 months).
Term Offered: Spring, Summer, Fall

PHPR 8980 Special Topics
[1-5 credit hours (0, 0, 0-5)]
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 (0, 0, 0)]
The properties of hormone receptors and the biochemical consequences of hormone-receptor interactions. May be repeated for credit. 
Term Offered: Fall
PHILOSOPHY (PHIL)

PHIL 5210 Ancient Philosophy Seminar
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
An intensive study of European philosophy after Kant, including Hegel, Marx, Kierkegaard and Nietzsche.
Term Offered: Fall

PHIL 5250 Phenomenology
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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

PHIL 5270 American Philosophy
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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: Fall

PHIL 5400 Ethics Seminar
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 0-3)]
Directed study in philosophy under supervision of a philosophy faculty member.
Term Offered: Spring, Summer, Fall

PHIL 6000 Advanced Logic
[3 credit hours (0, 0, 3)]
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 (0, 0, 0-6)]
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 6930 Seminar
[3 credit hours (0, 0, 3)]
Advanced philosophy seminar open only to graduate students.

PHIL 6960 Thesis
[1-16 credit hours (0, 0, 0-2)]
PHYSICAL EDUCATION (PED)

PED 5170 Adapted Physical Education
[3 credit hours (3, 0, 0)]
Study of disabling conditions as related to physical education. Assessment and consequent development of IEP. Exercise prescription analysis and technique. Program implications for inclusion.
Term Offered: Fall

PED 5250 Curriculum In Physical Education
[3 credit hours (3, 0, 0)]
Perspectives in curriculum theory and design for physical education. Procedures for development of curriculum K-12.
Term Offered: Fall

PED 5610 Trends And Issues In Physical Education
[3 credit hours (3, 0, 0)]
Analysis of contemporary trends and issues facing the physical educator. Content varies per semester: Children and Sport, Sport Sociology, Elementary/Secondary Teaching.
Term Offered: Spring, Fall

PED 5620 Effective Supervision In Physical Education
[3 credit hours (3, 0, 0)]
Procedures and methods appropriate for supervision of student teachers or inservice teachers in the area of physical education. Computer analysis, observation techniques, conferencing skills and evaluation procedures are stressed.
Term Offered: Fall

PED 5950 Workshop In Exercise Science And Physical Education
[1-4 credit hours (0-4, 0, 0)]
Topical workshops developed around areas of interest and concern to inservice teachers and/or exercise scientists. Credit cannot be applied towards a degree program without prior consent of adviser.
Term Offered: Fall

PED 6920 Master's Project In Exercise Science/Physical Education
[1-4 credit hours (0, 0, 0-4)]
A research project is required for the M.Ed. program for the culminating experience.
Term Offered: Summer, Fall

PED 6940 Internship In Exercise Science
[1-12 credit hours (0, 0, 0-36)]
A field internship designed to supplement classroom experience by providing participation in the area of exercise science through participant-observer experience.
Term Offered: Spring

PED 6960 Master's Thesis In Exercise Science/Physical Education
[1-4 credit hours (0, 0, 0-4)]
Research thesis is required for M.S. and M.Ed. programs for the culminating experience.

PED 6990 Independent Study In Exercise Science/Physical Education
[1-4 credit hours (0, 0, 0-4)]
The student will participate in independent readings, laboratory research, field experience and other activities not suited for class instruction. May be repeated for course credit.
Term Offered: Summer, Fall
PHYSICAL THERAPY (PHYT)

PHYT 5000 Gross Anatomy
[4 credit hours (4, 0, 0)]
Students will study the structure of the human body using the strucfunction 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 (0, 0, 0)]
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
[4 credit hours (4, 0, 0)]
This course is an integrated study of applied biomechanics, kinesiology, and anatomy as they relate specifically to the analysis of human movement. Observational skills will be emphasized for analysing human movement, although students will be introduced to the use of other evaluation tools such as EMG motion analysis, and videography. Progressing from simple movements to those that are more complex and from normal to pathological, students will learn to integrate observational skills with an understanding of musculoskeletal function and neuromuscular control. Using cases of pathological conditions student will practice hypothesis generation and identification of examination data necessary for effective clinical reasoning. PhyT500 Gross Anatomy is a prerequisite and provides a foundation for the objectives this course hopes to achieve.
Prerequisites: PHYT 5000 or PHYT 500
Term Offered: Fall

PHYT 5070 Neuroscience
[3 credit hours (0, 0, 0)]
An integrated study of structure-function relationship in the central and peripheral nervous systems, emphasizing the neuromuscular control of movement. Content serves as the foundation for discussion in PHYT508.
Term Offered: Spring

PHYT 5080 Neuroscience Seminar
[1 credit hour (0, 0, 0)]
Principles of neurophysiological and neuropathological sensory and motor function will be applied to clinical manifestations of neurological impairments commonly seen in PT settings. Procurement of basic assessment skills for clients with neuromuscular impairments will provide the clinical focus for integration of foundation neuroscience information with clinical practice.
Term Offered: Spring

PHYT 5110 Clinical Pathophysiology I
[1 credit hour (1, 0, 0)]
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: Summer

PHYT 5120 Clinical Pathophysiology II
[3 credit hours (3, 0, 0)]
Second of 2 courses that address the integrated study of normal physiological and pathophysiological processes in human body at cellular, organ, and systemic levels - emphasizes on clinical manifestations and impact on PT plan of care.
Term Offered: Fall

PHYT 5170 Evidence Based Practice I
[2 credit hours (0, 0, 0)]
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: Spring

PHYT 5180 Evidence Based Practice II
[2 credit hours (0, 0, 0)]
The second of a two course series on the principles of measurement and research design, with an emphasis on the statistical analysis procedures commonly used in clinical research. The critical evaluation and analysis of research studies relevant to clinical practice will also be emphasized.
Term Offered: Summer

PHYT 5270 Applied Exercise Physiology
[3 credit hours (0, 0, 0)]
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 (0, 0, 0)]
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 (2, 0, 0)]
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 Exer
[2 credit hours (2, 0, 0)]
Application of scientific principles in anatomy, applied biomechanics, and
teaching 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 Intro to Examination
[2 credit hours (0, 0, 0)]
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),
pain, peripheral pulses and edema; goniometry; and strength
testing.
Term Offered: Fall

PHYT 5450 Foundations of PT
[2 credit hours (0, 0, 0)]
Addresses the professional socialization process. Professional codes and
and guidelines 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: Spring

PHYT 5610 Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
Orientation to the Graduate Certificate in Teaming in Early Childhood.
Focus on individual competencies needed to work collaboratively to meet
the needs of young children with disabilities and their families.
Prerequisites: SPED 5270
Term Offered: Summer

PHYT 5620 Leadership and Advocacy in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This second seminar in the Graduate Certificate in Teaming in Early
Childhood focuses on skills and policies that promote best practices in
teamwork to support young children with disabilities.
Prerequisites: SPED 5270 and PHYT 5610
Term Offered: Summer, Fall

PHYT 5630 Evidence-Based Practice and Innovation in Interprofessional
Teaming
[1 credit hour (0, 0, 1)]
This third seminar in the Graduate Certificate in Teaming in Early
Childhood provides students the opportunity to reflect on their practicum
experiences in teaming to support young children with disabilities.
Prerequisites: SPED 5270 and PHYT 5610 and PHYT 5620
Corequisites: PHYT 5640
Term Offered: Spring, Summer

PHYT 5640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
The practicum provides an opportunity to engage in interprofessional
teaming in order to provide integrated services to young children with
special needs in an inclusive setting.
Prerequisites: PHYT 5620
Corequisites: PHYT 5630
Term Offered: Spring, Summer

PHYT 5650 Pharmacology of PT
[1 credit hour (0, 0, 0)]
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 (0, 0, 0)]
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: Summer

PHYT 5850 Integrated Clinical Experience I
[2 credit hours (0, 0, 0)]
The first of two full-time, integrated clinical education experiences.
Students are engaged in clinical observation and supervised practice in
a 4 week clinical education experience completed at the end of the first
year of the DPT program. This course emphasizes the development of
beginning skills in patient management, safety, clinical reasoning, and
professional conduct in various clinical practice settings.
Term Offered: Spring

PHYT 5860 Clinical Practicum II
[1 credit hour (0, 0, 0)]
Clinical observation and supervised application of advancing physical
therapy skills at the same clinical facility as Clinical Practicum I. An
emphasis will be on continued progression in the generic abilities and a
more focused approach toward the development of specific technical,
cognitive or affective areas in need of improvement as identified during
Clinical Practicum I.
Term Offered: Summer

PHYT 6020 Lifespan II
[2 credit hours (0, 0, 0)]
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: Spring

PHYT 6050 Hlth Care Policy and Delivery
[1 credit hour (0, 0, 0)]
Overview of the origins and components of the American health care
system and major policy initiatives that influence it. Access, cost, and
quality factors in health care delivery will be explored. Serves as a
starting point for the student's study of the continuously expanding
sector of the American economy in which they will practice.
Term Offered: Spring, Fall
PHYT 6100 Health Promotion
[2 credit hours (2, 0, 0)]
Discussion and application of the elements of health and wellness as described by Healthy People 2010. Emphasis on health assessment, obesity, physical activity, nutrition, complementary/alternative management, and behavior modification strategies.
Term Offered: Fall

PHYT 6170 Scholarly Project I
[2 credit hours (0, 0, 0)]
The student will initiate the formal research process through refinement of a research/scholarly project proposal and, if necessary, submission of the proposal to the Institutional Review Board for human subjects for approval.
Term Offered: Fall

PHYT 6180 Scholarly Project II
[2 credit hours (0, 0, 0)]
Includes completion of data collection, analysis of the data, and initial preparation of a scholarly paper, in accordance with specific manuscript guidelines.
Term Offered: Spring

PHYT 6190 Scholarly Project III
[1 credit hour (0, 0, 0)]
Includes the final preparation of a scholarly paper which must meet the guidelines established by the College of Graduate Studies, and the oral defense/presentation of the scholarly project as required by the College of Graduate Studies.
Term Offered: Summer, Fall

PHYT 6260 Cardiovascular-Pulmonary PT
[3 credit hours (0, 0, 0)]
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 Teaching and Learning
[2 credit hours (0, 0, 0)]
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 (0, 0, 0)]
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 (0, 0, 0)]
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 lumbo pelvic 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 (0, 0, 0)]
Theories and principles of client examination, evaluation, PT diagnosis, prognosis, and therapeutic intervention for clients with stroke and spinal cord injury. Historic and modern evidence-based treatment approaches for the neurologic patient, in general, will be discussed with emphasis on the approach's influence in the design of a PT plan of care.
Term Offered: Fall

PHYT 6610 Neuromuscular Rehab II
[3 credit hours (0, 0, 0)]
Principles of rehabilitation for clients with chronic neuromuscular impairments and long-term disability. Emphasis on theories, philosophies, and the PT plan of care including examination, evaluation, and intervention strategies. Includes pediatric module.
Term Offered: Spring

PHYT 6700 Professional Issues
[1 credit hour (1, 0, 0)]
Prerequisite: PHYT685 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: Fall

PHYT 6720 Special Topics in PT
[2 credit hours (0, 0, 0)]
Intensive exploration of a topic related to the profession of physical therapy and designed to meet the student's special interest and professional goals. Subject matter will vary depending upon student interest.
Term Offered: Spring, Fall

PHYT 6740 Clinical Seminar I
[1 credit hour (0, 0, 1)]
First of a series of two courses, this course emphasizes the application of clinical skills learned in didactic coursework and begins to develop problem-solving and critical thinking for a variety of diagnoses and practice settings using a variety of patient scenarios. An emphasis is placed on evidence-based decision-making, basic evaluation, intervention planning, as well as beginning evaluation of one's own clinical reasoning processes and skills.
PHYT 6750 Clinical Seminar II
[1 credit hour (0, 0, 0)]
The second of a series of two courses, this course emphasizes the application of clinical skills and the integration of problem-solving and critical thinking for a variety of diagnoses and practice settings using a variety of patient scenarios. 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 Integrated Clinical Experience II
[5 credit hours (0, 0, 0)]
The second of two full-time, integrated clinical education experiences. Students are engaged in clinical observation and supervised practice in a 10 week clinical education experience completed at the end of the second year of the DPT program. This course emphasizes the development of intermediate skills in patient management, safety, clinical reasoning, and professional conduct in an inpatient or outpatient practice setting.
Term Offered: Summer

PHYT 6990 Independent Study in PT
[0-4 credit hours (0, 0, 0)]
In-depth exploration and study of clinically related problems or topic of interest. May be repeated for credit.
Term Offered: Spring, Summer, Fall

PHYT 7050 Practice Management
[2 credit hours (0, 0, 0)]
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: Spring, Fall

PHYT 7100 Integrated Patient Management
[4 credit hours (4, 0, 0)]
This course emphasizes an integrated and comprehensive approach to patient care for the management of complex cases with clinical ambiguity and that involve multi-system pathology or psychosocial dynamics. Patient cases will be presented to the students who are then expected to differentiate signs and symptoms of pathologies, determine patient “readiness” for PT management, develop and conduct a patient screen, design a PT plan of care, and determine a plan for discharge.
Prerequisites: PHYT 685 or PHYT 6850
Term Offered: Fall

PHYT 7200 Scholarly Project IV
[1 credit hour (0, 0, 0)]
The course includes the final preparation of a scholarly paper including the oral defense/presentation and submission of the final paper to the Department of Physical Therapy.
Prerequisites: PHYT 617 or PHYT 6170
Term Offered: Spring, Fall

PHYT 7620 Trauma Rehab
[2 credit hours (0, 0, 0)]
Integrated study of the principles of rehabilitation for clients who have sustained substantial trauma including, but not limited to: TBI, multiple fractures and burns. Students will be asked to integrate previous coursework in making decisions regarding the role of PT in the interdisciplinary management throughout the continuum of care for clients who have multi-system impairments due to physical trauma.
Prerequisites: Upper Division with a score of 1
Term Offered: Fall

PHYT 7790 Internship I
[6 credit hours (0, 0, 5)]
The first of two full-time, supervised internships completed following the culmination of the didactic portion of the DPT program. Students are engaged in supervised practice in a 10 week internship that emphasizes development toward entry-level PT competencies in all the components of professional practice and patient management in an inpatient or outpatient practice setting.
Term Offered: Fall

PHYT 7900 Internship II
[6 credit hours (0, 0, 5)]
The final full-time, supervised internship completed following the culmination of the didactic portion of the DPT program. Students are engaged in supervised practice in a 12 week internship that emphasizes development of entry-level PT competencies in all the components of professional practice and patient management in various clinical practice and specialty settings.
Term Offered: Spring

PHYT 7990 Specialty Internship
[4 credit hours (0, 0, 0)]
Extended period of supervised, advanced clinical practice and/or formal experience in administrative or professional organizational environments, which is designed to meet the student’s special interests and professional goals.
Term Offered: Spring, Fall
PHYSICIAN ASSISTANT (PHYA)

PHYA 5010 Introduction to PA Profession
[1 credit hour (1, 0, 0)]
An overview of the history and philosophy of the physician assistant profession. Includes a review of current professional issues relevant to the PA profession.
Term Offered: Spring, Fall

PHYA 5100 Principle Interview/Medical History
[3 credit hours (3, 3, 3)]
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
[3 credit hours (3, 3, 0)]
Students will develop the knowledge and skills to competently perform a complete physical examination, 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 (2, 0, 0)]
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 (2, 2, 0)]
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
[1 credit hour (1, 1, 0)]
Introduction to the use and interpretation of commonly used diagnostic and therapeutic tools, including laboratory studies, radiographic studies, and electrocardiography.
Term Offered: Summer

PHYA 5230 Diagnostic and Therapeutic Skills III
[2 credit hours (2, 0, 0)]
Introduction to the use and interpretation of commonly used diagnostic and therapeutic tools, including laboratory studies, radiographic studies, and electrocardiography.
Term Offered: Fall

PHYA 5310 Clinical Medicine I
[4 credit hours (4, 0, 0)]
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 (6, 0, 0)]
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
[3 credit hours (3, 0, 0)]
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: Summer

PHYA 5400 Pathophysiology I
[2 credit hours (2, 0, 0)]
An overview of physiological and pathologic processes that influence the human organism at the cellular, organ and systemic levels.
Term Offered: Spring

PHYA 5410 Pathophysiology II
[2 credit hours (2, 0, 0)]
An overview of physiological and pathologic processes that influence the human organism at the cellular, organ and systemic levels.
Term Offered: Summer

PHYA 5430 Pathophysiology III
[2 credit hours (2, 0, 0)]
An overview of physiological and pathologic processes that influence the human organism at the cellular, organ and systemic levels.
Prerequisites: PHYA 5400 and PHYA 5410
Term Offered: Fall

PHYA 5510 Fundamentals of Pharmacology I
[2 credit hours (2, 0, 0)]
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
[2 credit hours (2, 0, 0)]
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
[2 credit hours (2, 2, 0)]
A study of the general principles of pharmacotherapeutics and the rational use of drugs for the diagnosis, prevention and treatment of diseases.
Term Offered: Fall

PHYA 6010 Basic Genetics
[1 credit hour (1, 0, 1)]
This course will provide an introduction to human genetics with an emphasis on medical aspects including common genetic disorders, cytogenetics, molecular genetics, cancer genetics, prenatal diagnosis, and genetic counseling.
Term Offered: Summer
PHYA 6040 Introduction to Clinical Radiology  
[1 credit hour (0, 0, 1)]  
Introducing the student to clinical medicine by providing the student with practical experience in radiology.  
Term Offered: Summer  
PHYA 6050 Ethics for PA Profession  
[2 credit hours (2, 0, 0)]  
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 Health Promo Disease Prevention  
[1 credit hour (1, 0, 0)]  
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 Principle of Research and Statistics  
[2 credit hours (2, 0, 0)]  
Presentation of methods of research and their application to clinical research in clinical practice. Present useful knowledge and understanding of the basic language, logic and methods of research design and statistical analysis.  
Term Offered: Fall  
PHYA 6150 Behavioral Science  
[2 credit hours (2, 0, 0)]  
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 I  
[2 credit hours (2, 0, 0)]  
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.  
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)  
Term Offered: Spring, Summer, Fall  
PHYA 6320 Clinical Rotation II  
[2 credit hours (2, 0, 0)]  
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.  
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)  
Term Offered: Spring, Summer, Fall  
PHYA 6330 Clinical Rotation III  
[2 credit hours (2, 0, 0)]  
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.  
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)  
Term Offered: Spring, Summer, Fall  
PHYA 6340 Clinical Rotation IV  
[2 credit hours (2, 0, 0)]  
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.  
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)  
Term Offered: Spring, Summer, Fall  
PHYA 6350 Clinical Rotation V  
[2 credit hours (2, 0, 0)]  
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.  
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)  
Term Offered: Spring, Summer, Fall  
PHYA 6360 Clinical Rotation VI  
[2 credit hours (2, 0, 0)]  
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.  
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)  
Term Offered: Spring, Summer, Fall
PHYA 6370 Clinical Rotation VII
[2 credit hours (2, 0, 0)]
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)
Term Offered: Spring, Summer, Fall

PHYA 6380 Clinical Rotation VIII
[2 credit hours (2, 0, 0)]
A three semester practicum, covering eight 4-week clinical rotations, which provides supervised long term care, inpatient, emergency services and ambulatory primary care clinical experiences for physical assistant students. Students will demonstrate the ability to integrate knowledge and skill in the evaluation and treatment of patients and their families. Emphasis will also be placed on assimilation of the physician assistant professional role. Students will be required to return to campus for an End of Rotation Day (EOR Day) on the last day of each clinical rotation.
Prerequisites: PHYA 6500 (may be taken concurrently) or PHYA 650 (may be taken concurrently)
Term Offered: Spring, Summer, Fall

PHYA 6410 Clinical Practice - ER
[1 credit hour (0, 0, 0)]
To provide the students with the opportunity to gain medical knowledge, develop proficiency and directed practical experience working directly with patients and health care personnel.
Term Offered: Spring, Summer, Fall

PHYA 6420 Clinical Practice - Family Medicine
[2 credit hours (0, 0, 0)]
To provide the students with the opportunity to gain medical knowledge, develop proficiency and directed practical experience working directly with patients and health care personnel.
Term Offered: Spring, Fall

PHYA 6430 Clinical Practice - Internal Medicine
[2 credit hours (0, 0, 0)]
To provide the students with the opportunity to gain medical knowledge, develop proficiency and directed practical experience working directly with patients and health care personnel.
Term Offered: Spring

PHYA 6440 Clinical Practice - Pediatrics
[2 credit hours (0, 0, 0)]
To provide the students with the opportunity to gain medical knowledge, develop proficiency and directed practical experience working directly with patients and health care personnel.
Term Offered: Spring, Fall

PHYA 6450 Clinical Practice - Surgery
[2 credit hours (0, 0, 0)]
To provide the students with the opportunity to gain medical knowledge, develop proficiency and directed practical experience working directly with patients and health care personnel.
Term Offered: Spring, Summer, Fall

PHYA 6500 Introduction to Clinical Practice
[1 credit hour (1, 0, 0)]
Students will review history taking and patient interview skills and patient evaluation skills. Clinical orientation will consist of clinical assignments and review of clinical manual. Students will acquire ACLS certification.
Term Offered: Spring

PHYA 6600 Research Practicum
[1 credit hour (0, 0, 0)]
Students will develop and implement a scholarly project under the supervision of the student's major advisor.
Term Offered: Spring

PHYA 6610 Scholarly Project I
[1 credit hour (0, 0, 1)]
Students will develop and implement a scholarly project related to their professional goals. The project is negotiated between the student and the student's advisory committee.
Term Offered: Spring

PHYA 6620 Scholarly Project II
[1 credit hour (0, 0, 0)]

PHYA 6630 Scholarly Project III
[1 credit hour (0, 0, 0)]

PHYA 6640 Scholarly Project IV
[1 credit hour (0, 0, 0)]

PHYA 6650 Scholarly Project V
[1 credit hour (0, 0, 0)]

PHYA 6660 Scholarly Project VI
[1 credit hour (0, 0, 0)]

PHYA 6670 Scholarly Project VII
[1 credit hour (0, 0, 0)]

PHYA 6680 Scholarly Project VIII
[1 credit hour (0, 0, 0)]

PHYA 6690 Scholarly Project IX
[1 credit hour (0, 0, 0)]

PHYA 6760 Clinical Preceptorship
[4 credit hours (0, 0, 4)]

PHYA 6890 PA Independent Study
[0-4 credit hours (0, 0, 0-4)]
The student and instructor will agree on a program of study that will enable the student to achieve his/her objectives. Requires approval of the Program Director. May be repeated for credit.
Term Offered: Spring, Summer, Fall
PHYSICS (PHYS)

PHYS 5210 Theoretical Mechanics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Maxwell's equations and their solutions; electromagnetic radiation.
Prerequisites: PHYS 5230
Term Offered: Spring

PHYS 5310 Quantum Mechanics
[3 credit hours (3, 0, 0)]
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 5510 Condensed Matter Physics
[3 credit hours (3, 0, 0)]
Term Offered: Spring, Fall

PHYS 5620 The Physics Of Lasers
[3 credit hours (3, 0, 0)]
Longitudinal and transverse coherence, stimulated emission, optical pumping, resonator structures, Q-switching, mode-locking and laser systems (gas, dye, diode, doped insulator and free electron lasers).
Term Offered: Spring, Fall

PHYS 5800 Astronomy In The Planetarium
[3 credit hours (3, 0, 0)]
Theory and practice of astronomical outreach programming. Sky and calendar, mythology, constellations, astrophysics, buying and using small telescopes, operating and maintaining planetarium projectors, sky simulation software, projects and program production.

PHYS 5810 Astrophysics I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring
PHYS 6250 Classical Electrodynamics I
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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
Term Offered: Fall

PHYS 6280 Photovoltaic Materials And Device Physics Laboratory
[3 credit hours (0, 3, 0)]
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 and PHYS 7140
Term Offered: Fall

PHYS 6320 Quantum Mechanics I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 6490 Current Issues In Theoretical Physics
[3 credit hours (3, 0, 0)]
Problems in theory relative to the research programs pursued at the University.

PHYS 6520 Condensed Matter Physics I
[3 credit hours (3, 0, 0)]
A study of the electromagnetic, thermal and elastic properties of condensed matter through the quantum-mechanical treatment of the electrons and elementary excitations.
Prerequisites: PHYS 6330

PHYS 6530 Condensed Matter Physics II
[3 credit hours (3, 0, 0)]
A survey of condensed matter phenomena of interest to experimentalists, as elucidated by theory.
Prerequisites: PHYS 6330

PHYS 6540 Structure, Defects And Diffusion
[4 credit hours (4, 0, 0)]
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 (4, 0, 0)]
A materials science approach to the thermodynamics of condensed state equilibria and phase transformation kinetics.
Prerequisites: PHYS 6450
Term Offered: Spring

PHYS 6570 Atomic Physics
[3 credit hours (3, 0, 0)]
A study of the fundamental properties of atoms, their theoretical description and experimental measurement. Topics include atomic structure, radiative transitions, external field interactions and atomic collisions.
Term Offered: Fall

PHYS 6710 Atomic & Molecular Spectroscopy
[3 credit hours (3, 0, 0)]
Theory and experimental methods of atomic and molecular spectroscopy. Topics include the theory of interpretation of atomic and molecular spectra and the experimental means to measure the spectra.
Prerequisites: PHYS 6710

PHYS 6770 Accelerator Physics
[3 credit hours (3, 0, 0)]
Basic electrodynamic functioning of charged-particle accelerators, particle dynamics of non-relativistic and relativistic accelerators, accelerator applications, static field and dynamic field accelerator designs.
PHYS 6810 Stellar Astrophysics I
[3 credit hours (3, 0, 0)]
Term Offered: Fall

PHYS 6820 Stellar Astrophysics II
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (1-6, 0, 0)]
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 (0, 0, 0)]
Thesis research required for the M.S. degree.
Term Offered: Spring, Summer, Fall

PHYS 6980 Special Topics
[1-4 credit hours (0-4, 0, 0)]
Course reserved for visiting lecturers and topics not covered otherwise.
Term Offered: Spring, Summer, Fall

PHYS 6990 Independent Study
[1-4 credit hours (0, 0, 0)]

PHYS 7130 Computational Physics For Research
[3 credit hours (3, 0, 0)]

PHYS 7140 Fundamentals Of Modern Physics
[3 credit hours (3, 0, 0)]
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 (0, 0-6, 0)]
Experiments in nuclear, atomic, and condensed matter physics, such as gamma-ray and X-ray spectroscopies, betas and alpha particle 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 or PHYS 7140
Term Offered: Spring

PHYS 7220 Classical Mechanics
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 or PHYS 7250
Term Offered: Fall

PHYS 7280 Photovoltaic Materials And Device Physics Laboratory
[3 credit hours (0, 3, 0)]
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 and PHYS 7140
Term Offered: Fall

PHYS 7320 Quantum Mechanics I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 7520 Condensed Matter Physics I
[3 credit hours (3, 0, 0)]
A study of the electromagnetic, thermal and elastic properties of condensed matter through the quantum-mechanical treatment of the electrons and elementary excitations.
Prerequisites: PHYS 6330

PHYS 7530 Condensed Matter Physics II
[3 credit hours (3, 0, 0)]
A survey of condensed matter phenomena of interest to experimentalists, as elucidated by theory.
Prerequisites: PHYS 6330

PHYS 7710 Atomic Physics
[3 credit hours (3, 0, 0)]
A study of the fundamental properties of atoms, their theoretical description and experimental measurement. Topics include atomic structure, radiative transitions, external field interactions and atomic collisions.
Term Offered: Fall

PHYS 7720 Atomic & Molecular Spectroscopy
[3 credit hours (3, 0, 0)]
Theory and experimental methods of atomic and molecular spectroscopy. Topics include the theory of interpretation of atomic and molecular spectra and the experimental means to measure the spectra.
Prerequisites: PHYS 6710

PHYS 7810 Stellar Astrophysics I
[3 credit hours (3, 0, 0)]
Term Offered: Fall

PHYS 7820 Stellar Astrophysics II
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
Structure and dynamics of the Galaxy, shocks and explosions, stellar kinematics, galactic rotation, and dynamical and chemical evolution.
PHYS 8860 General Relativity  
[3 credit hours (3, 0, 0)]  
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  
**Term Offered:** Fall

PHYS 8870 Cosmology  
[3 credit hours (3, 0, 0)]  
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  
**Term Offered:** Spring

PHYS 8960 Ph. D. Thesis Research  
[1-15 credit hours (0, 0, 0)]  
Thesis research required for the Ph.D. degree.  
**Term Offered:** Spring, Summer, Fall

PHYS 8980 Special Topics  
[1-4 credit hours (0-4, 0, 0)]  
Course reserved for visiting lecturers and topics not covered otherwise.  
**Term Offered:** Spring, Summer

PHYS 8990 Independent Study  
[1-4 credit hours (0, 0, 0)]
PHYSIOLOGY (PHSL)

PHSL 5050 Human Physiology
[3 credit hours (3, 0, 0)]
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 Interest Groups In American Politics
[3 credit hours (0, 0, 3)]
This course investigates the role of interest groups in American politics. Topics include lobbying, candidate recruitment, PAC’s and agenda setting.
Term Offered: Spring, Fall

PSC 5230 Presidency
[3 credit hours (0, 0, 3)]
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 (3, 0, 0)]
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 (0, 0, 3)]
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.
Term Offered: Summer, Fall

PSC 5320 Urban Policy & Administration
[3 credit hours (3, 0, 0)]
An examination of the policy process in modern cities, focusing on the interactions between the principal political and administrative organizations in formulating and implementing policy.
Term Offered: Fall

PSC 5340 Environmental Policy And Administration
[3 credit hours (3, 0, 0)]
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: Spring, Fall

PSC 5390 Applied Politics Internship
[3 credit hours (0, 0, 3)]
A study of electoral politics, public decision-making or policy implementation through internships with candidates, political parties, public officials or governmental or nonprofit agencies.
Term Offered: Spring, Summer, Fall

PSC 5530 Civil Rights
[3 credit hours (3, 0, 0)]
A study of policy-making and implementation related to issues of race, gender and sexual orientation.
Term Offered: Summer, Fall

PSC 5550 Contemporary Issues In Law and Politics
[3 credit hours (3, 0, 0)]
Examines current controversies in U.S. law and politics, drawing on recent research in political theory, constitutional history, and legal doctrine. Includes issues such as freedom of speech, presidential powers, and religious freedom.
Term Offered: Spring

PSC 5580 International Law
[3 credit hours (3, 0, 0)]
A study of the legal system governing interstate relations. Cases will be reviewed. State jurisdiction and responsibilities will be examined, emphasizing the rules of war.

PSC 5590 Law, Policy,And The Politics of Sexuality
[3 credit hours (0, 0, 3)]
This course explores law, policymaking, and public attitudes that affect gay, lesbian, bisexual and transgendered individuals in the U.S. Topics include hate crimes legislation, discrimination law, and same-sex marriage.
Term Offered: Spring, Fall

PSC 5640 The European Union
[3 credit hours (3, 0, 0)]
An analysis of the evolution, institutional structure and operation of the European Unions.
Term Offered: Spring

PSC 5650 International Political Economy
[3 credit hours (0, 0, 3)]
An analysis of the interaction of the international political and economic systems with focus on the political aspects of the international economy. Topics include economic development, interdependence, trade and multilateral institutions.

PSC 5660 Politics of Latin America
[3 credit hours (0, 0, 3)]
This course provides a survey of the Latin American region, its political transformation, and place in international politics. It covers an array of issues that have shaped and continue to shape the region: its history, its people, institutions and politics, and social and economic issues. Themes are approached both from a regional and country-level perspective.

PSC 5710 Theories Of International Politics
[3 credit hours (3, 0, 0)]
An analysis of the leading approaches to the study of international politics that contribute to the construction of a general theory.

PSC 5720 International Organizations
[3 credit hours (3, 0, 0)]
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 5740 International Relations - Middle East
[3 credit hours (3, 0, 0)]
A survey of geopolitical, economic and sociocultural factors affecting foreign policy processes; an examination of the role of the Big Powers and the United Nations. Conferences with the instructor are required.
PSC 5750 Terrorism in International Relations  
[3 credit hours (0, 0, 3)]
This course will give students a comparative historical, empirical, and theoretical overview of the causes, strategies, and goals of terrorists and counter-terrorism. The primary focus of the course is on the comparative and international nature of terrorism. Global and regional case studies will be used to better understand issues related to terrorism.

PSC 5950 Mpa Research Report  
[2 credit hours (0, 0, 2)]
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 (3, 0, 0)]
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 (0, 0, 1)]
Individual study in selected topic.  
**Term Offered:** Spring, Summer, Fall

PSC 6940 Public Service Internship  
[1-6 credit hours (0, 0, 0-1)]
Internship in public or nonprofit agency and preparation of an internship paper analyzing the internship experience.  
**Term Offered:** Spring, Summer, Fall

PSC 6960 Thesis Seminar  
[1-6 credit hours (0, 0, 0-1)]
Supervision of master’s thesis writing.  
**Term Offered:** Spring, Summer, Fall
PSYCHOLOGY (PSY)

PSY 6000 History Of Psychology
[3 credit hours (3, 0, 0)]
Intensive historical treatment of the development of modern psychology from the 19th century. Theoretical psychological and related philosophical positions are emphasized.

PSY 6030 Research Practicum
[1-3 credit hours (0, 0, 0-3)]
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 (0, 0, 3)]
Supervised experience in the teaching of psychology. May be repeated for credit.
Term Offered: Fall

PSY 6050 Culture And Psychology
[3 credit hours (3, 0, 0)]
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 6100 Quantitative Methods In Psychology I
[3 credit hours (3, 0, 0)]
Probability theory, descriptive and inferential statistics, hypothesis testing, correlation.
Term Offered: Fall

PSY 6110 Quantitative Methods In Psychology II
[3 credit hours (3, 0, 0)]
Analysis of variance, regression analyses, non-parametric analyses.
Term Offered: Spring

PSY 6130 Design And Evaluation Of Psychological Research
[3 credit hours (3, 0, 0)]
Readings and discussion of problems of research design and analysis.
Term Offered: Fall

PSY 6150 Psychometrics and Scale Development
[3 credit hours (3, 0, 0)]
Procedures for developing and examining the reliability and validity of test scales, including theories of measurement, item analysis, factor analysis, and diagnostic efficiency statistics.
Prerequisites: PSY 6100 and PSY 6110
Term Offered: Spring

PSY 6200 Systems Of Personality
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Critical analysis of diagnostic classification models, etiological conceptualizations and therapeutic interventions for mental disorders.
Term Offered: Fall

PSY 6220 Cognitive Assessment
[4 credit hours (4, 0, 0)]
Assessment of cognitive functioning, utilizing tests of cognitive abilities and achievement.
Term Offered: Spring, Fall

PSY 6230 Personality Assessment
[4 credit hours (4, 0, 0)]
Assessment of personality functioning utilizing objective tests.
Prerequisites: PSY 6220
Term Offered: Spring

PSY 6250 Seminar In Clinical Psychology
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 6300 Cognitive-Behavioral Psychotherapy
[3 credit hours (3, 0, 0)]
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 6320 Professional And Marital Therapy
[3 credit hours (3, 0, 0)]
Presentation and exploration of family and couple therapy as a discipline, theoretical perspectives and empirical research on couple/family interaction and therapeutic techniques used with families and couples.
Prerequisites: PSY 6390
Term Offered: Fall
PSY 6390 Clinical Laboratory
[3 credit hours (0, 0, 3)]
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 (3, 0, 0)]
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 (3, 0, 0)]
An advanced seminar focusing on selected topics from the general area of Cognitive Psychology.
Term Offered: Spring

PSY 6500 Developmental Psychology
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Readings and evaluative discussions of the primary research literature in developmental psychology.
Prerequisites: PSY 6500
Term Offered: Spring, Fall

PSY 6600 Behavioral Neuroscience
[3 credit hours (3, 0, 0)]
Structure and function of neurons and the neural mediation of behavior, both normal and abnormal.
Term Offered: Summer

PSY 6610 Seminar In Psychobiology And Learning
[3 credit hours (3, 0, 0)]
Readings and evaluative discussions of the primary research literature in psychobiology, behavioral neuroscience, neuroanatomy, learning, motivation and perception.
Term Offered: Fall

PSY 6700 Social Psychology
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
In-depth treatment of selected topics in Social Psychology.
Term Offered: Spring, Fall

PSY 6810 Clinical Practicum I
[0 credit hours (0, 0, 0)]
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.
Prerequisites: PSY 6390
Term Offered: Spring, Fall

PSY 6820 Clinical Practicum II
[3 credit hours (0, 0, 3)]
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 6390

PSY 6830 Clinical Practicum III
[3 credit hours (0, 0, 3)]
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 6390 and PSY 6810 and PSY 6820
Term Offered: Spring, Fall

PSY 6840 Clinical Practicum IV
[1-3 credit hours (0, 0, 1-3)]
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 6390 and PSY 6810 and PSY 6820 and PSY 6830
Term Offered: Spring, Fall

PSY 6850 Family And Couple Practicum
[3 credit hours (0, 0, 3)]
Supervision of psychotherapy with families and couples seen through the University of Toledo Psychology Clinic.
Term Offered: Spring, Fall

PSY 6860 Advanced Assessment Practicum
[3 credit hours (3, 0, 0)]
Clinical supervision of psychological assessments using multiple methods of assessment with clients seen through the University of Toledo Psychology Clinic.
Prerequisites: PSY 6210 and PSY 6220 and PSY 6230
Term Offered: Spring, Fall

PSY 6930 Seminar In Psychology
[3 credit hours (3, 0, 0)]
Readings and evaluative discussions of the primary research literature in psychology.
Term Offered: Spring, Fall

PSY 6940 Supervised Clinical Practicum
[1-3 credit hours (0, 0, 0-3)]
Supervised applied assessment, therapeutic and consultative experience in community settings.
Term Offered: Summer, Fall
PSY 6950 Community Placement in Clinical Psychology
[0 credit hours (0, 0, 0)]
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 (0-3, 0, 0)]
Developing, conducting and analyzing the thesis research project, writing the thesis.
Term Offered: Spring, Summer, Fall

PSY 6980 Special Topics
[1-3 credit hours (0-3, 0, 0)]
Professional issues in academic and scientific psychology.
Term Offered: Spring, Summer, Fall

PSY 6990 Independent Study
[1-15 credit hours (0, 0, 0-15)]
Directed reading and/or experimentation on a topic selected by the study in conjunction with a faculty mentor.
Term Offered: Spring, Summer, Fall

PSY 7000 History Of Psychology
[3 credit hours (3, 0, 0)]
Intensive historical treatment of the development of modern psychology from the 19th century. Theoretical psychological and related philosophical positions are emphasized.

PSY 7030 Research Practicum
[1-3 credit hours (0, 0, 0-3)]
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 (0, 0, 3)]
Supervised experience in the teaching of psychology. May be repeated for credit.
Term Offered: Fall

PSY 7050 Culture And Psychology
[3 credit hours (3, 0, 0)]
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 7100 Quantitative Methods In Psychology I
[3 credit hours (3, 0, 0)]
Probability theory, descriptive and inferential statistics, hypothesis testing, correlation.
Term Offered: Fall

PSY 7110 Quantitative Methods In Psychology II
[3 credit hours (3, 0, 0)]
Analysis of variance, regression analyses, non-parametric analyses.
Term Offered: Spring

PSY 7130 Design And Evaluation Of Psychological Research
[3 credit hours (3, 0, 0)]
Readings and discussion of problems of research design and analysis.
Term Offered: Fall

PSY 7150 Psychometrics and Scale Development
[3 credit hours (3, 0, 0)]
 Procedures for developing and examining the reliability and validity of test scales, including theories of measurement, item analysis, factor analysis, and diagnostic efficiency statistics.
Prerequisites: PSY 7100 and PSY 7110

PSY 7200 Systems Of Personality
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Critical analysis of diagnostic classification models, etiological conceptualizations and therapeutic interventions form mental disorders.
Term Offered: Fall

PSY 7220 Cognitive Assessment
[4 credit hours (4, 0, 0)]
Assessment of cognitive functioning, utilizing tests of cognitive abilities and achievement.
Term Offered: Spring, Fall

PSY 7230 Personality Assessment
[4 credit hours (4, 0, 0)]
Assessment of personality functioning utilizing objective tests.
Prerequisites: PSY 6220 or PSY 7220
Term Offered: Spring

PSY 7250 Seminar In Clinical Psychology
[3 credit hours (3, 0, 0)]
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: Summer, Fall

PSY 7260 Professional And Ethical Issues
[3 credit hours (3, 0, 0)]
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 7310 Psychotherapy With Children And Adolescents
[3 credit hours (3, 0, 0)]
Presentation and explanation of techniques of psychotherapy with children and adolescents.
Prerequisites: PSY 6390
Term Offered: Fall
PSY 7330 Psychodynamic Psychotherapy
[3 credit hours (3, 0, 0)]
Didactic course covering psychoanalytic/psychodynamic theories, case conceptualization, therapy techniques, and relevant empirical research.
Prerequisites: PSY 7390
Term Offered: Spring, Fall

PSY 7340 Cognitive-Behavioral Psychotherapy
[3 credit hours (3, 0, 0)]
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 7350 Family And Couple Therapy
[3 credit hours (3, 0, 0)]
Presentation and exploration of family and couple therapy as a discipline, theoretical perspectives and empirical research on couple/family interaction and therapeutic techniques used with families and couples.
Prerequisites: PSY 6390
Term Offered: Fall

PSY 7390 Clinical Laboratory
[3 credit hours (0, 0, 3)]
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 (3, 0, 0)]
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

PSY 7410 Seminar In Cognitive Psychology
[3 credit hours (3, 0, 0)]
An advanced seminar focusing on selected topics from the general area of Cognitive Psychology.
Term Offered: Spring

PSY 7500 Developmental Psychology
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Readings and evaluative discussions of the primary research literature in developmental psychology.
Prerequisites: PSY 6500
Term Offered: Spring, Fall

PSY 7600 Behavioral Neuroscience
[3 credit hours (3, 0, 0)]
Structure and function of neurons and the neural mediation of behavior, both normal and abnormal.
Term Offered: Summer

PSY 7610 Seminar In Psychobiology And Learning
[3 credit hours (3, 0, 0)]
Readings and evaluative discussions of the primary research literature in psychobiology, behavioral neuroscience, neuroanatomy, learning, motivation and perception.
Term Offered: Fall

PSY 7700 Social Psychology
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
In depth treatment of selected topics in Social Psychology.
Term Offered: Spring, Fall

PSY 7810 Clinical Practicum I
[0 credit hours (0, 0, 0)]
Supervision of psychotherapy with children and adolescents seen through the The University of Toledo Psychology Clinic.
Prerequisites: PSY 6390
Term Offered: Spring, Fall

PSY 7820 Clinical Practicum II
[3 credit hours (0, 0, 3)]
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 6390

PSY 7830 Clinical Practicum III
[3 credit hours (0, 0, 3)]
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 6390 and PSY 6810 and PSY 7810 and PSY 6820 and PSY 7820

PSY 7840 Clinical Practicum IV
[1-3 credit hours (0, 0, 1-3)]
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 6390 and PSY 6810 and PSY 7810 and PSY 6820 and PSY 7820 and PSY 6830 and PSY 7830
Term Offered: Spring, Fall

PSY 7850 Family And Couple Practicum
[3 credit hours (0, 0, 3)]
Supervision of psychotherapy with families and couples seen through The University of Toledo Psychology Clinic.
Term Offered: Spring, Fall
PSY 7860 Advanced Assessment Practicum
[3 credit hours (3, 0, 0)]
Clinical supervision of psychological assessments using multiple method of assessment with clients seen through The University of Toledo Psychology Clinic.
Prerequisites: PSY 7210 and PSY 7220 and PSY 7230
Term Offered: Spring, Fall

PSY 7930 Seminar In Psychology
[3 credit hours (3, 0, 0)]
Readings and evaluative discussions of the primary research literature in psychology.
Term Offered: Spring, Fall

PSY 7940 Supervised Clinical Practicum
[1-3 credit hours (0, 0, 0-3)]
Supervised applied assessment, therapeutic and consultative experience in community settings.
Term Offered: Summer, Fall

PSY 7950 Community Placement in Clinical Psychology
[0 credit hours (0, 0, 0)]
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 (0-3, 0, 0)]
Professional issues in academic and scientific psychology.
Term Offered: Spring, Summer, Fall

PSY 7990 Independent Study
[1-15 credit hours (0, 0, 0-15)]
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 (0, 0, 0-1)]
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 (0, 0, 0-15)]
Developing, conducting and analyzing the dissertation research project; writing the dissertation.
Term Offered: Spring, Summer, Fall
PUBLIC HEALTH (PUBH)

PUBH 5020 Occupational Health
[3 credit hours (3, 0, 0)]
Hazardous materials, mathematics, anatomy, and physiology; hazard recognition for harmful agents; methods, standards, recommendations, and instruments used to evaluate hazards; techniques for hazard control; occupational health programs and regulations; communication and ethics.
Term Offered: Fall

PUBH 5060 Occupational Safety
[3 credit hours (3, 0, 0)]
Safety and health organization, administration, management, services; controlling unsafe conditions/acts relation to construction and buildings, machines, materials handling, pressure vessels, electrical equipment; emergency procedures; communication effectiveness and ethical guidelines/standards.
Term Offered: Fall

PUBH 5160 Environmental Health
[3 credit hours (3, 0, 0)]
Scientific, regulatory and management principles applicable to human disease associated with food, water, air and soil contamination. Focuses on biology and chemistry of contamination and transformation, exposure monitoring and contaminant control.
Term Offered: Spring, Fall

PUBH 5260 Haz Mat and Emerg Response
[3 credit hours (3, 0, 0)]
(terrorism) Disaster preparedness and emergency response; and, personal protective equipment and site assessment/monitoring. This course requires the student to wear personal protective equipment, perform hands on monitoring and sampling, and assess and respond to in class response scenarios.
Term Offered: Spring, Summer, Fall

PUBH 5310 Chemical Agents
[3 credit hours (3, 0, 0)]
Scientific principles and practices applicable to the qualitative and quantitative evaluation of chemical agents associated with human diseases resulting from various environmental exposures. Content includes methods to assess exposures in the workplace.
Term Offered: Spring, Fall

PUBH 5410 Hazard Control
[3 credit hours (0, 0, 0)]
Ventilation; control of indoor and outdoor (ambient) air pollution; operation of dilution and location exhaust ventilation systems; design of ventilation systems; respiratory and other personal protective equipment and programs available or commonly used in the workplace; communication and ethics.
Term Offered: Spring

PUBH 5520 Biological Agents
[3 credit hours (3, 0, 0)]
Scientific principles and practices applicable to the pathogenicity, evaluation and control of microbiological agents, parasitic agents, and some biological vectors associated with human diseases resulting from various environmental exposures. Content includes normal/abnormal human physiology relative to exposure, exposure assessment, and exposure control.
Term Offered: Summer, Fall

PUBH 5620 Physical Agents
[3 credit hours (0, 0, 0)]
Monitor exposure to physical agents; assessment of exposure to physical agents; appropriate exposure control methods of physical agents; professional reports; laws, regulations, recommendations, standards, services related to physical agents; communication and ethics.
Term Offered: Spring

PUBH 5700 Risk Assessment
[3 credit hours (3, 0, 0)]
Human health risk assessment including hazard identification, dos-response assessment, human exposure assessment, and risk characterization are discussed. Emphasis on practice of risk assessment, management, and communication relative to public, environmental, and occupational health and safety.
Term Offered: Summer, Fall

PUBH 5720 Exposure Assessment Strategies
[3 credit hours (3, 0, 0)]
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 or PUBH 600
Term Offered: Spring

PUBH 6000 Biostatistics
[3 credit hours (3, 0, 0)]
An introduction to descriptive statistics including measurement of central tendency, dispersion, relative position, correlation, and regression. Inferential statistical theory, selected nonparametric methods, application of computers, and also occupational exposure assessment will be discussed.
Term Offered: Spring, Fall

PUBH 6010 Public Health Epidemiology
[3 credit hours (3, 0, 3)]
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 (3, 0, 0)]
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, Fall
PUBH 6030 Advanced Epidemiology  
[3 credit hours (3, 0, 0)]
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: Summer

PUBH 6060 Advanced Biostatistics  
[3 credit hours (3, 3, 0)]
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 (3, 0, 0)]
Introduces genetic epidemiology methods, principles of population genetics including linkage and association studies used in assessing familial aggregation, and transmission patterns for identifying the genetic basis of common diseases.  
Prerequisites: (PUBH 6000 or PUBH 8000) and (PUBH 6010 or PUBH 8010) or (PUBH 600 or PUBH 800) and (PUBH 601 or PUBH 801)
Term Offered: Summer

PUBH 6080 Social Determinants of Health  
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 6100 Environ/Occup Epidemiology  
[3 credit hours (0, 0, 0)]
The course focuses on the application of epidemiological techniques to the study of effects of occupational and environmental exposures. Prerequisite: PUBH600 and 601.

PUBH 6110 Categorical Data Analysis  
[3 credit hours (3, 0, 0)]
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 Rausch models, multivariate methods for matched pairs and longitudinal data. The methods are illustrated with SAS and/or SPSS, R.  
Term Offered: Spring, Summer

PUBH 6120 Epidemiology Infectious Diseases  
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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

PUBH 6160 Reproductive Epidemiology  
[3 credit hours (3, 0, 0)]
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 or PUBH 601
Term Offered: Spring

PUBH 6170 Molecular and Genomic Epidemiology  
[3 credit hours (3, 0, 0)]
Presents concepts and methods of molecular and genetic epidemiology relevant to the study of prevalent diseases in the population. Topics include biomarkers, polymorphism and gene-environment interaction. The evolution and function of the genomics and a synopsis of epidemiological design and analysis are included.

PUBH 6180 Cancer Epidemiology  
[3 credit hours (0, 0, 0)]
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 (3, 0, 0)]
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 or PUBH 8000
Term Offered: Fall

PUBH 6200 Methods, Materials for Public Health  
[3 credit hours (0, 0, 0)]
Introduces students to resource materials and methods appropriate for public health education. Students will use various mediums of instruction in direct application to public health programs.  
Term Offered: Spring, Fall

PUBH 6250 Nutritional Epidemiology  
[3 credit hours (0, 0, 0)]
PUBH 6300 Community Health Organization
[3 credit hours (0, 0, 0)]
Focuses on techniques to bring about change in a community's health status through assessment, public advocacy, coalition building, decision-making, planning, policy development, and political influence. Applications will be emphasized.
Term Offered: Spring

PUBH 6330 Public Health and Aging
[3 credit hours (0, 0, 0)]
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

PUBH 6410 Global Perspectives on Public Health and Disaster Preparedness
[3 credit hours (2, 1, 0)]
This course introduces the introductory healthcare learner (including but not limited to MD, MPH, PA, MSN, MSBS, OT, PT) to specific principles of global perspectives on disaster management and response. Covers epidemiology of various diseases and population health issues from a global and domestic perspective. Employs an all-hazards framework, providing essential skills to function in the event of a catastrophe. Guest speakers from healthcare disciplines who work internationally will present first-hand experiences in managing disasters.
Term Offered: Spring

PUBH 6420 Social Marketing in Health
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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: Summer

PUBH 6460 Health Promotion Programs
[3 credit hours (3, 0, 0)]

PUBH 6500 Disaster Preparedness/Response
[3 credit hours (3, 0, 0)]
PUBH 6510 Issues in Pandemic Preparedness and Response
[3 credit hours (2, 1, 0)]
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

PUBH 6520 Public Health Nutrition
[3 credit hours (0, 0, 0)]

PUBH 6550 Chronic Disease Epidemiology
[3 credit hours (3, 0, 3)]
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 or PUBH 601
Term Offered: Spring, Summer, Fall

PUBH 6560 Interdisciplinary Crisis Management for Medical and Public Health Professionals
[3 credit hours (3, 0, 0)]
The purpose of this semester course is to introduce the interdisciplinary healthcare learner (including but not limited to MD, PA, MPH, MSN, OT and PT students) to specific principles of epidemiology and disaster medicine employing an all-hazards framework and to provide essential skills enabling proper functioning in the event a catastrophe arises in the near future. The course will include lectures, simulation exercises and independent web-assisted content.
Term Offered: Spring, Fall

PUBH 6600 Health Behavior
[3 credit hours (0, 0, 0)]
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 (3, 0, 0)]
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: Fall

PUBH 6630 Public Health Advocacy
[3 credit hours (3, 0, 0)]
An examination of the importance of advocacy for the individual, community, and public health professionals. Special emphasis will be placed on developing advocacy-based skills to effectively advocate at the micro and macro level. In addition, students will participate in advocacy efforts external to the university to gain experience that enriches the student's training.
Term Offered: Spring
PUBH 6730 Research Environmental Health
[3 credit hours (0, 0, 3)]
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 Indep Study in Biostatistics
[0-3 credit hours (0, 0, 0)]
This course addresses areas of biostatistics not covered by a regular course offering. It is intended to provide students the knowledge and experience needed in that area. This course is designed for public health students and could be beneficial to Ph.D. students, specifically those who need advanced statistical techniques for their dissertation. Topics include survival analysis, statistical models in carcinogenesis, statistical genetics, nonparametric statistics and multivariate techniques. May be repeated for credit.
Term Offered: Spring, Summer, Fall

PUBH 6800 Evaluation of Health Programs
[3 credit hours (3, 0, 0)]
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 (UT-Main). Prerequisites: HEAL 6460/HEAL 8460; co-requisite: HEAL 6750.
Term Offered: Spring, Fall

PUBH 6890 Indep Study in Public Health
[1-3 credit hours (0, 0, 0)]
The student and instructor will agree on a program of study that will enable the student to achieve specific learning objectives in environmental health. May be repeated for credit.
Term Offered: Spring, Summer, Fall

PUBH 6950 Integrative Learning Experience
[2 credit hours (0, 0, 2)]
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 6960 Internship in Public Health
[1-4 credit hours (0, 0, 1-4)]
Comprehensive or focused practical training in environmental and occupational health at a designated agency, organization, or company.
Term Offered: Spring, Summer, Fall

PUBH 6970 Project in Public Health
[1-4 credit hours (0, 0, 0)]
Independent development by a student with approval and guidance by a Major Advisor, of a paper, manual, software, etc. applicable to a specific area of environmental and occupational health.
Term Offered: Spring, Summer, Fall

PUBH 6980 Seminar in Public Health
[1-3 credit hours (0, 0, 0)]
A systematic study of selected topics in public health. Course meets for three consecutive semesters. Students may begin any semester, but must complete in sequence. Students register for one credit each term for a cumulative total of three consecutive semesters. May be repeated for credit.

PUBH 6990 Thesis Research
[1-4 credit hours (0, 0, 0)]

PUBH 8000 Biostatistics
[3 credit hours (3, 0, 0)]

PUBH 8010 Public Health Epidemiology
[3 credit hours (3, 0, 0)]
This course will present principles of the epidemiology method including problem solving. Various study designs will be discussed, including prospective and retrospective studies, analytical, and experimental methods.
Term Offered: Spring, Fall

PUBH 8020 Management and Leadership in Public Health
[3 credit hours (3, 0, 0)]
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, Fall

PUBH 8030 Advanced Epidemiology
[3 credit hours (3, 0, 0)]
The 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: Summer

PUBH 8060 Advanced Biostatistics
[3 credit hours (3, 0, 0)]

PUBH 8090 Issues in Public Health
[3 credit hours (3, 0, 0)]
Examination of various contemporary issues in public health. Included are 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 (3, 0, 0)]

PUBH 8120 Epidemiology Infectious Disease
[3 credit hours (3, 0, 0)]
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: Fall

PUBH 8130 Molecular Epidemiology
[3 credit hours (3, 0, 0)]
This course covers both the major theoretical and practical issues of conducting an epidemiology study involving molecular and genomic techniques. The course will emphasize from infectious disease, chronic disease, and cancer research literature.
Term Offered: Fall
PUBH 8150 Clinical Epidemiology
[3 credit hours (3, 0, 0)]
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

PUBH 8160 Reproductive Epidemiology
[3 credit hours (3, 0, 0)]
Additional assignments are here for students who will take this course as PUBH 8160. Covers broad reproductive health issues from the preconception, pre-natal, delivery, and post-natal periods and emphasizes how these issues affect women, men, babies, and infants. Relevant methodological and programmatic issues will be presented with practical illustrations from domestic and international settings. Guest speakers, including health care providers, will give real world experience and insight to these topics of study.
Prerequisites: PUBH 6010 and PUBH 8010
Term Offered: Spring

PUBH 8170 Molecular and Genomic Epidemiology
[3 credit hours (3, 0, 0)]
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: Summer, Fall

PUBH 8180 Cancer Epidemiology
[3 credit hours (0, 0, 0)]
Prepares students to study the data, analysis, and interpretation of 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: Summer

PUBH 8330 Public Health and Aging
[3 credit hours (0, 0, 3)]
Examines public health and aging issues in contemporary society. Introduces physical, cognitive, and affective function from a public health perspective. Prevention and health promotion are included.
Term Offered: Summer

PUBH 8410 Global Perspectives on Public Health and Disaster Preparedness
[3 credit hours (2, 1, 0)]
This course introduces the introductory healthcare learner (including but not limited to MD, MPH, PA, MSN, MSBS, OT, PT) to specific principles of global perspectives on disaster management and response. Covers epidemiology of various diseases and population health issues from a global and domestic perspective. Employs an all-hazards framework, providing essential skills to function in the event of a catastrophe. Guest speakers from healthcare disciplines who work internationally will present first-hand experiences in managing disasters.
Term Offered: Spring

PUBH 8420 Social Marketing in Health
[3 credit hours (3, 0, 0)]
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 Ps” 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 8430 Community Mental Health
[3 credit hours (3, 0, 0)]
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: Summer

PUBH 8500 Disaster Preparedness/Response
[3 credit hours (3, 0, 0)]
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

PUBH 8510 Issues in Pandemic Preparedness and Response
[3 credit hours (2, 1, 0)]
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 or PUBH 601
Term Offered: Summer

PUBH 8550 Chronic Disease Epidemiology
[3 credit hours (3, 0, 3)]
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: Summer

PUBH 8560 Interdisciplinary Crisis Management for Medical and Public Health Professionals
[3 credit hours (3, 0, 0)]
The purpose of this semester course is to introduce the interdisciplinary healthcare learner (including but not limited to MD, PA, MPH, MSN, OT and PT students) to specific principles of epidemiology and disaster medicine employing an all-hazards framework and to provide essential skills enabling proper functioning in the event a catastrophe arises in the near future. The course will include lectures, simulation exercises and independent web-assisted content.
Term Offered: Spring, Fall
PUBH 8620 Introduction to Health Policy and Health Systems  
[3 credit hours (3, 0, 0)]  
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:** Fall

PUBH 8630 Public Health Advocacy  
[3 credit hours (3, 0, 0)]  
An examination of the importance of advocacy for the individual, community, and public health professionals. Special emphasis will be placed on developing advocacy-based skills to effectively advocate at the micro and macro level. In addition, students will participate in advocacy efforts external to the university to gain experience that enriches the student's training.  
**Term Offered:** Spring
RECREATION AND RECREATION THERAPY (RCRT)

RCRT 5100 Community Event Planning
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the event planning process including: risk and risk management, ethics, inclusivity, planning, budgeting, organizing, location selection, travel logistics, venue and guest requirements, marketing, and food and beverage considerations.
Term Offered: Summer, Fall

RCRT 5200 Planning and Promotion of Sport
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the principles of marketing and delivery of services associated with intercollegiate athletics, professional, and multi-sport club operations, facilities and management of resources. This course also examines motivation and behavior of sports tourists.
Term Offered: Fall

RCRT 5300 Recreation And Adaptation For Special Education
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the principals of inclusion and major legislation that impacts the provision and delivery of recreational services for individuals with disabilities.
Term Offered: Spring, Fall

RCRT 5310 Leisure And Popular Culture
[3 credit hours (3, 0, 0)]
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: Fall

RCRT 5320 Administration In Recreation And Recreational Therapy
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the administrative functions of delivering recreation and therapeutic recreation services. Students will master and apply the aspects of management principles including ethics, legislation, technology, quality management, risk management, financial and human resources, marketing, and accreditation.
Term Offered: Spring

RCRT 5340 Leisure, Recreation And Aging
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the impacts of aging on leisure and recreation behavior and activity 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.
Term Offered: Spring, Fall

RCRT 5410 Facility Planning and Design
[3 credit hours (3, 0, 0)]
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 Leisure Program Research Techniques
[3 credit hours (3, 0, 0)]
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: Spring, Fall

RCRT 5610 Adventure Programming in Recreation and Recreation Therapy
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of, and ability to apply, theories and techniques of adventure programming as a treatment protocol and/or leisure education tool. Outdoor trips required.
Term Offered: Spring, Fall

RCRT 5620 Animal Assisted Therapy
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using a variety of animal-assisted modalities.
Term Offered: Spring, Fall

RCRT 5630 Therapeutic Activities
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using a variety of games, humor and play modalities.
Term Offered: Spring, Fall

RCRT 5640 Rt Intervention: Therapeutic Groups
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using therapeutic group techniques and processes as a modality.
Term Offered: Spring, Fall

RCRT 5660 Relaxation And Stress Management
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using relaxation and stress management techniques as a modality.
Prerequisites: (RCRT 1310 and RCRT 4720)
Term Offered: Spring, Fall
RCRT 5760 Rt Intervention: Leisure Education
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using leisure education activities, including: social skills, values clarification, leisure awareness, resources and knowledge. Minimum
Term Offered: Spring, Fall

RCRT 5690 Rt Intervention: Aquatic Therapy
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes utilizing swimming, evidence-based aquatic programming methods, and resources.
Term Offered: Spring, Summer, Fall

RCRT 5720 Introduction To Therapeutic Recreation
[3 credit hours (3, 0, 0)]
This course is designed to introduce graduate students who do not have a background in therapeutic recreation to the 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.
Term Offered: Spring, Fall

RCRT 5730 Medical & Clinical Aspects Of Therapeutic Recreation
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of health-related conditions or disabilities related to physical, neurological, sensory and metabolic impairments across the lifespan. Uses of pharmacological interventions, family involvement, programming, and other implications impacting Therapeutic Recreation practice are examined.
Term Offered: Fall

RCRT 5750 Group Dynamics In Recreational Therapy
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
This course addresses the procedures and processes of assessment, planning, implementation and evaluation of recreation therapy services.

RCRT 5790 Medical & Clinical Aspects Of Therapeutic Recreation II
[3 credit hours (3, 0, 0)]
This course provides the graduate student with an advanced understanding of health-related conditions or disabilities related to intellectual and developmental disabilities and psychological impairments across the lifespan. Uses of pharmacological interventions, family involvement, programming, and other implications impacting Therapeutic Recreation practice will be examined.
Term Offered: Spring

RCRT 5800 Clinical: Physical Rehabilitation
[1 credit hour (0.5, 0, 4)]
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 Clinical: Psychiatric Rehabilitation
[1 credit hour (0.5, 0, 4)]
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 psychiatric rehabilitation population.
Term Offered: Spring, Fall

RCRT 5820 Clinical: Mental Retardation/Developmental Disability
[1 credit hour (0.5, 0, 4)]
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 an ID/DD rehabilitation population.
Term Offered: Spring, Fall

RCRT 5830 Clinical: Geriatric
[1 credit hour (0.5, 0, 4)]
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, Fall

RCRT 5860 Therapeutic Fitness
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using therapeutic fitness modalities.
Term Offered: Spring, Fall

RCRT 5870 Program Planning In Recreational Therapy
[3 credit hours (3, 0, 0)]
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 5900 Rt Intervention: Craft Therapy
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using craft therapy modalities.
Term Offered: Spring, Fall
RCRT 5910 Rt Intervention: Horticulture Therapy
[1 credit hour (0, 1, 0)]
This course provides the graduate student with advanced skill development needed to implement therapeutic outcomes using horticulture therapy modalities.
Term Offered: Spring, Fall

RCRT 5940 Internship In Recreation And Leisure
[1-6 credit hours (0, 0, 0-18)]
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 (3, 0, 0)]
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 (3, 0, 0)]
This course provides the graduate student with an advanced understanding of the financial management concepts and resources supporting the delivery of recreation and recreation therapy services.
Term Offered: Summer

RCRT 6920 Master's Project In Recreation And Leisure
[1-4 credit hours (0, 0, 0-4)]
This course provides the graduate student with the opportunity to complete a Master's project under the supervision of a project committee in partial fulfillment for the MA degree in recreation and leisure studies.
Term Offered: Spring, Summer, Fall

RCRT 6940 Internship
[1-4 credit hours (0, 0, 0-12)]
This course provides the graduate student with the opportunity to complete an advanced internship under the supervision of a recreation professional in partial fulfillment for the MA degree in recreation and leisure studies.
Term Offered: Spring, Fall

RCRT 6960 Master's Thesis In Recreation And Leisure
[1-4 credit hours (0, 0, 0-4)]
This course provides the graduate student with the opportunity to complete a Master's Thesis under the supervision of a thesis committee 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 (0, 0, 0-3)]
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
RELIGION (REL)

REL 5930 Seminar In Religion
[3 credit hours (0, 0, 3)]
Advanced academic study of a thinker or topic in religion.
RESEARCH AND MEASUREMENT (RESM)

RESM 5110 Quantitative Methods I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 5220 Applied Assessment for Improved Practice
[3 credit hours (0, 0, 3)]
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 or RESM 5210
Term Offered: Summer

RESM 5310 Educational Research
[3 credit hours (0, 0, 0)]
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 (3, 0, 0)]
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 5950 Workshop In Research And Measurement
[3 credit hours (0, 0, 3)]
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 or RESM 5110
Term Offered: Spring, Summer

RESM 6120 Quantitative Methods II
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Summer, Fall

RESM 6130 Multivariate Statistics
[3 credit hours (3, 0, 0)]
This course covers multivariate analysis of variance, canonical correlation, discriminant analysis, repeated measures and factor analysis. Computer applications are included.
Prerequisites: RESM 6120 or RESM 8120
Term Offered: Fall

RESM 6140 Advanced Quantitative Methods
[3 credit hours (3, 0, 0)]
This course exposes students to various experimental designs, such as complete and fractional factorial designs, repeated measures designs, and nested designs. Both the conceptual rationale and the computational procedures are covered.
Prerequisites: RESM 6120 or RESM 8120

RESM 6150 Structural Equation Modeling
[3 credit hours (3, 0, 0)]
This course introduces structural equation modeling as a statistical method to assess the strengths of a priori relations among variables. Topics include path analysis and confirmatory factor analysis. Computer applications with AMOS are included.
Prerequisites: RESM 6120 or RESM 8120
Term Offered: Spring

RESM 6160 Nonparametric Statistics
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Fall

RESM 6220 Measurement I
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Fall

RESM 6230 Measurement II
[3 credit hours (3, 0, 0)]
This course covers advanced measurement-related topics with a focus on IRT with emphasis on 1-2- and 3-parameter logistic models, Generalizability, test equating, scaling, item/test bias detection methods and current issues.
Prerequisites: (RESM 6220 or RESM 8220) and RESM 5110
RESM 6320 Research Design
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Summer, Fall

RESM 6340 Quantitative Research II: Design And Analysis
[3 credit hours (3, 0, 0)]
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 or RESM 7330
Term Offered: Spring, Summer, Fall

RESM 6330 Fundamentals Of Grant Writing
[3 credit hours (3, 0, 0)]
This course contextualizes survey development within a broad theoretical framework and proceeds through the literature, problem, purpose, methods, and sampling. Particular emphasis is placed on the validity implications of each.
Prerequisites: RESM 6120
Term Offered: Fall

RESM 6360 Program Evaluation
[3 credit hours (3, 0, 0)]
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 or RESM 7110
Term Offered: Spring, Summer, Fall

RESM 6370 Fundamentals Of Grant Writing
[3 credit hours (3, 0, 0)]
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: Summer

RESM 6940 Internships In Measurement, Evaluation, Research & Statistics
[3 credit hours (0, 0, 8)]
This is a supervised field experience in measurement, evaluation, research design, or statistics in a variety of settings.
Term Offered: Spring, Fall

RESM 6960 Master’s Thesis In Educational Research
[1-3 credit hours (0, 0, 0-3)]
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 6980 Master’s Project In Educational Research
[1-3 credit hours (0, 0, 0-3)]
This is a formal independent project applying principles of research and/or measurement to solve a particular problem and culminating in a written discourse.

RESM 6990 Master's Independent Study In Educational Research
[1-3 credit hours (0, 0, 0-3)]
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 (3, 0, 0)]
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 (3, 0, 0)]
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 (0, 0, 3)]
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 or RESM 5210 or RESM 7210
Term Offered: Summer

RESM 7310 Educational Research
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 7950 Workshop In Research And Measurement
[3 credit hours (0, 0, 3)]
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 or RESM 5110
Term Offered: Summer
RESM 7980 Special Topics In Research, Measurement, Statistics And Evaluation
[3 credit hours (0, 0, 3)]
The study of a current topic or set of related topics in educational research, measurement, statistics, program evaluation and computer applications in quantitative and qualitative data analysis. The course is typically taught as a seminar.
Prerequisites: RESM 4100 or RESM 5110
Term Offered: Spring, Summer

RESM 8120 Quantitative Methods II
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Summer, Fall

RESM 8130 Multivariate Statistics
[3 credit hours (3, 0, 0)]
This course covers multivariate analysis of variance, canonical correlation, discriminant analysis, repeated measures and factor analysis. Computer applications are included.
Prerequisites: RESM 6120 or RESM 8120
Term Offered: Fall

RESM 8140 Advanced Quantitative Methods
[3 credit hours (3, 0, 0)]
This course exposes students to various experimental designs, such as complete and fractional factorial designs, repeated measures designs, and nested designs. Both the conceptual rationale and the computational procedures are covered.
Prerequisites: RESM 6120 or RESM 8120

RESM 8150 Structural Equation Modeling
[3 credit hours (3, 0, 0)]
This course introduces structural equation modeling as a statistical method to assess the strengths of a priori relations among variables. Topics include path analysis and confirmatory factor analysis. Computer applications with AMOS are included.
Prerequisites: (RESM 6120 or RESM 8120) and RESM 5110
Term Offered: Spring

RESM 8160 Nonparametric Statistics
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Fall

RESM 8180 Interdisciplinary Seminar In Educational Psychology, Research, And Social Foundations
[1 credit hour (0, 0, 1)]
This seminar will enable doctoral students to improve their understanding of the research process. Students will learn to ask research questions, choose alternative methodologies and interpret the validity of conclusions.

RESM 8220 Measurement I
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Fall

RESM 8230 Measurement II
[3 credit hours (3, 0, 0)]
This course covers advanced measurement-related topics with a focus on IRT with emphasis on 1-2- and 3-parameter logistic models, Generalizability, test equating, scaling, item/test bias detection methods and current issues.
Prerequisites: (RESM 6220 or RESM 8220) and RESM 5110

RESM 8320 Research Design
[3 credit hours (3, 0, 0)]
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 or RESM 5110
Term Offered: Spring, Summer, Fall

RESM 8340 Qualitative Research II: Design And Analysis
[3 credit hours (3, 0, 0)]
This course contextualizes survey development within a broad theoretical framework and proceeds through the literature, problem, purpose, methods, and sampling. Particular emphasis is placed on the validity implications of each.
Prerequisites: RESM 8120
Term Offered: Fall

RESM 8350 Methods Of Survey Research
[3 credit hours (3, 0, 0)]
This course contextualizes survey development within a broad theoretical framework and proceeds through the literature, problem, purpose, methods, and sampling. Particular emphasis is placed on the validity implications of each.
Prerequisites: RESM 5330 or RESM 7330
Term Offered: Spring, Fall

RESM 8360 Program Evaluation
[3 credit hours (3, 0, 0)]
An overview of prominent human services program evaluation methods including objectives-based, experimental, statistical and economic approaches. Evaluation criteria, issues, ethics and politics are included.
Prerequisites: RESM 4100 or RESM 5110
Term Offered: Spring, Fall

RESM 8370 Fundamentals Of Grant Writing
[3 credit hours (3, 0, 0)]
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: Summer
RESM 8380 Methods of Normative Theory Construction  
[3 credit hours (0, 0, 3)]  
This course explores prominent methods and approaches to normative theory construction. The two approaches covered deontological and teleological.  
**Term Offered:** Spring, Fall

RESM 8390 Methods of Conceptual Analysis and Textual Interpretation  
[3 credit hours (0, 0, 3)]  
This course explores prominent methods and approaches Central Analysis and Textual Interpretation. The central goal of the course is to equip doctoral students to engage in theoretical research, the understanding and skill necessary to engage in theoretical research.

RESM 8940 Internships In Measurement, Evaluation, Research & Statistics  
[3 credit hours (0, 0, 8)]  
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 (0, 0, 0-3)]  
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 (0, 0, 0-3)]  
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 (3, 0, 0)]
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 (4, 0, 0)]
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: Summer, Fall

SPSY 5060 Prepractica in School Psychology
[2 credit hours (0, 0, 4)]
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 (3, 0, 0)]
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 (4, 0, 0)]
Provides training in standardized and curriculum based academic assessment methods and linking assessment to intervention. Includes instruction in evidence-based interventions, administering, scoring, interpreting, and communicating assessment results in written reports.
Prerequisites: SPSY 5030
Term Offered: Spring, Fall

SPSY 5310 Psychoeducational Assessment And Interventions II
[4 credit hours (4, 0, 0)]
Prerequisites: SPSY 5300 (may be taken concurrently)
Term Offered: Summer

SPSY 5610 Seminar I: Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
Orientation to the Graduate Certificate in Teaming in Early Childhood. Focus on individual competencies needed to work collaboratively to meet the needs of young children with disabilities and their families.
Prerequisites: SPED 5270
Term Offered: Summer

SPSY 5620 Seminar II: Leadership and Advocacy Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This second seminar in the Graduate Certificate in Teaming in Early Childhood focuses on skills and policies that promote best practices in teaming to support young children with disabilities.
Prerequisites: SPED 5270 and SPSY 5610
Term Offered: Summer, Fall

SPSY 5630 Seminar III: Evidence-Based Practice and Innovation in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This third seminar in the Graduate Certificate in Teaming in Early Childhood provides students the opportunity to reflect on their practicum experiences in teaming to support young children with disabilities.
Prerequisites: SPED 5270 and SPSY 5610 and SPSY 5620
Corequisites: SPSY 5640
Term Offered: Spring, Summer

SPSY 5640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
The practicum provides an opportunity to engage in interprofessional teaming in order to provide integrated services to young children with special needs in an inclusive setting.
Prerequisites: SPED 5270 and SPSY 5610 and SPSY 5620
Corequisites: SPSY 5630
Term Offered: Spring, Summer

SPSY 5980 Special Topics In Counseling, Mental Health, And School Psychology
[1-3 credit hours (0, 0, 0-3)]
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
[3 credit hours (3, 0, 0)]
Examination of disorders of childhood adolescence from an ecological perspective, focusing on understanding characteristics and causes, diagnosis both medical and educational, and identification of interventions for school and home.
Term Offered: Spring

SPSY 6990 Master's Independent Study
[1-4 credit hours (0, 0, 0-4)]
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
SCHOOL PSYCHOLOGY (SPSY)

**SPSY 7170 Consultation I: Theories And Techniques**
[3 credit hours (3, 0, 0)]
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

**SPSY 7180 Consultation II: School and Home Collaboration**
[3 credit hours (3, 0, 0)]
Provides training in universal/system-level academic interventions with an emphasis on consultation practices used to develop and sustain school and home collaboration. Includes study and review of prevention programs for student academic success and system-level academic assessment methods.

**Term Offered:** Summer, Fall

**SPSY 7190 Consulting III: School-Community**
[4 credit hours (4, 0, 0)]
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

**SPSY 7260 Developmental Child Psychopathology**
[3 credit hours (3, 0, 0)]
Examination of disorders of childhood adolescence from an ecological perspective, focusing on understanding characteristics and causes, diagnosis both medical and educational, and identification of interventions for school and home.

**Term Offered:** Spring

**SPSY 7310 Psychoeducational Assessment And Interventions II**
[4 credit hours (4, 0, 0)]

**Prerequisites:** SPSY 5300 (may be taken concurrently)

**Term Offered:** Summer, Fall

**SPSY 7320 Psychoeducational Assessment And Interventions III**
[4 credit hours (4, 0, 0)]
Provides training and practice in assessment of cognitive and adaptive functioning for school-age children. Includes instruction in administering, scoring, interpreting, and communicating assessment results, and in writing comprehensive written reports.

**Prerequisites:** SPSY 7310 or SPSY 5310

**Term Offered:** Spring, Fall

**SPSY 7330 PRACTICA IN SCHOOL PSYCHOLOGY**
[1-4 credit hours (0, 0, 1-4)]
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.

**Prerequisites:** SPSY 5310 or SPSY 7310

**Term Offered:** Spring, Summer, Fall

**SPSY 7340 School Psychology Practicum II**
[4 credit hours (0, 0, 4)]
Practice in individual evaluation, assessment and intervention design, with preschool and other special populations. Includes practice in functional behavioral assessment.

**Prerequisites:** SPSY 7330

**SPSY 7510 Supervision In Counseling And School Psychology**
[3 credit hours (3, 0, 0)]
Training in supervision models, methods, roles, ethical issues, research and evaluation. Advanced training in consultation.

**SPSY 7530 Advanced Theories Of Counseling And Consultation**
[4 credit hours (4, 0, 0)]
Advanced preparation in theory pertaining to the principles and practice of individual counseling, group work and consultation.

**SPSY 7920 Specialist Research Project**
[1-3 credit hours (0, 0, 0-3)]
In this capstone experience, specialist students review the literature, report implications and produce a project which can be applied in school psychology and counseling-related settings.

**SPSY 7930 Doctoral Research Seminar**
[3 credit hours (3, 0, 0)]
Advanced preparation in research problems, design and implementation of quantitative and qualitative research and methodology in the fields of counseling and supervision.

**SPSY 7940 Internship In School Psychology**
[1-8 credit hours (0, 0, 0-8)]
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

**Term Offered:** Spring, Summer, Fall

**SPSY 8480 Advanced Training In Professional, Legal, And Ethical Issues**
[3 credit hours (0, 0, 3)]
Advanced training in contemporary professional, legal and ethical issues that regulate or affect the work of counselors, psychologists and other mental health professionals.

**SPSY 8930 Advanced Doctoral Seminar**
[3 credit hours (3, 0, 0)]
This seminar will consider problems and provide advanced study. Open only to advanced graduate students.

**SPSY 8950 Workshop In Counseling, Mental Health, And School Psychology**
[1-6 credit hours (0, 0, 0-12)]
Workshops developed around topics of interest and concern to counselors, school psychologists, or other mental health care professionals. Practical application of topics will be stressed.

**SPSY 8960 Doctoral Research Dissertation**
[1-12 credit hours (0, 0, 0-12)]
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.
SPSY 8980 Special Topics In Counseling, Mental Health, And School Psychology
[1-3 credit hours (0, 0, 0-3)]
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

SPSY 8990 Doctoral Independent Study
[1-4 credit hours (0, 0, 0-4)]
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.
SEVERE BEHAVIORAL SPECTRUM (SBS)

SBS 6410 Theory And Research: Emotional Behavioral Disorders
[3 credit hours (0, 0, 3)]
This course provides in-depth readings on problems of emotionally and behaviorally disturbed/disordered children and youth. Intense study on two levels: (1) theoretical considerations and (2) treatments pertinent to diverse educational settings.

SBS 6420 Public School Emotional Behavior Disorders
[1 credit hour (0, 0, 2)]
This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. Public school settings include: self-contained, resource, transition, mainstreamed and consultative-collaborative teaching roles.

SBS 6430 Alternative School Setting: Ebd
[1 credit hour (0, 0, 2)]
This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. The alternative school setting includes: self-contained, transition-mainstreamed and consultative-collaborative teaching roles.

SBS 6440 Teaching Children And Youth With Emotional Behavior Disorders
[3 credit hours (0, 0, 3)]
This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral disorders/disturbances. Psychosocial educational best practices within the least restrictive environment are presented.
Prerequisites: SPED 6410

SBS 6450 Adjudicated-Locked Setting: Ebd
[1 credit hour (0, 0, 2.5)]
This course provides supervised practice in classroom participation with children and youth identified as Emotionally Behaviorally Disturbed/Disordered. The adjudicated-locked setting includes: self-contained, remedial plus consultative-collaborative teaching roles.
Prerequisites: (SPED 6420 and SPED 6430)

SBS 6460 Hospital Setting: Ebd
[1 credit hour (0, 0, 2)]
This course provides supervised practice teaching children and youth identified as Emotionally Behaviorally Disturbed/Disordered. Hospital setting include: self-contained, individualized and group tutoring, and consultative-collaborative teaching roles.

SBS 6470 Theory And Research: Autism
[3 credit hours (0, 0, 3)]
This course provides in-depth readings in the field of autism. The course includes intense study on two levels: (1) theoretical considerations and (2) treatment approaches pertinent to populations with autism.
Prerequisites: SBS 6460

SBS 6480 Teaching Children And Youth With Autism
[3 credit hours (0, 0, 3)]
This course provides research based methodologies for understanding and teaching children and youth with autism. Psychosocial educational best practices within the least restrictive environment are presented.
Prerequisites: SBS 6470

SBS 6510 Management Of Severe Behaviors Of Incarcerated Children And Youth
[3 credit hours (3, 0, 0)]
Managing severe behaviors of incarcerated children and youth, including learning knowledge, skills and a solid dispositional commitment to empower cognitive-behavioral change through emotional, neurological, biophysical, sociological and cultural barriers.

SBS 6520 Practicum: Child Study Institute
[1 credit hour (0, 0, 1)]
The Child Study Institute, Lucas County Juvenile Detention Center, offers frontline knowledge-to-skill practicing in the management of incarcerated children and youth with severe, chronic and potentially violent behaviors.

SBS 6990 Independent Study: Severe Behavior
[1-5 credit hours (0, 0, 0-5)]
Provides advanced graduate students with opportunities to study severe behavior related issues. Individual meetings with sponsoring faculty are scheduled.

SBS 8410 Theory And Research: Emotional Behavioral Disorders
[3 credit hours (0, 0, 3)]
This course provides in-depth readings on problems of emotionally and behaviorally disturbed/disordered children and youth. Intense study on two levels: (1) theoretical considerations and (2) treatments pertinent to diverse educational settings.

SBS 8420 Public School: Emotional Behavior Disorders
[1 credit hour (0, 0, 2.5)]
This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. Public school settings include: self-contained, resource, transition, mainstreamed and consultative-collaborative teaching roles.

SBS 8430 Alternative School Setting: Ebd
[1 credit hour (0, 0, 2.5)]
This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. The alternative school setting includes: self-contained, transition-mainstreamed and consultative-collaborative teaching roles.

SBS 8440 Teaching Children And Youth With Emotional Behavior Disorders
[3 credit hours (0, 0, 3)]
This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral disorders/disturbances. Psychosocial educational best practices within the least restrictive environment are presented.
Prerequisites: SPED 6410

SBS 8450 Adjudicated-Locked Setting: Ebd
[1 credit hour (0, 0, 2.5)]
This course provides supervised practice in classroom participation with children and youth identified as Emotionally Behaviorally Disturbed/Disordered. The adjudicated-locked setting includes: self-contained, remedial plus consultative-collaborative teaching roles.

SBS 8460 Hospital Setting: Ebd
[1 credit hour (0, 0, 2)]
This course provides supervised practice teaching children and youth identified as Emotionally Behaviorally Disturbed/Disordered. Hospital setting include: self-contained, individualized and group tutoring, and consultative-collaborative teaching roles.

SBS 8470 Theory And Research: Autism
[3 credit hours (0, 0, 3)]
This course provides in-depth readings in the field of autism. The course includes intense study on two levels: (1) theoretical considerations and (2) treatment approaches pertinent to populations with autism.
Prerequisites: SBS 6460

SBS 8480 Teaching Children And Youth With Autism
[3 credit hours (0, 0, 3)]
This course provides research based methodologies for understanding and teaching children and youth with autism. Psychosocial educational best practices within the least restrictive environment are presented.
Prerequisites: SBS 6470

SBS 8510 Management Of Severe Behaviors Of Incarcerated Children And Youth
[3 credit hours (3, 0, 0)]
Managing severe behaviors of incarcerated children and youth, including learning knowledge, skills and a solid dispositional commitment to empower cognitive-behavioral change through emotional, neurological, biophysical, sociological and cultural barriers.

SBS 8520 Practicum: Child Study Institute
[1 credit hour (0, 0, 1)]
The Child Study Institute, Lucas County Juvenile Detention Center, offers frontline knowledge-to-skill practicing in the management of incarcerated children and youth with severe, chronic and potentially violent behaviors.

SBS 8990 Independent Study: Severe Behavior
[1-5 credit hours (0, 0, 0-5)]
Provides advanced graduate students with opportunities to study severe behavior related issues. Individual meetings with sponsoring faculty are scheduled.
SBS 8460 Hospital Setting: Ebd
[1 credit hour (0, 0, 2.5)]
This course provides supervised practice teaching children and youth identified as Emotionally Behaviorally Disturbed/Disordered. Hospital setting include: self-contained, individualized and group tutoring, and consultative-collaborative teaching roles.
**Prerequisites:** (SBS 8420 and SBS 8430)

SBS 8470 Theory And Research: Autism
[3 credit hours (0, 0, 3)]
This course provides in-depth readings in the field of autism. The course includes intense study on two levels: (1) theoretical considerations and (2) treatment approaches pertinent to populations with autism.
**Prerequisites:** SBS 8460

SBS 8480 Teaching Children And Youth With Autism
[3 credit hours (0, 0, 3)]
This course provides research based methodologies for understanding and teaching children and youth with autism. Psychosocial educational best practices within the least restrictive environment are presented.
**Prerequisites:** SBS 8470

SBS 8510 Management Of Severe Behaviors Of Incarcerated Children And Youth
[3 credit hours (3, 0, 0)]
Managing severe behaviors of incarcerated children and youth, including learning knowledge, skills and a solid dispositional commitment to empower cognitive-behavioral change through emotional, neurological, biophysical, sociological and cultural barriers.

SBS 8520 Practicum: Child Study Institute
[1 credit hour (0, 0, 1)]
The Child Study Institute, Lucas County Juvenile Detention Center, offers frontline knowledge-to-skill practicing in the management of incarcerated children and youth with severe, chronic and potentially violent behaviors.

SBS 8990 Independent Study: Severe Behavior
[1-5 credit hours (0, 0, 0-5)]
Provides advanced graduate students with opportunities to study severe behavior related issues. Individual meetings with sponsoring faculty are scheduled.
SOCIAL WORK (SOCW)

SOCW 5010 Social Work Research Methods And Analysis
[3 credit hours (3, 0, 0)]
Course introduces students to qualitative and quantitative research methodologies, supporting statistical methods as utilized within the social work profession, data analysis technology and evidenced based social work practice concepts.  
Term Offered: Summer, Fall

SOCW 5110 Social Work Practice I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 and SOCW 5210  
Term Offered: Spring

SOCW 5130 Social Work Practice III
[3 credit hours (3, 0, 0)]
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  
Term Offered: Spring

SOCW 5210 Micro Social Work Perspectives In Human Behavior And The Social Environment
[3 credit hours (3, 0, 0)]
Course is organized on a developmental model including social work perspectives 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 (3, 0, 0)]
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  
Term Offered: Spring

SOCW 5330 Policy Issues And Analysis In Social Work
[3 credit hours (3, 0, 0)]
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: Summer, Fall

SOCW 5900 FOUNDATION FIELD EXPERIENCE AND INTEGRATIVE SEMINAR I
[3 credit hours (0, 0, 10)]
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.  
Corequisites: SOCW 5010, SOCW 5110, SOCW 5210, SOCW 5330  
Term Offered: Fall

SOCW 5910 FOUNDATION FIELD EXPERIENCE AND INTEGRATIVE SEMINAR II
[3 credit hours (0, 0, 16)]
Students continue in the field agency assigned in SOCW 5900; complete 240 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 or SOCW 5120 or SOCW 5220  
Corequisites: SOCW 5130  
Term Offered: Spring, Summer

SOCW 6030 Research Methods For Macro Social Work Practice
[3 credit hours (3, 0, 0)]
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.  
Prerequisites: SOCW 5010  
Term Offered: Fall

SOCW 6040 Research Methods For Micro Social Work Practice
[3 credit hours (3, 0, 0)]
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.  
Prerequisites: SOCW 5010  
Term Offered: Fall

SOCW 6110 Advanced Generalist Practice I
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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  
Term Offered: Spring, Summer
SOCW 6130 Advanced Generalist Practice III
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

SOCW 6140 Advanced Social Work Assessment
[3 credit hours (3, 0, 0)]
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 assessment purposes. Prerequisites all 5000 level courses, advanced standing status or by permission.
Term Offered: Spring, Summer

SOCW 6410 Social Work Micro Practice with Children and Families
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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
Term Offered: Spring

SOCW 6450 Social Work Journal Review Seminar I: Child And Family Services
[1 credit hour (0, 0, 1)]
This course enables students to gain a critical understanding and appreciation of the social work literature and research underpinning social work practice in child and family services. Prerequisite: All 5000-level classes and SOCW 6140. Corequisites: SOCW 6110, 6410, or permission of instructor.
Term Offered: Fall

SOCW 6460 Social Work Journal Review Seminar II - Child And Family Services
[1 credit hour (0, 0, 1)]
Course provides a more in depth examination and appreciation of social work literature and research underpinning social work practice with children and family services. Prerequisite: SOCW 6110, 6140, 6410 with a B or better. Corequisite: 6430.
Prerequisites: SOCW 6460
Term Offered: Spring

SOCW 6510 Social Work Micro Practice in Mental Health
[3 credit hours (3, 0, 0)]
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.
Term Offered: Fall

SOCW 6530 Social Work Macro Practice in Mental Health
[3 credit hours (3, 0, 0)]
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
Term Offered: Spring

SOCW 6560 Social Work Journal Review Seminar I - Mental Health Practice
[1 credit hour (0, 0, 1)]
Course enables students to gain a critical understanding and appreciation of the social work literature and research underpinning social work practice in mental health settings. Prerequisites: All 5000-level classes, advanced standing status, and SOCW 6140. Corequisites: SOCW 6110, 6510, or permission of instructor.
Term Offered: Fall

SOCW 6570 Social Work Journal Review Seminar II - Mental Health Practice
[1 credit hour (0, 0, 1)]
Course provides a more in depth examination and appreciation of social work literature and research underpinning social work practice in mental health settings. Prerequisites: SOCW 6110, 6140, 6510 with a B or better.
Prerequisites: SOCW 6560
Term Offered: Spring

SOCW 6610 Social Work Practice In The Aging Community
[3 credit hours (3, 0, 0)]
Course provides an understanding of social worker’s role in aging practice settings. Included are major theoretical perspectives currently accepted in the field with emphasis on strengths and empowerment.

SOCW 6630 Social Work Policy Issues In Aging
[3 credit hours (3, 0, 0)]
Course provides knowledge about the current policy issues concerning social work services for the elderly. Major emphasis is placed on social and economic justice in the resolution of policy conflicts.

SOCW 6660 Social Work Journal Review Seminar I - Aging Services
[1 credit hour (0, 0, 1)]
Course provides an understanding and appreciation of the social work literature and research underpinning social work practice with older adults.
SOCW 6670 Social Work Journal Review Summer II - Aging Services
[1 credit hour (0, 0, 1)]
Course provides a more in depth examination and appreciation of the social work literature and research underpinning social work practice with older adults.
Prerequisites: SOCW 6660

SOCW 6700 Perspectives on Child Maltreatment and Child Advocacy
[3 credit hours (0, 0, 3)]
This course provides a foundation of in-depth information on the child protection system in the U.S., child neglect, child physical abuse, child sexual abuse the investigation, and substantiation of maltreatment, and the role of advocacy in the process.
Term Offered: Fall

SOCW 6900 ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR I
[5 credit hours (0, 0, 24)]
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 and SOCW 6410 (may be taken concurrently) or SOCW 6510 (may be taken concurrently) and SOCW 6560
Term Offered: Fall

SOCW 6910 ADVANCED FIELD EXPERIENCE AND INTEGRATIVE SEMINAR II
[5 credit hours (0, 0, 24)]
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 and SOCW 6430 (may be taken concurrently) or SOCW 6530 (may be taken concurrently)
Term Offered: Spring

SOCW 6960 Thesis
[1-6 credit hours (0, 0, 0-1)]
This course involves research leading to a written thesis. Thesis topic, defense, and final thesis must be approved by the student’s thesis committee.
Term Offered: Fall

SOCW 6980 Special Topics in Social Work
[1-3 credit hours (0, 0, 0-1)]
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 (0, 0, 0-1)]
Directed study in social work under the supervision of a social work faculty member.
Term Offered: Spring, Summer, Fall

SOCW 7610 Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
Students will become familiar with and develop a plan of study which will lead to successful completion of the requirements for the Graduate Certificate in Teaming in Early Childhood. Students will demonstrate an understanding of conflict resolution and working with others whose values and beliefs differ significantly from their own.
Prerequisites: SPED 7270

SOCW 7620 Leadership and Advocacy in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This seminar focuses on developing the skills to promote best practice in teaming. Students will explore the factors that support and threaten interprofessional collaboration. They will become aware of policies affecting teaming. Finally, students will engage in advocacy for teaming that will benefit individuals with disabilities.
Prerequisites: SOCW 7610
Term Offered: Summer

SOCW 7630 Evidence-Based Practice and Innovation in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
The purpose of this seminar is to provide an opportunity for students to reflect on their practicum experiences as well as examine issues related to principles of ethical practice, professional identity and advocacy to promote the well-being of young children with special needs and their families. Students will also explore ways in which technology can promote effective teaming practices with other professionals as well as with family members.
Corequisites: SOCW 7640
Term Offered: Spring, Summer

SOCW 7640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
The purpose of this practicum is to provide students enrolled in the Graduate Certificate in Teaming and Early Childhood program with an opportunity to engage in interprofessional teaming in order to provide integrated services to young children with special needs and their families in an inclusive setting. During this practicum, students will complete a minimum of 60 clock hours directly working with team members, young children with special needs, and their families.
Prerequisites: SOCW 7620
Corequisites: SOCW 7630
Term Offered: Summer
SOCIOMETRY (SOC)

SOC 5040 Classical Theory
[3 credit hours (0, 0, 3)]
Term Offered: Fall

SOC 5100 Community Organizing And Development
[3 credit hours (3, 0, 0)]
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 5110 Political Sociology
[3 credit hours (0, 0, 3)]
Examination of political institutions, organizations and behavior with special attention to participation, power, ideology, decision making and conflict.

SOC 5160 Health And Gender
[3 credit hours (0, 0, 3)]
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: Summer, Fall

SOC 5170 Law And Society
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
Introduction to procedures used in the various phases of sociological research.
Term Offered: Spring, Fall

SOC 5290 Social Research Statistics
[3 credit hours (0, 0, 3)]
Study of major statistical procedures and techniques in sociology.
Term Offered: Spring, Fall

SOC 5340 Population And Society
[3 credit hours (3, 0, 0)]
Examination of the interaction among variables of population (fertility, mortality and migration) and other aspects of societal organization.
Term Offered: Fall

SOC 5440 Methods Of Population Analysis
[3 credit hours (3, 0, 0)]
Methods of population analysis, including examination and evaluation of data sources.

SOC 5450 Exploring the City
[3 credit hours (0, 0, 3)]
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: Fall

SOC 5560 Fieldwork in Sociology
[6 credit hours (2, 0, 4)]
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 5580 Science, Technology, And Social Change
[3 credit hours (3, 0, 0)]
The impact of rapidly changing science and technology on North American society; social change in a technological age; the emergence of post industrial society.

SOC 5610 Sociology Of Organizations
[3 credit hours (0, 0, 3)]
Study of the structure and processes of organizations; includes theory of bureaucratic and non-bureaucratic organizations, as well as structure and function of organizations.
Term Offered: Spring

SOC 5650 ADVANCED TOPICS IN LATIN AMERICAN AND CARIBBEAN
[3 credit hours (3, 0, 0)]
An examination of social life in Latin America and the Caribbean, focusing on changing political economy, gender and ethnicity, globalization, culture and migration and in and out of the region.
Prerequisites: SOC 1010

SOC 5710 Criminology
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
Study of the analysis of the nature, meaning and process of deviant behavior in terms of social norms, control and societal reaction.
Term Offered: Summer

SOC 5740 Issues In Crime
[3 credit hours (0, 0, 3)]
Topics may include legalizing drugs, police violence, plea bargaining, death sentence and mandatory sentencing. Emphasizes liberal/conservative ideology.
SOC 5750 Legal Issues
[3 credit hours (3, 0, 0)]
Topics may include abortion, three strike sentencing, homosexual rights, hate speech and decriminalizing narcotics. Emphasizes liberal/conservative ideology.

SOC 5760 Juvenile Delinquency
[3 credit hours (0, 0, 3)]
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 5800 Development Of Subordinate Nations
[3 credit hours (3, 0, 0)]
The new emerging ideological, political, social and economic patterns which repeat themselves in and determine the Third World transition from a traditional to a new society.
Term Offered: Fall

SOC 5810 Gender In Cross-Cultural Perspective
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
This course will focus on social movements and their political context to understand the causes of social movement success and failure. Special attention will be given to the 1960s wave of protest, as well as to contemporary movement forms. Students will engage in intensive case study research applying the course concepts in addition to reading and writing on relevant topics.
Term Offered: Spring, Fall

SOC 5980 Special Topics In Sociology
[3 credit hours (3, 0, 0)]
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 (0, 0, 3)]
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
[1 credit hour (1, 0, 0)]
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: Fall

SOC 6040 Advanced Sociological Theory
[3 credit hours (3, 0, 0)]
Building on classical traditions, the course includes readings and lectures on functionalist, neo-Marxist, symbolic interactionist and other significant twentieth century sociological theories.
Prerequisites: SOC 4040 or SOC 5040
Term Offered: Fall

SOC 6050 Advanced Social Theory And Political Economy
[3 credit hours (0, 0, 3)]
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 or SOC 5040
Term Offered: Spring

SOC 6270 Advanced Social Research Methods
[3 credit hours (3, 0, 0)]
Examination of advanced methods of data collection in sociological research.
Prerequisites: SOC 5270
Term Offered: Spring, Fall

SOC 6290 Advanced Social Research Statistics
[3 credit hours (0, 0, 3)]
Examination of advanced methods of data analysis in sociological research.
Prerequisites: SOC 5290
Term Offered: Spring

SOC 6640 Seminar in Diversity and Inequality
[3 credit hours (0, 0, 3)]
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 6800 Seminar In Theories In Social Psychology
[3 credit hours (3, 0, 0)]
Intensive sociological study of theory building in social psychology including, among others, paradigms of social cognition and belief, social influence, and social relations.

SOC 6900 Independent Research In Sociology
[1-3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
Seminar on selected topics in the field of Sociology.
Term Offered: Spring, Fall

SOC 6940 Graduate Internship
[3 credit hours (0, 0, 9)]
In applied setting in areas of student interest: community organizing - health-probation - gerontology.
Prerequisites: (SOC 6040 or SOC 6050) and SOC 6270 and SOC 6290
Term Offered: Spring, Summer, Fall

SOC 6960 Thesis
[1-6 credit hours (0, 0, 0-3)]
Topic (proposal) is selected by the student and approved by a thesis committee.
Prerequisites: (SOC 6270 and SOC 6290 and SOC 6040 or SOC 6050)
Term Offered: Spring, Summer, Fall
**SOC 6970 Master of Sociology Project**
[1-6 credit hours (0, 0, 1-6)]
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 (0, 0, 0-3)]
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 (3, 0, 0)]
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 (4, 0, 0)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (4, 0, 0)]
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 (0, 0, 3)]
A practical course in the theories, methods and specific techniques of teaching Spanish.
Term Offered: Fall

SPAN 5160 Latin American Novel I
[3 credit hours (3, 0, 0)]
A study of the Latin American novel from the nineteenth century to the authors of the literary Boom of 1963.
Term Offered: Spring, Fall

SPAN 5170 Latin American Novel II
[3 credit hours (3, 0, 0)]
A study of the major developments in Latin American novel from the Boom to the present.
Term Offered: Spring, Fall

SPAN 5210 Spanish For Reading Knowledge I
[3 credit hours (3, 0, 0)]
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 5220 Spanish For Reading Knowledge II
[3 credit hours (3, 0, 0)]
Study of those elements of structure and vocabulary most appropriate for preparing graduate students to read effectively in Spanish. (Not for majors)

SPAN 5250 Latin American Short Story
[3 credit hours (3, 0, 0)]
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 5310 Medieval & Renaissance Spanish Literature
[3 credit hours (3, 0, 0)]
Study of major works from the Poema de Mio Cid to the early writers of the Siglo de Oro.
Term Offered: Spring

SPAN 5820 Modern Spanish Drama
[3 credit hours (0, 0, 3)]
Critical readings of Spanish drama from Romanticism to the latest contemporary trends.

SPAN 5830 Hispanic Cinema
[3 credit hours (3, 0, 0)]
Critical viewings of Spanish-language films from Spain and the Americas. Emphasis on cultural criticism.
Term Offered: Spring

SPAN 5860 Special Topics
[3 credit hours (3, 0, 0)]
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 (0, 0, 0-1)]
May be repeated for additional credit when topic varies.
Term Offered: Spring, Summer, Fall

SPAN 6930 Seminar: Selected Topics
[1-3 credit hours (0, 0, 0-3)]
Selected topics from Spanish culture, linguistics, or literature.
Term Offered: Spring, Fall
SPATIALLY INTEGRATED SOC SCI (SISS)

SISS 7010 Spatial Statistics
[3 credit hours (0, 0, 3)]
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: Fall

SISS 7020 GEOGRAPHICAL INFORMATION SCIENCE IN SISS
[3 credit hours (0, 0, 3)]
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
[4 credit hours (4, 0, 0)]
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 (0, 0, 3)]
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
Term Offered: Spring

SISS 8030 ADVANCED SPATIAL DATA ANALYSIS
[3 credit hours (0, 0, 3)]
Examination of spatial processes: spatial autoregressive models, gaussian Markov random field models, auto-logistic models, spatial discrete choice models. The topics include spatial panel data models, their applications and estimation methods.
Prerequisites: SISS 7010
Term Offered: Spring

SISS 8040 Research Design
[2 credit hours (2, 0, 0)]
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 and SISS 8020
Term Offered: Spring

SISS 8150 ADVANCED QUALITATIVE ANALYSIS IN SISS
[3 credit hours (0, 0, 3)]
Advanced qualitative analysis techniques and applications to a broad range of spatially oriented social science problems.
Prerequisites: SISS 7010 and SISS 7020 and SISS 8010

SISS 8170 SPACE AND SOCIETY CRITICAL THEORY IN SISS
[3 credit hours (0, 0, 3)]
Critical examination of both the role of spatial inquiry and its limitations to the understanding of society and space.
Prerequisites: SISS 7010 and SISS 7020 and SISS 8010
Term Offered: Spring

SISS 8180 DISCRETE CHOICE SPATIAL PROCESS MODELING
[3 credit hours (0, 0, 3)]
The study of the human factor in spatial processes with the aim to advance understanding of spatial aspects of social dynamics by modeling discrete choice spatial processes.
Prerequisites: SISS 7010 and SISS 7020 and SISS 8010

SISS 8200 SPATIAL PERSPECTIVES ON THE ENVIRONMENT
[3 credit hours (0, 0, 3)]
Examination of the relationship between SISS approaches and human interaction with the natural environment.
Prerequisites: SISS 7010 and SISS 7020 and SISS 8010
Term Offered: Spring, Fall

SISS 8920 Directed Readings in SISS
[3 credit hours (0, 0, 3)]
Independent study of research literature in Spatially Integrated Social Science and related fields.
Prerequisites: SISS 7010 and SISS 7020 and SISS 8010
Term Offered: Spring, Summer, Fall

SISS 8940 Seminar in Special Topics
[3 credit hours (0, 0, 3)]
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 and SISS 7020 and SISS 8010
Term Offered: Spring, Summer, Fall

SISS 8960 Doctoral Dissertation Research
[1-12 credit hours (0, 0, 1-12)]
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
SPECIAL EDUCATION (SPED)

SPED 5000 Issues In Special Education
[3 credit hours (3, 0, 0)]
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 (2.5, 0, 0)]
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

SPED 5080 Curriculum Adaptations and Strategies in Early Childhood Education
[3 credit hours (3, 0, 0)]
[3 hours] Early childhood development, including learning and behavioral characteristics examined focusing on implications of developmental delay and risk. Implications for IEP-based instruction explored. Strategies that support inclusion discussed. Prerequisite: CIEC 5000, EDP 5210, SPED 5010.
Term Offered: Spring, Fall

SPED 5120 Students With Special Needs: Developmental And Educational Implication
[3 credit hours (3, 0, 0)]
In-depth study of personality, psychological and physical development, and educational needs of atypical children: including current research issues in areas of social, legal and environmental aspects of exceptional populations.

SPED 5150 Advanced Practicum For Teaching Students With Moderate Educational Needs
[1 credit hour (0, 0, 2.7)]
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, Fall

SPED 5160 Advanced Instructional Methods For Teaching Students With Moderate Educational Needs
[3 credit hours (3, 0, 0)]
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 Supporting Youths And Adults With Disabilities Living And Working In The Community
[3 credit hours (3, 0, 0)]
In-depth study of issues faced by adults with severe and multiple disabilities and their families. Emphasis on supported employment, residential options, self-determination, recreation and quality of life issues. Field experience required.
Term Offered: Fall

SPED 5180 Advanced Instructional Methods For Teaching Students With Intensive Educational Needs
[3 credit hours (3, 0, 0)]
An in-depth examination of appropriate curriculum models, instructional strategies and adaptations, and related behavior problems for students with severe and multiple disabilities. A transdisciplinary team approach is explored.
Term Offered: Spring

SPED 5190 Advanced Practicum For Students With Intensive Needs
[1 credit hour (0, 0, 1)]
This course is taken with SPED 5180 to apply strategies and techniques for teaching students with intensive needs. Forty field hours are required.
Term Offered: Spring

SPED 5210 Augmentative and Alternative Communication
[3 credit hours (3, 0, 0)]
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.

SPED 5220 Research And Practice In Teaching Phonics, Reading And Writing To Students With Special Needs
[3 credit hours (3, 0, 0)]
Current trends and issues in teaching reading and writing to students with disabilities. Examination of research supporting various methods. Application of research-based methods into practical strategies for classroom implementation. Twenty-four hours of field required.
Term Offered: Summer, Fall

SPED 5230 Advanced Field Practicum In Diagnostic And Prescriptive Teaching
[1 credit hour (0, 0, 2.5)]
Provides the laboratory to rehearse and refine the teaching skills presented in SPED 5/7220. Required of persons seeking initial special education certification. Forty field hours required. Taken concurrently with SPED 5220.

SPED 5240 Disorders and Characteristics of Students with Emotional Disturbance
[3 credit hours (0, 0, 3)]
This course introduces conceptual models of emotional disturbance (ED) in children and adolescents. Definitive diagnostics categories and their etiology are presented in contexts of their use in a variety of educational settings appropriate for children and adolescents with ED.
Prerequisites: SPED 5000
SPED 5250 Career And Vocational Education For Students With Disabilities
[3 credit hours (3, 0, 0)]
This course covers career and vocational education activities for youths with disabilities. Special emphasis placed on developing and implementing an Individual Transition Plan (ITP) and coordination with adult service providers.
Term Offered: Spring, Summer

SPED 5260 Family And Professional Relations In Special Education
[3 credit hours (3, 0, 0)]
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 (2.5, 0, 0)]
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 (2.5, 0, 0)]
Aspects of quality environments, in the home and in early childhood centers for young children with special needs. Of particular interest is identifying characteristics of natural environments that promote positive child outcomes.
Term Offered: Spring

SPED 5300 Teaching Literacy Skills To Adolescents With Disabilities
[3 credit hours (2.5, 0, 0)]
This course will review existing theories and research regarding teaching literacy to students with disabilities in 4th through 12th grades (those who did not learn to read by 3rd grade).
Term Offered: Summer

SPED 5310 Advanced Instructional Methods For Teaching Students With Mild Educational Needs
[3 credit hours (0, 0, 3)]
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 Advanced Field Practicum For Students With Mild Educational Needs
[1 credit hour (0, 0, 2.5)]
Provides opportunities for field experience to use and refine the strategies for persons with mild disabilities presented in SPED 5310.
Term Offered: Spring, Fall

SPED 5330 Advanced Child Study Institute: Ebd
[1 credit hour (0, 0, 2)]
Provides quality educational settings to inservice teachers to practice effective behavioral and academic managing of children and youth experiencing continuous emotional stress and trauma.

SPED 5340 Advanced Behavior Management
[3 credit hours (3, 0, 0)]
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 5450 Advanced Methods Of Teaching Students With Emotional Disturbance
[3 credit hours (0, 0, 3)]
This course provides evaluation and application techniques of research-based methodologies for teaching students with emotional disturbance in school-based settings within the least restrictive environment.
Prerequisites: SPED 5340
Term Offered: Fall

SPED 5510 Curriculum And Teaching Strategies: Physical And Other Health Impairments
[3 credit hours (3, 0, 0)]
Appropriate curriculum models, learning objectives and teaching strategies for students with physical or health impairing conditions are examined. Modification of materials, assessment options and alternatives response modes will be discussed.

SPED 5560 ADVANCED PROFESSIONAL REFLECTIVE SEMINAR
[3 credit hours (0, 0, 3)]
The focus of this seminar is on teaching as a profession. Student will complete The Student Teaching Portfolio Project, a performance-based assessment approach to licensure and professional development. Additionally, this internship seminar provides a forum for group sharing, reflection, professional issues, ethical behaviors, interview processes, and career development.
Corequisites: SPED 6940
Term Offered: Spring, Fall

SPED 5610 Seminar I: Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
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 5270
Term Offered: Summer

SPED 5620 Seminar II: Working Effectively with Team Members
[1 credit hour (0, 0, 1)]
Factors that support and threaten interprofessional collaboration. Become aware of policies affecting teaming. Engage in advocacy for teaming that will benefit individuals with disabilities.
Prerequisites: SPED 5610 and SPED 5270
Term Offered: Summer, Fall
Special Education (SPED)

SPED 5630 Seminar III: Evidence-Based Practice and Innovation in Teaming
[1 credit hour (0, 0, 1)]
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 5620
Corequisites: SPED 5640
Term Offered: Spring, Summer

SPED 5640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
Students will work as part of an inter-professional team to develop, implement, and evaluate integrated intervention plans designed to support the development of children who have special needs.
Prerequisites: SPED 5620
Corequisites: SPED 5650
Term Offered: Spring, Summer

SPED 5950 Workshop In Special Education
[1-5 credit hours (0, 0, 5)]
A workshop developed around topics of interest and concern for in-service teachers and other education personnel. Practical application of workshop topics will be emphasized.
Term Offered: Summer

SPED 5980 Special Topics In Special Education
[1-5 credit hours (0, 0, 5)]
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 (0, 0, 5)]
Individual study provides graduate students with 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 6060 K-3 Curr. Models and Int. Strategies
[3 credit hours (0, 0, 3)]
Examination of appropriate curriculum models, instructional strategies and adaptations for young students (K-3 grade) with mild to intensive educational needs. A trans-disciplinary team approach is explored with an emphasis on collaboration and communication.
Term Offered: Spring

SPED 6070 Curriculum Models And Intervention Strategies In Early Childhood Special Education
[3 credit hours (0, 0, 4)]
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. 20 clock hour practicum required.
Term Offered: Fall

SPED 6080 Clinical And Educational Evaluation Of Students With Disabilities
[3 credit hours (3, 0, 0)]
An in-depth study of instruments used by school psychologists and classroom teachers to access and evaluate students. The diagnostic uses and the understanding of the results will be the focus.

SPED 6220 Collaboration For Inclusive Schools
[3 credit hours (0, 0, 3)]
Provides information and competencies to develop, implement and evaluate collaborative programs. Educators will enhance their ability to collaborate so that they can better meet the needs of their students.

SPED 6250 Issues And Research In Transition And Post-Secondary Outcomes For Student With Disabilities
[3 credit hours (2.5, 0, 0)]
In-depth study of transition issues and outcomes focusing on: a) best practices, b) the roles and responsibilities of a transition specialist, c) inter-agency collaboration, d) team building, and e) program development, implementation and evaluation.
Term Offered: Spring

SPED 6350 Educational And Instructional Implications In Specific Learning Disabilities
[3 credit hours (3, 0, 0)]
Students will examine current trends in research and program development in Specific Learning Disabilities. The focus will be on learning and study skills: their implication in the development of learning.

SPED 6360 Clinical Practicum: Learning Strategies For Students With Specific Learning Disabilities
[1 credit hour (0, 0, 1.5)]
Provides advanced graduate student with supervised practice in developing and implementing strategies and study skills for persons with learning problems. Required 15 hours instructional practice and weekly meetings with supervisors.

SPED 6410 Theory And Research: Emotional Behavioral Disorders
[3 credit hours (0, 0, 3)]
This course provides in-depth readings on problems of emotionally and behaviorally disturbed/disordered children and youth. Intense study on two levels: (1) theoretical considerations and (2) treatments pertinent to diverse educational settings.
Term Offered: Fall

SPED 6420 Public School Emotional Behavior Disorders
[1 credit hour (0, 0, 2)]
This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. Public School settings include: self-contained, resource, transition, mainstreamed and consultative-collaborative teaching roles.
Term Offered: Spring, Summer

SPED 6440 Teaching Children And Youth With Emotional Behavior Disorders
[3 credit hours (3, 0, 0)]
This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral Disorders/disturbances. Psycho-social educational best practices within the least restrictive environment are presented.
Term Offered: Spring

SPED 6470 Theory And Research: Autism
[3 credit hours (3, 0, 0)]
This course provides in-depth readings in the field of autism. The course includes intense study on two levels: (1) theoretical considerations and (2) treatment approaches pertinent to populations with autism.
SPED 6480 Teach Youth/Child With Autism
[3 credit hours (3, 0, 0)]
This course provides research based methodologies for understanding and teaching children and youth with autism. Psycho-Social Educational best practices within the least restrictive environment are presented.

SPED 6900 Independent Research In Special Education
[1-5 credit hours (0, 0, 0-5)]
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 (0, 0, 0)]
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 (0, 0, 0-5)]
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 (0, 0, 0-16)]
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 6960 Master Research Thesis In Special Education
[1-5 credit hours (0, 0, 0-5)]
The master's thesis is an individually designed research study which meets the final activity requirement for completion of the master's degree.
Term Offered: Spring, Summer, Fall

SPED 6990 Independent Study In Special Education
[1-5 credit hours (0, 0, 0-5)]
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

SPED 7000 Issues In Special Education
[3 credit hours (3, 0, 0)]
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 7120 Students With Special Needs: Developmental And Educational Implication
[3 credit hours (3, 0, 0)]
In-depth study of personality, psychological and physical development, and educational needs of atypical children: including current research issues in areas of social, legal and environmental aspects of exceptional populations.

SPED 7150 Advanced Practicum For Teaching Students With Moderate Educational Needs
[1 credit hour (0, 0, 2.5)]
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 (3, 0, 0)]
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 Supporting Youths And Adults With Disabilities Living And Working In The Community
[3 credit hours (3, 0, 0)]
In-depth study of issues faced by adults with severe and multiple disabilities and their families. Emphasis on supported employment, residential options, self-determination, recreation and quality of life issues. Field experience required.
Term Offered: Fall

SPED 7180 Advanced Instructional Methods For Teaching Students With Intensive Educational Needs
[3 credit hours (3, 0, 0)]
An in-depth examination of appropriate curriculum models, instructional strategies and adaptations, and related behavior problems for students with severe and multiple disabilities. A transdisciplinary team approach is explored.
Term Offered: Spring

SPED 7190 Advanced Practicum For Students With Intensive Needs
[1 credit hour (0, 0, 1)]
This course is taken with SPED 7180 to apply strategies and techniques for teaching students with intensive needs. Forty field hours are required.
Term Offered: Spring

SPED 7210 Augmentative and Alternative Communication
[3 credit hours (3, 0, 0)]
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.
SPED 7220 Research And Practice In Teaching Phonics, Reading And Writing To Students With Special Needs
[3 credit hours (3, 0, 0)]
Current trends and issues in teaching reading and writing to students with disabilities. Examination of research supporting various methods. Application of research-based methods into practical strategies for classroom implementation. Twenty-four hours of field required.
Term Offered: Summer, Fall

SPED 7230 Advanced Field Practicum In Diagnostic And Prescriptive Teaching
[1 credit hour (0, 0, 2.5)]
Provides the laboratory to rehearse and refine the teaching skills presented in SPED 5/7220. Required of persons seeking initial special education certification. Forty field hours required. Taken concurrently with SPED 7220.

SPED 7250 Career And Vocational Education For Students With Disabilities
[3 credit hours (3, 0, 0)]
This course covers career and vocational education activities for youths with disabilities. Special emphasis placed on developing and implementing an Individual Transition Plan (ITP) and coordination with adult service providers.
Term Offered: Spring, Summer

SPED 7260 Family And Professional Relations In Special Education
[3 credit hours (3, 0, 0)]
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 (2.5, 0, 0)]
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 (2.5, 0, 0)]
Aspects of quality environments, in the home and in early childhood centers for young children with special needs. Of particular interest is identifying characteristics of natural environments that promote positive child outcomes.
Term Offered: Spring, Fall

SPED 7310 Advanced Instructional Methods For Teaching Students With Mild Educational Needs
[3 credit hours (3, 0, 0)]
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 Advanced Field Practicum For Students With Mild Educational Needs
[1 credit hour (0, 0, 2.5)]
Provides opportunities for field experience to use and refine the strategies for persons with mild disabilities presented in SPED 7310. Forty hours of field required.
Term Offered: Fall

SPED 7330 Advanced Child Study Institute: Ebd
[1 credit hour (0, 0, 2.5)]
Provides quality educational settings to in-service teachers to practice effective behavioral and academic managing of children and youth experiencing continuous emotional stress and trauma.

SPED 7340 Advanced Behavior Management
[3 credit hours (3, 0, 0)]
This course provides training in-service 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 7510 Curriculum And Teaching Strategies: Physical And Other Health Impairments
[3 credit hours (3, 0, 0)]
Appropriate curriculum models, learning objectives and teaching strategies for students with physical or health impairing conditions are examined. Modification of materials, assessment options and alternatives response modes will be discussed.

SPED 7610 Seminar I: Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
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
Term Offered: Summer

SPED 7620 Seminar II: Working Effectively with Team Members
[1 credit hour (0, 0, 1)]
Factors that support and threaten interprofessional collaboration. Become aware of policies affecting teaming. Engage in advocacy for teaming that will benefit individuals with disabilities.
Prerequisites: SPED 7610 and SPED 7270
SPED 7630 Seminar III: Evidence-Based Practice and Innovation in Teaming
[1 credit hour (0, 0, 1)]
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
Corequisites: SPED 7640
Term Offered: Summer

SPED 7640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
Students will work as part of an inter-professional team to develop, implement, and evaluate integrated intervention plans designed to support the development of children who have special needs.
Prerequisites: SPED 7620
Corequisites: SPED 7650
Term Offered: Summer

SPED 7680 Practical And Theoretical Implication Of Vision Impairment
[3 credit hours (0, 0, 3)]
A study of the research on the anatomy and physiology of the eye, visual impairments and the practical implication for learning, working and independent living.

SPED 7810 Low Vision: Theory & Research
[3 credit hours (0, 0, 3)]
An in-depth study of the field of low vision. Conditions, equipment and instruction will be reviewed and analyzed for their implication to the field of vision.

SPED 7880 Advanced Study Of Technology And Independent Daily Living For The Persons With Visual Impairment
[3 credit hours (0, 0, 3)]
This course includes the research regarding technology, strategies and an analytical evaluation of the independent living of the blind and visually impaired.

SPED 7950 Workshop In Special Education
[1-5 credit hours (0, 0, 0-5)]
A workshop developed around topics of interest and concern for in-service teachers and other education personnel. Practical application of workshop topics will be emphasized.
Term Offered: Summer

SPED 7980 Special Topics In Special Education
[1-5 credit hours (0, 0, 0-5)]
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 (0, 0, 0-5)]
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: Summer, Fall

SPED 8060 K-3 Curr Models and Int Strate
[3 credit hours (0, 0, 3)]
Examination of appropriate curriculum models, instructional strategies and adaptations for young students (K-3 grade) with mild to intensive educational needs. A trans-disciplinary team approach is explored with an emphasis on collaboration and communication.
Term Offered: Spring

SPED 8070 Curriculum Models And Intervention Strategies In Early Childhood Special Education
[3 credit hours (3, 0, 0)]
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. 20 clock hour practicum required.
Term Offered: Spring, Summer, Fall

SPED 8080 Clinical And Educational Evaluation Of Students With Disabilities
[3 credit hours (0, 0, 3)]
Provides information and competencies to develop, implement and evaluate collaborative programs. Educators will enhance their ability to collaborate so that they can better meet the needs of their students.

SPED 8220 Collaboration For Inclusive Schools
[3 credit hours (0, 0, 3)]
Provides information and competencies to develop, implement and evaluate collaborative programs. Educators will enhance their ability to collaborate so that they can better meet the needs of their students.

SPED 8250 Issues And Research In Transition And Post-Secondary Outcomes For Students With Disabilities
[3 credit hours (2.5, 0, 0)]
In-depth study of transition issues and outcomes focusing on: a) best practices, b) the roles and responsibilities of a transition specialist, c) inter-agency collaboration, d) team building, and e) program development, implementation and evaluation.
Term Offered: Spring

SPED 8350 Educational And Instructional Implications In Specific Learning Disabilities
[3 credit hours (3, 0, 0)]
Students will examine current trends in research and program development in Specific Learning Disabilities. The focus will be on learning and study skills: their implication in the development of learning.

SPED 8360 Clinical Practicum: Learning Strategies For Students With Specific Learning Disabilities
[1 credit hour (0, 0, 1.5)]
Provides advanced graduate student with supervised practice in developing and implementing strategies and study skills for persons with learning problems. Required 15 hours instructional practice and weekly meetings with supervisors.

SPED 8410 Theory And Research: Emotional Behavioral Disorders
[3 credit hours (0, 0, 3)]
This course provides in-depth readings on problems of emotionally and behaviorally disturbed/disordered children and youth. Intense study on two levels: (1) theoretical considerations and (2) treatments pertinent to diverse educational settings.
SPED 8420 Public School Emotional Behavior Disorders
[1 credit hour (0, 0, 2.5)]
This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. Public School settings include: self-contained, resource, transition, mainstreamed and consultative-collaborative teaching roles.

SPED 8440 Teaching Children And Youth With Emotional Behavior Disorders
[3 credit hours (3, 0, 0)]
This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral Disorders/disturbances. Psycho-social educational best practices within the least restrictive environment are presented.

Term Offered: Spring

SPED 8470 Theory And Research: Autism
[3 credit hours (3, 0, 0)]
This course provides in-depth readings in the field of autism. The course includes intense study on two levels: (1) theoretical considerations and (2) treatment approaches pertinent to populations with autism.

SPED 8480 Teach Youth/Child With Autism
[3 credit hours (3, 0, 0)]
This course provides research based methodologies for understanding and teaching children and youth with autism. Psycho-Social Educational best practices within the least restrictive environment are presented.

SPED 8720 Advanced Language And Speech For Persons With Hearing Impairments
[3 credit hours (3, 0, 0)]
Clinical evaluation model in descriptive linguistics and interaction in the use of a process approach to developing language with children with hearing impairments. Includes relation of hearing impairment to language development.

SPED 8730 Synthesis Of Principles Of Educating Children With Hearing Impairments
[3 credit hours (3, 0, 0)]
Historical, Philosophical, psychological and social aspects of educating the hearing impaired. Factors affecting successful public school instruction is covered.

SPED 8740 Curriculum And Assessment Issues Of The Education Of Persons With Hearing Impairments
[3 credit hours (3, 0, 0)]
Principles of educational assessment and curriculum development for students with hearing impairment. Assessment and curriculum issues will be discussed as they relate to current research trends in hearing impairment.

SPED 8900 Independent Research In Special Education
[1-5 credit hours (0, 0, 0-5)]
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 8930 Seminars In Special Education
[1-5 credit hours (0, 0, 0-5)]
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: Summer, Fall

SPED 8940 Internship/Externship In Special Education
[1-8 credit hours (0, 0, 0-20)]
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 (0, 0, 0-24)]
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 (0, 0, 0-5)]
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 5440 Augmentative Communication Systems
[3 credit hours (3, 0, 0)]

SLP 6000 Advanced Practicum in Communication Disorders
[2 credit hours (0, 0, 6)]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or been 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
Term Offered: Spring, Summer, Fall

SLP 6001 Advanced Practicum in Communication Disorders II
[2 credit hours (0, 0, 2)]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or been 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 and SLP 6001

SLP 6010 Diagnostic Practicum in Communication Disorders
[2 credit hours (0, 0, 6)]
Provides a minimum of 30 hours supervised diagnostic practicum with a variety of communicatively disordered cases.
Corequisites: SLP 6100
Term Offered: Spring, Summer, Fall

SLP 6011 Diagnostic Practicum in Communication Disorders II
[2 credit hours (0, 0, 2)]
Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or been currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected. SLP 6010
Prerequisites: SLP 6010
Term Offered: Summer

SLP 6020 Audiological Practicum in Communication Disorders
[2 credit hours (0, 0, 5)]
Provides the advanced student with supervised practicum hours in the screening, impedance and pure tone threshold testing for audiological diagnosis.
Term Offered: Spring, Summer, Fall

SLP 6030 Research in Speech-Language Pathology
[3 credit hours (3, 0, 0)]
Early graduate course in research methods with emphasis on analysis of current research, application of single-subject research in clinic practicum, and development of research project.
Prerequisites: SLP 6010 (may be taken concurrently) or SLP 6020 (may be taken concurrently)
Term Offered: Spring, Summer, Fall

SLP 6100 Diagnosis of Speech And Language Disorders
[3 credit hours (3, 0, 0)]
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 through Adolescence
[6 credit hours (6, 0, 0)]
This course provides the conceptual framework for understanding language disorders in preschool through school-age children. Special emphasis is placed on application and theory of assessment as well as intervention strategies in private and school settings.
Term Offered: Spring, Fall

SLP 6300 Phonological And Articulatory Disorders
[3 credit hours (3, 0, 0)]
Advanced study of phonological and articulatory disorders including developmental apraxia. Focus on phonological differences in multilingual and multicultural 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 (5, 0, 0)]
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 linguistic deficits due to trauma and disease to central nervous systems.
Term Offered: Spring, Fall

SLP 6500 Motor Speech Disorders
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
Introduction to the study and application of assistive technology, including augmentative 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, Fall

SLP 6600 Voice and Resonance Disorders
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 6670 Voice Disorders
[3 credit hours (3, 0, 0)]

SLP 6700 Assessment And Remediation Of Fluency Disorders
[3 credit hours (3, 0, 0)]
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 6710 Counseling Skills for Speech-Language Pathologists
[3 credit hours (3, 0, 0)]
Provides an overview of the skills necessary to counsel people with communication disorders and their families. Topics include patient-centered practice, interviewing, information-giving, psychological sequelae of communication disorders, and family systems.

SLP 6720 Advanced Readings in Fluency Disorders
[3 credit hours (0, 0, 3)]
Reviews seminal and current research studies in fluency disorders. Topics include physiology, psychosocial effects of stuttering, evidence base for stuttering therapy, school-based stuttering therapy, and others based on student interests.

SLP 6730 Innovative Service Delivery in Stuttering
[3 credit hours (3, 0, 0)]
Explores innovative service delivery models in stuttering including intensive programs, telepractice, and group therapy. Students will deliver therapy to at least one client who stutters as part of the course.

SLP 6750 Professional Issues in Speech Language Pathology
[3 credit hours (3, 0, 0)]
This course will provide students with the opportunity to learn about specific issues related to working in a variety of professional settings.

SLP 6800 Aural Rehabilitation
[3 credit hours (3, 0, 0)]
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 6810 Facilitating Auditory Learning and Spoken Language for Children with Hearing Loss
[3 credit hours (0, 0, 3)]
The impact of universal newborn hearing screening, early fitting of hearing technology (digital hearing aids and/ or cochlear implants), and enrollment in comprehensive early intervention programs has created new opportunities for infants and toddlers with hearing loss to learn to listen and talk. In this course, students will learn the developmental processes that are the underpinning for audition and spoken language acquisition. Specific techniques, strategies, and teaching behaviors to develop listening and spoken language in young children who are deaf or hard of hearing will be demonstrated and explored.
Term Offered: Spring

SLP 6820 Hearing Technology
[3 credit hours (0, 0, 3)]
This course will orient speech-language pathology students to hearing technologies that assist persons with hearing impairment (hearing aids, assistive listening and alerting devices, and implantable technologies). The focus will be on providing auditory access to children for the purpose of developing listening and spoken language. Equipment will be demonstrated, current issues will be discussed, and students will be given opportunities to check and troubleshoot equipment.
Term Offered: Fall

SLP 6900 Independent Research In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
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: Summer

SLP 6930 Lang Lit Ac of Child Hear Loss
[3 credit hours (0, 0, 3)]
This course examines the relevant research, best practices, and intervention strategies for infants and children with hearing loss.
Term Offered: Spring

SLP 7000 Team Models and Ed Leadership
[3 credit hours (0, 0, 3)]
SLPs who work with children who are hearing impaired (HI) must work in collaboration educational professionals, parents, audiologists, and other medical professionals within a team-based model. This course will focus on the skills, knowledge and ethical practices essential to the provision of effective service coordination and teaming for SLPs who work in educational settings with children who are HI. Students will examine various models of teaming and consultation approaches and address issues related to supporting students’ educational achievement in educational settings.
Term Offered: Summer

SLP 6940 Independent Research In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
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: Summer, Fall

SLP 6920 Master's Research Project In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
The Master's project is an individually designed product.
Prerequisites: SLP 6930
SLP 6930 Seminars In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
Seminars will consider problems and provide advanced study in the field of Speech-Language Pathology. A student may register for more than one seminar during a graduate program.
Term Offered: Spring, Fall

SLP 6940 Internship In Speech-Language Pathology
[1-8 credit hours (0, 0, 0-8)]
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

SLP 6941 Internship in Speech-Language Pathology II
[4 credit hours (0, 0, 4)]
Provides the advanced graduate student with supervised practicum experiences at an off-campus site. This will be the second of three externships completed by the student, with the expectation of students having more time scheduled and more clinical hours across each externship course.
Prerequisites: SLP 6940

SLP 6942 Internship in Speech-Language Pathology III
[6 credit hours (0, 0, 6)]
Provides the graduate student with supervised practicum experiences at an off-campus site. This is the third internship in a sequence.
Prerequisites: SLP 6940 and SLP 6941

SLP 6960 Master Research Thesis In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
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.
Prerequisites: SLP 6930
Term Offered: Spring, Summer, Fall

SLP 6990 Independent Study In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Speech-Language Pathology program. Individual meetings with sponsoring faculty are held.
Term Offered: Spring, Summer, Fall

SLP 7610 Orientation to Interprofessional Teaming
[1 credit hour (0, 0, 1)]
Orientation to the Graduate Certificate in Teaming in Early Childhood. Focus on individual competencies needed to work collaboratively to meet the needs of young children with disabilities and their families.
Prerequisites: SPED 5270
Term Offered: Summer

SLP 7620 Working Effectively With Team Members
[1 credit hour (0, 0, 1)]
This second seminar in the Graduate Certificate in Teaming in Early Childhood focuses on skills and policies that promote best practices in teaming to support young children with disabilities.
Prerequisites: SLP 7610
Term Offered: Fall

SLP 7630 Evidence-Based Practice and Innovation in Interprofessional Teaming
[1 credit hour (0, 0, 1)]
This third seminar in the Graduate Certificate in Teaming in Early Childhood provides students the opportunity to reflect on their practicum experiences in teaming to support young children with disabilities.
Prerequisites: SLP 7620
Corequisites: SLP 7640
Term Offered: Spring

SLP 7640 Practicum in Interprofessional Teaming
[2 credit hours (0, 0, 2)]
The practicum is provides an opportunity to engage in interprofessional teaming in order to provide integrated services to young children with special needs in an inclusive setting.
Prerequisites: SLP 5620
Corequisites: SLP 5630
Term Offered: Summer

SLP 8000 Advanced Practicum In Communication Disorders
[2 credit hours (0, 0, 5)]
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: Summer

SLP 8010 Diagnostic Practicum In Communication Disorders
[2 credit hours (0, 0, 5)]
Provides a minimum of 30 hours supervised diagnostic practicum with a variety of communicatively disordered cases.
Corequisites: SLP 8100
Term Offered: Summer

SLP 8020 Audiological Practicum In Communication Disorders
[2 credit hours (0, 0, 5)]
Provides the advanced student with supervised practicum hours in the screening, impedance and pure tone threshold testing for audiological diagnosis.

SLP 8100 Diagnosis Of Speech And Language Disorders
[3 credit hours (3, 0, 0)]
Detailed analysis of formal and informal instruments and procedures designed to evaluate speech and language disorders.

SLP 8210 Preschool Language Disorders
[3 credit hours (3, 0, 0)]
The conceptual framework for understanding language disorders in young children. Application and theory of assessment and intervention strategies will be described and discussed.

SLP 8220 Language Disorders In School-Age Children
[2 credit hours (0, 0, 2)]
The conceptual framework for understanding language disorders in school-age children with special emphasis on language assessment and language interventions in school settings.

SLP 8300 Phonological And Articulatory Disorders
[3 credit hours (3, 0, 0)]
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.
SLP 8400 Neurological Disorders: Aphasia
[3 credit hours (3, 0, 0)]
Advanced course in deficits due to neurological alterations resulting in aphasia. Formal and informal assessment procedures for the diagnosis of aphasia as well as techniques and functional strategies for communicative compensation provide the focus of the course.

SLP 8450 Neurological Disorders: Brain Injury And Dementia
[2 credit hours (2, 0, 0)]
Course in cognitive and linguistic deficits due to trauma and disease to central nervous system. Course focuses on identification and intervention in communication disorders as the result of acquired brain injury/disease. Traumatic brain injury, right hemisphere damage and dementia are addressed.

SLP 8500 Motor Speech Disorders
[3 credit hours (3, 0, 0)]
Adult apraxia and dysarthrias are discussed in relation to neurological organization, disorders and speech characteristics.

SLP 8550 Augmentative And Alternative Communication
[2 credit hours (2, 0, 0)]
The study and application of assistive communication technology for persons who are nonspeaking. The course includes characteristics of ACC consumers, design features of augmentative communication devices, assessment strategies to choose a system and intervention strategies to facilitate use of the ACC system.

SLP 8600 Voice Disorders: Diagnosis And Treatment
[3 credit hours (3, 0, 0)]
Advanced course in the evaluation and treatment of voice disorders. Major voice disorders in children and adults are emphasized.

SLP 8650 Dysphagia And Orpharyngeal Disorders
[2 credit hours (2, 0, 0)]
Evaluation and intervention procedures for individuals with communication problems related to structural impairments of the oral cavity and pharynx.

SLP 8670 Voice Disorders
[3 credit hours (3, 0, 0)]

SLP 8700 Assessment And Remediation Of Fluency Disorders
[3 credit hours (3, 0, 0)]
An advanced course to develop skills in the assessment and remediation of fluency disorders with special emphasis on current trends in stuttering therapy.

SLP 8800 Aural Rehabilitation
[3 credit hours (3, 0, 0)]
Advanced care and training in the use of individual and group assistive listening devices, auditory trainers and other aids to augment hearing. Methods for using residual hearing and contextual factors to augment technology is addressed.

SLP 8930 Seminars In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
Seminars will consider problems and provide advanced study in the field of Speech-Language Pathology. A student may register for more than one seminar during a graduate program.

SLP 8940 Internship In Speech-Language Pathology
[1-8 credit hours (0, 0, 0-8)]
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.

SLP 8950 Master Research Thesis In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
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.

Prerequisites: SLP 6930

SLP 8960 Master Research Thesis In Speech-Language Pathology
[1-5 credit hours (0, 0, 0-5)]
Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Speech-Language Pathology program. Individual meetings with sponsoring faculty are held.

Term Offered: Summer
SURGERY (SURG)

SURG 6610 Journal Paper Review in Surgery
[0-4 credit hours (0-4, 0, 0)]
Weekly assessment and critical review of the literature devoted to surgical science. Emphasis will be placed on structure and content of literature with the goal of developing the student's ability to evaluate validity. May be repeated for credit.
Term Offered: Spring, Fall

SURG 6810 Current Topics in Surgery II
[0-4 credit hours (0-4, 0, 0)]
Lecture and/or seminar course in topics of current interest in general surgery with special emphasis on the fundamentals of life under normal, experimental, or pathological conditions. Will present and moderate the discussion of original and on-going research publications and studies.
Term Offered: Spring, Fall
THEORY AND SOCIAL FOUNDATIONS (TSOC)

TSOC 5100 Group Processes In Education
[3 credit hours (3, 0, 0)]
Examines intrapersonal and interpersonal principles of high performing teams, meaningful relationships, and being an effective leader and member of groups. Real-life projects will be designed, implemented and evaluated.
Term Offered: Spring, Summer, Fall

TSOC 5110 Modern Educational Controversies
[3 credit hours (3, 0, 0)]
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 5190 Summer Institute On Diversity In Education
[3 credit hours (0, 0, 3)]
School personnel collaborate with persons from higher education, the community, and scholars who have created model multicultural/urban education programs to learn new ways of teaching and learning among diverse populations.

TSOC 5200 Sociological Foundations Of Education
[3 credit hours (3, 0, 0)]
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 Multicultural Non-Sexist Education
[3 credit hours (3, 0, 0)]
Examines how race, class, gender, ethnicity and disability intersect with power, culture, knowledge and ideology in American schools to influence the lives of students and teachers in a multicultural society.
Term Offered: Spring, Summer, Fall

TSOC 5230 Intergroup And Intercultural Education
[3 credit hours (3, 0, 0)]
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, Summer, Fall

TSOC 5300 Philosophy And Education
[3 credit hours (3, 0, 0)]
Exploring the nature of philosophic inquiry in education and examining competing traditions in the West, particularly in the United States. A distinction between education and schooling will be drawn.
Term Offered: Spring, Summer, Fall

TSOC 5400 History Of Schooling & Teaching In The U.s.
[3 credit hours (3, 0, 0)]
Evolving role of schooling and teaching in the US, using history to reflect on the relationship of schooling to other social institutions, groups of people and the process of social change.
Term Offered: Fall

TSOC 5500 Anthropology and Education
[3 credit hours (3, 0, 0)]
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 Pedagogy
[3 credit hours (0, 0, 3)]
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 5950 Workshop In Educational Theory And Social Foundations
[3 credit hours (0, 0, 3)]
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.
Term Offered: Spring

TSOC 6000 Women, Culture And Pedagogy
[3 credit hours (3, 0, 0)]
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 (3, 0, 0)]
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 History Of Socio-Political Issues In School-state Relations
[3 credit hours (3, 0, 0)]
An examination of the historical, legal, sociological interaction between state and schooling in US, emphasizing both religious/non-religious issues. These concerns are compared and analyzed with respect to other countries.
Prerequisites: TSOC 5200 or TSOC 5400 or TSOC 7200 or TSOC 7400

TSOC 6190 Seminar In Educational Theory/Social Foundations
[3 credit hours (0, 0, 3)]
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 6220 Problems And Issues In Multicultural Education
[3 credit hours (3, 0, 0)]
2Application of theoretical assumptions presented in TSOC 5210/7210 to US schools and classrooms, with particular attention given to program and curriculum issues, teachers and teaching policies, practices and procedures.
Prerequisites: TSOC 5210 or TSOC 7210
**Prerequisites:** problems, issues and reform initiatives. United States, including historical and critical analyses of current development and dynamics of schooling in urban centers across the world.

**TSOC 6240 Sociological Analyses Of Urban Education**
[3 credit hours (3, 0, 0)]
Development and dynamics of schooling in urban centers across the United States, including historical and critical analyses of current problems, issues and reform initiatives.

**Term Offered:** Spring

**TSOC 6310 Major Educational Theorists**
[3 credit hours (3, 0, 0)]
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.

**TSOC 6320 Education And The Democratic Ethic**
[3 credit hours (3, 0, 0)]
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 or TSOC 5310 or TSOC 6400 or TSOC 7200 or TSOC 7220

**Term Offered:** Fall

**TSOC 6330 THE ETHICS OF WAR AND PEACE AND EDUCATION**
[3 credit hours (0, 0, 3)]
The purpose of this seminar is to explore the ethics of war and peace and its implications for the moral and civic education of democratic citizens.

**Term Offered:** Spring

**TSOC 6340 Human Rights Education**
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 6960 Master’s Thesis In Educational Theory And Social Foundations**
[1-3 credit hours (0, 0, 0-3)]
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 (0, 0, 0-3)]
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 (0, 0, 0-3)]
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 Group Processes In Education**
[3 credit hours (3, 0, 0)]
Examines intrapersonal and interpersonal principles of high performing teams, meaningful relationships, and being an effective leader and member of groups. Real-life projects will be designed, implemented and evaluated.

**Term Offered:** Spring, Summer, Fall

**TSOC 7110 Modern Educational Controversies**
[3 credit hours (3, 0, 0)]
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 7190 Summer Institute On Diversity In Education**
[3 credit hours (0, 0, 3)]
School personnel collaborate with persons from higher education, the community, and scholars who have created model multicultural/urban education programs to learn new ways of teaching and learning among diverse populations.

**TSOC 7200 Sociological Foundations Of Education**
[3 credit hours (3, 0, 0)]
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 Multicultural Non-Sexist Education**
[3 credit hours (3, 0, 0)]
Examines how race, class, gender, ethnicity, and disability intersect with power, culture, knowledge and ideology in American schools to influence the lives of students and teachers in a multicultural society.

**Term Offered:** Spring, Summer, Fall

**TSOC 7230 Intergroup And Intercultural Education**
[3 credit hours (3, 0, 0)]
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, Summer, Fall
TSOC 7300 Philosophy And Education
[3 credit hours (3, 0, 0)]
Exploring the nature of philosophic inquiry in education and examining competing traditions in the West, particularly in the United States. A distinction between education and schooling will be drawn.
Term Offered: Summer, Fall

TSOC 7400 History Of Schooling & Teaching In The U.s.
[3 credit hours (3, 0, 0)]
Evolving role of schooling and teaching in the US, using history to reflect on the relationship of schooling to other social institutions, groups of people and the process of social change.
Term Offered: Fall

TSOC 7500 Anthropology and Education
[3 credit hours (0, 0, 3)]
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 Pedagogy
[3 credit hours (0, 0, 3)]
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 areas of peace education.
Term Offered: Summer, Fall

TSOC 7950 Workshop In Educational Theory And Social Foundations
[3 credit hours (0, 0, 3)]
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.

TSOC 8000 Women, Culture, And Pedagogy
[3 credit hours (0, 0, 3)]
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 8120 International Education
[3 credit hours (3, 0, 0)]
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 History Of Socio-Political Issues In School-state Relations
[3 credit hours (3, 0, 0)]
An examination of the historical, legal, sociological interaction between state and schooling in US, emphasizing both religious/non-religious issues. These concerns are compared and analyzed with respect to other countries.
Prerequisites: TSOC 5200 or TSOC 5400 or TSOC 7200 or TSOC 7400

TSOC 8150 CULTURAL PERSPECTIVES IN LEARNING AND DEVELOPMENT
[3 credit hours (0, 0, 3)]
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 8180 Interdisciplinary Seminar In Educational Psychology, Research, And Social Foundations
[1 credit hour (0, 0, 1)]
The proseminar will enable doctoral students to improve their understanding of the research process. Students will learn to ask research questions, choose alternative methodologies and interpret the validity of conclusions.

TSOC 8190 Seminar In Educational Theory/Social Foundations
[3 credit hours (0, 0, 3)]
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 8220 Problems And Issues In Multicultural Education
[3 credit hours (3, 0, 0)]
2Application of theoretical assumptions presented in TSOC 5210/7210 to US schools and classrooms, with particular attention given to program and curriculum issues, teachers and teaching policies, practices and procedures.
Prerequisites: TSOC 5210 or TSOC 7210

TSOC 8240 Sociological Analyses Of Urban Education
[3 credit hours (3, 0, 0)]
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 or TSOC 5210 or TSOC 7200 or TSOC 7210
Term Offered: Spring, Summer

TSOC 8310 Major Educational Theorists
[3 credit hours (3, 0, 0)]
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

TSOC 8320 Education And The Democratic Ethic
[3 credit hours (3, 0, 0)]
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 or TSOC 5300 or TSOC 5400 or TSOC 7200 or TSOC 7300 or TSOC 7400
Term Offered: Fall

TSOC 8330 THE ETHICS OF WAR AND PEACE AND EDUCATION
[3 credit hours (0, 0, 3)]
The purpose of this seminar is to explore the ethics of war and peace and its implications for the moral and civic education of democratic citizens.
Term Offered: Spring
TSOC 8340 Human Rights Education
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 Justice and Educational Policy
[3 credit hours (0, 0, 3)]
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 (0, 0, 3)]
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 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 (0, 0, 3)]
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 8990 Independent Study in Educational Theory and Social Foundations
[1-6 credit hours (0, 0, 0-6)]
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
UROLOGY (UROL)

UROL 6400 Readings in Immunology
[0-3 credit hours (0-3, 0, 0)]
Selected readings in the field of immunology. Emphasis will be placed on the historical development of the field and establishing a working model of the immune system for the student. May be repeated for credit.
Term Offered: Spring

UROL 6500 Seminar Urological Science I
[2 credit hours (0, 0, 0)]
Literature review and critical analysis of subspecialty areas within the field of urology, pediatric urology, and oncology. May be repeated for credit.
Term Offered: Fall

UROL 6550 Jrnl Review Urologic Science
[1 credit hour (0, 0, 1)]
A weekly assessment and critical review of the literature devoted to urological science. Emphasis will be placed on structure and content of the literature with the goal of developing the student’s ability to evaluate literature validity. May be repeated for credit.
Term Offered: Spring, Fall

UROL 6560 Readings in Urologic Science
[2 credit hours (0, 0, 2)]
Selected readings in the field of urological science. Emphasis will be placed on the historical development of different treatment modalities. May be repeated for credit.
Term Offered: Spring, Fall

UROL 6730 Research Urological Science I
[2 credit hours (0, 2, 2)]
The student and instructor will agree on a program of study that will enable the student to achieve his/her objectives. May be repeated for credit.
Term Offered: Fall

UROL 6900 Ind St:Urol Transplantation
[0-4 credit hours (0, 0, 0)]
The student and instructor will agree on a program of study to enable the student to achieve objectives including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring

UROL 6910 Ind St:Urol Surg Oncology
[0-4 credit hours (0, 0, 0)]
The student and instructor will agree on a program of study to enable the student to achieve his/her objectives including theoretical and experimental work. May be repeated for credit.
Term Offered: Fall

UROL 6920 Ind St:Surg Infertility
[0-4 credit hours (0, 0, 0)]
Student and instructor will agree on a program of study to enable the student to achieve objectives including theoretical and experimental work. May be repeated for credit.
Term Offered: Fall

UROL 6930 IndSt:Urol Surg Peds Urology
[0-4 credit hours (0, 0, 0)]
The student and instructor will agree on a program of study that will enable the student to achieve his/her objectives including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring
WOMEN AND GENDER STUDIES (WGST)

WGST 5880 Queer and Sexuality Theories - WAC
[3 credit hours (0, 0, 3)]
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 hyperabstraction of “classic 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 1990’s.
Term Offered: Spring

WGST 5980 Special Topics Gender
[3 credit hours (3, 0, 0)]
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
[4 credit hours (0, 0, 4)]
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 (0, 0, 3)]
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 (0, 0, 3)]
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 (0, 0, 1-4)]
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 (0, 0, 1-4)]
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
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