

# DEPARTMENT OF PHARMACY PRACTICE

Martin Ohlinger, Chair

The Department of Pharmacy Practice consists of 23 faculty members in the areas of Pharmacy Practice, Health Outcomes and Socioeconomic Sciences, Cosmetic Science and Formulation Design, Pharmaceutics and Industrial Pharmacy. The faculty of the department represent a diverse group of interests and activities that lead to the accomplishment of the mission of the College and University. In addition, over 300 community-based faculty assist the department in the teaching mission by providing training sites. The Department faculty practice in a variety of healthcare settings.

## Degrees Offered

- BSPS in Cosmetic Science and Formulation Design (PCOS) (<https://catalog.utoledo.edu/undergraduate/pharmacy-pharmaceutical-sciences/pharmacy-practice/bsps-cosmetic-science-formulation-design/>)
- BSPS in Drug Discovery and Design (<https://catalog.utoledo.edu/undergraduate/pharmacy-pharmaceutical-sciences/pharmacy-practice/bsps-drug-discovery-and-design/#text>)
- Cosmetic Science Minor (<https://catalog.utoledo.edu/undergraduate/pharmacy-pharmaceutical-sciences/pharmacy-practice/cosmetic-science-minor/>)

### PHM 3000 Integrated Pharmaceutical and Clinical Sciences 1

[6 credit hours]

An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis and treatments. The course focuses on clinical laboratory tests and monitoring, hypertension, hyperlipidemia, diabetes and endocrine related disorders.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D-

**Corequisites:** PPHR 3460

**Term Offered:** Spring

### PHM 3100 Cardiology I Hypertension and Hyperlipidemia

[2 credit hours]

An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of Hypertension and Hyperlipidemia.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D-

**Corequisites:** PPHR 3460

### PHM 3120 Diabetes Endocrine

[3 credit hours]

An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of Diabetes and Endocrine related disorders.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D-

**Corequisites:** PPHR 3460

### PHM 3700 Career Planning Strategies

[1 credit hour]

An applied course for which students learn the fundamentals of career exploration, job searching, and professionalism as it pertains to the pharmaceutical sciences industry.

**Term Offered:** Spring, Fall

### PHM 4000 Integrated Pharmaceutical and Clinical Sciences 2

[8 credit hours]

An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of immunologic disorders, pharmacokinetic considerations and infectious diseases.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D- and PHCL 4160 with a minimum grade of D- and PHM 3000 with a minimum grade of D-

**Corequisites:** PPHR 4350

**Term Offered:** Fall

### PHM 4010 Immunology

[3 credit hours]

An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, and Pharmacotherapeutics, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of immune system and immune based disease and hypersensitivity.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D- and PPHR 3060 with a minimum grade of D-

**Corequisites:** PPHR 4350

### PHM 4030 Infectious Disease

[4 credit hours]

An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, and Pharmacotherapeutics, to study etiology, pathophysiology, clinical presentation, diagnosis and treatment of Infectious Diseases.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D- and PPHR 3060 with a minimum grade of D-

**Corequisites:** PPHR 4350, PPHR 4470

### PHM 4100 Psychiatry and Neurology

[3 credit hours]

An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of neurologic and psychiatric disorders.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D- and PPHR 3060 with a minimum grade of D-

**Corequisites:** PPHR 4360

**PHM 4120 Pain and Substance Abuse**

[2 credit hours]

An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, and Pharmacotherapeutics, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of acute and chronic pain and substance use disorders.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D- and PHPR 3060 with a minimum grade of D-

**Corequisites:** PHPR 4360

**PHM 4140 Hematology**

[1.5 credit hours]

An integrated course that includes Pharmacology and Pharmacotherapeutics, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of Hematologic and related disorders.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D- and PHPR 3060 with a minimum grade of D-

**Corequisites:** PHPR 4360

**PHM 4160 Pulmonary**

[1.5 credit hours]

An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, and Pharmacotherapeutics, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of pulmonary diseases.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D- and PHPR 3060 with a minimum grade of D-

**Corequisites:** PHPR 4360

**PHM 4200 Integrated Pharmaceutical and Clinical Sciences 3**

[8 credit hours]

An integrated course that includes Pharmacology, Medicinal and Physiological Chemistry, Pharmacokinetics and Pharmacy Practice, to study etiology, pathophysiology, clinical presentation, diagnosis, and treatment of pulmonary hematologic, psychiatric, neurologic and pain and substance abuse disorders.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D- and PHM 3000 with a minimum grade of D-

**Corequisites:** PHPR 4360

**Term Offered:** Spring

**PHM 4780 Internship in Drug Discovery and Design**

[3 credit hours]

An experiential course for which students acquire practical knowledge through hands-on experience in an area of pharmaceutical sciences by working in an academic, private, or government laboratory or professional site.

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

**PHPR 1000 Orientation**

[1 credit hour]

Lectures and small group discussions include University, Freshman Orientation, FYI subjects, plus introductory elements of Pharmacy professional culture.

**Term Offered:** Fall

**PHPR 2000 Introduction to Pharmacy and Pharmaceutical Sciences**

[1 credit hour]

This course is designed for pre-pharmacy students pursuing a degree in pharmacy or pharmaceutical sciences to connect with the college, explore career opportunities, self-evaluate skills, and career goals, and learn the basics of certain medical terminology, medications, personal care products, and disease states to assist in the understanding and motivation of pharmacy and pharmacy science-based coursework.

**Term Offered:** Fall

**PHPR 2020 Careers in Cosmetic Science**

[1 credit hour]

An introductory course to careers in the cosmetic industry with interactive keynote guest speakers.

**Term Offered:** Spring

**PHPR 2040 Introduction to Cosmetic Science**

[1 credit hour]

An introductory course about the structure of the cosmetic industry, careers, product categories, and regulatory considerations which govern the industry.

**Term Offered:** Spring, Fall

**PHPR 3000 Pharmaceutics and Dosage Form Design**

[5 credit hours]

The lectures and labs in Pharmaceutics and Dosage Form Design have an overarching theme of drug product knowledge. Topics for the lectures and labs include drug product design, pharmaceutical calculations, and an emphasis on contemporary pharmacy compounding.

**Term Offered:** Fall

**PHPR 3010 Pharmaceutical Calculations**

[2 credit hours]

This course is intended to present the principles involved in solving any mathematical problem which may be encountered in the practice of pharmacy-logical thought processes will be used.

**Term Offered:** Fall

**PHPR 3020 Pharmaceutics I**

[3 credit hours]

A lecture introduction to the principles, theory, and processes involved in the manufacture and compounding of fundamental classes of dosage forms.

**Corequisites:** PHPR 3010

**Term Offered:** Fall

**PHPR 3030 Pharmaceutics II**

[3 credit hours]

A continuation of PHPR 3020 as a lecture to the principles, theory, and processes involved in the manufacture and compounding of fundamental classes of dosage forms.

**Prerequisites:** PHPR 3020 with a minimum grade of D- and PHPR 3010 with a minimum grade of D-

**Term Offered:** Spring

**PHPR 3040 Cosmetic Ingredients**

[2 credit hours]

Physicochemical and cosmetic properties, function, and use of the various ingredients used in cosmetics and personal care products. Students learn why these ingredients are present in products and how to select them for a given formulation.

**Prerequisites:** CHEM 1230 with a minimum grade of D- and CHEM 1240 with a minimum grade of D-

**Term Offered:** Spring, Fall

**PHPR 3050 Interprofessional Approach to Patient Care**

[1 credit hour]

This course is designed to prepare all health professions students to deliberately and constructively work together with the common goal of building a safer, better patient-centered and community/population-oriented U.S. health care system. Students will be assigned to small-group interprofessional teams and will interact and collaborate with students from other healthcare professions.

**Term Offered:** Fall

**PHPR 3060 Introduction to Patient Care**

[1 credit hour]

This course will introduce concepts relative to the patient care process and the understanding of the pathophysiology and pharmacotherapy of disease states. The course will discuss commonly used clinical laboratory tests and how to interpret and apply their results to improve patient care, identify patient specific factors that impact medication dosing.

**Prerequisites:** MBC 3310 with a minimum grade of D- and PHCL 3700 with a minimum grade of D-

**Corequisites:** PHPR 3460

**Term Offered:** Spring

**PHPR 3070 Pharmaceuticals and Pharmaceutical Technology I**

[4 credit hours]

Course considers the principles and thought processes involved in solving pharmacy-related mathematical problems and the theory and processes involved in the manufacture and extemporaneous compounding of dosage forms.

**Term Offered:** Fall

**PHPR 3080 PPD-2**

[4 credit hours]

Further exploration of the principles, theory and processes involved in the development and preparation of parenteral, ophthalmic and other non-oral drug delivery systems.

**Term Offered:** Spring

**PHPR 3100 Emulsion Science**

[1 credit hour]

Emulsion and aligned colloidal phenomena is at the core of most cosmetic and personal care formulation technology. This course will provide an overview of emulsion formulation basics including reversible and irreversible formulation changes and emulsion stabilization techniques.

**Prerequisites:** PHPR 3040 with a minimum grade of D-

**PHPR 3110 Pharmaceutics Lab I**

[1 credit hour]

A laboratory introduction to the principles, theory, and processes involved in the manufacture and compounding of fundamental classes of dosage forms.

**Corequisites:** PHPR 3010, PHPR 3020

**PHPR 3120 Pharmaceutics Lab II**

[1 credit hour]

A laboratory course that follows PHPR 3110 that introduces principles, theory, and processes involved in the manufacture and compounding of various classes of dosage forms.

**Corequisites:** PHPR 3030

**Term Offered:** Spring

**PHPR 3130 PPT-1**

[2 credit hours]

Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of attention deficit hyperactivity disorder, sleep disorders, acid-base, fluid & electrolytic imbalances, pain and substance abuse.

**Corequisites:** MBC 3310, PHCL 3700

**Term Offered:** Fall

**PHPR 3140 PPT-2**

[2 credit hours]

Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of endocrine disorders and reproduction.

**Prerequisites:** PHPR 3130 with a minimum grade of C

**Corequisites:** MBC 3320, MBC 3560, PHCL 3720

**Term Offered:** Spring

**PHPR 3150 Essentials of U.S. Healthcare Delivery and Pharmacoeconomic Evaluation**

[2 credit hours]

This course provides an in-depth understanding of the essential components of healthcare delivery in the United States, with a focus on pharmacoeconomic evaluation.

**Term Offered:** Spring

**PHPR 3240 Cosmetic Ingredients Laboratory**

[1 credit hour]

Laboratory introduction to the cosmetic ingredients and active ingredients learned in Cosmetic Ingredients lecture course. Demonstrations and laboratory experiments to prepare students for product formulation courses.

**Corequisites:** PHPR 3040

**Term Offered:** Fall

**PHPR 3250 Introduction to Self Care**

[1 credit hour]

The course will provide an introduction to the over-the-counter marketplace and discussion of the pharmacist's patient care process. Special emphasis will be placed on how pharmacists should help patients safely and effectively treat common medical problems.

**Prerequisites:** PHPR 3450 with a minimum grade of D- and PHCL 3700 with a minimum grade of D-

**Corequisites:** PHPR 3460

**Term Offered:** Spring

**PHPR 3260 PHCAD-1**

[2 credit hours]

Description and analysis of the organization, financing and delivery of healthcare in the U.S.. Development of communication skills for pharmacists to function optimally in the system is emphasized.

**Term Offered:** Spring, Fall**PHPR 3300 Commonly Prescribed Meds and Med Term 1**

[1 credit hour]

This course introduces students to commonly prescribed medications and medical terminology.

**Term Offered:** Fall**PHPR 3310 Introduction to Pharmacy Law**

[1 credit hour]

The purpose of this course is to introduce students to laws that regulate the practice of pharmacy. Federal drug laws and specific state laws that regulate the filling and dispensing of prescriptions will be reviewed and applied.

**Term Offered:** Spring**PHPR 3450 Pharmacy Skills Development-1**

[2 credit hours]

This course is designed to introduce students to the Pharmacists' Patient Care Process as it is applied to the Community Pharmacy Setting in order to prepare them for their Community Pharmacy Introductory Pharmacy Practice Experiences.

**Term Offered:** Fall**PHPR 3460 Pharmacy Skills Development-2**

[2 credit hours]

Building on competencies from prerequisite courses, this course is designed to enhance skills in the Pharmacists' Patient Care Process (PPCP) as they are applied to the Community Pharmacy Setting.

**Prerequisites:** PHPR 3450 with a minimum grade of D- or PHPR 5450 with a minimum grade of D-

**Term Offered:** Spring**PHPR 3470 Pharmacokinetics**

[3 credit hours]

This course will provide the theoretical basis and clinical application of pharmacokinetics as relates to drug dosing, absorption, distribution, biotransformation and excretion.

**PHPR 3500 Cosmetic Laws and Regulations**

[1 credit hour]

Overview of the United States cosmetic laws and regulations, legal definitions, and product safety will be taught. Topics will include how cosmetics are regulated in the US, labeling requirements, product compliance and safety concerns. Knowledge to market cosmetic products with regulatory compliance in the US will be provided.

**Prerequisites:** PHPR 3040 (may be taken concurrently) with a minimum grade of D-

**Term Offered:** Fall**PHPR 3600 The Science of Color in Cosmetics**

[1 credit hour]

An in-depth course, which gives students a full overview and understanding of color vision, dimensions of color description and measurement scales. The chemistry and structure of color additives used in cosmetics and personal care products will be covered along with a comprehensive review of regulations and their history in the US. The course will also introduce formulating and manufacturing concepts that students need to consider when working with colors. A group project will be required and will be presented to the entire class.

**Prerequisites:** PHPR 3040 with a minimum grade of D-

**Term Offered:** Spring**PHPR 3620 Cosmetic and Fragrance Product Development**

[1 credit hour]

An in-depth course aimed at giving students a full overview and understanding of the product development process to create cosmetic and fragrance products. Students will learn the necessary strategies and tools, as well as implement them to create a new product in a workshop format. The class will focus on topics such as ideation, competitive and market analysis, development, and the interdepartmental teamwork required to successfully launch a product. A group project will be required and will be presented to the entire class.

**Corequisites:** PHPR 3040

**Term Offered:** Fall**PHPR 3920 Introductory Pharmacy Practice Experience I**

[1 credit hour]

First professional year course designed to enhance professional growth through an introduction to clinical skill development and direct patient care activities within institutional and community pharmacy practice settings. Prerequisite: Admission into the Pharm.D. Program.

**Term Offered:** Spring, Summer, Fall**PHPR 3930 Introductory Pharmacy Practice Experience 2**

[1 credit hour]

First professional year course designed to enhance professional growth through an introduction to clinical skill development and direct patient care activities within institutional and community pharmacy practice settings. Prerequisite: Admission into the Pharm.D Program.

**Prerequisites:** PHPR 3920 with a minimum grade of C or PHPR 5920 with a minimum grade of C

**Term Offered:** Spring**PHPR 4050 Pharmacy Skills Development-3**

[2 credit hours]

This course will enhance skills in interpersonal communication with emphasis on application of one-to-one communication and patient counseling. Also includes the development of skills in the delivery of immunizations and medication therapy management (MTM).

**Prerequisites:** PHPR 3460 with a minimum grade of D-

**PHPR 4070 PPD-3**

[3 credit hours]

Interpersonal communication with emphasis upon application of one-to-one communication and patient counseling. Instruction in the broad dimension of professional pharmacy practice and responsibility for providing pharmaceutical care, and use of drug information resources, and provision of drug information.

**Prerequisites:** PHPR 3070 with a minimum grade of C

**Term Offered:** Fall

**PHPR 4080 PPD-4**

[3 credit hours]

Course enhances professional development to meet specific patient and health care practitioner needs. Instruction includes effective literature analysis, presentation of care plans, and pharmacy jurisprudence.

**Prerequisites:** PHPR 4070 with a minimum grade of C

**Corequisites:** PHPR 4140, PHPR 4330

**Term Offered:** Spring

**PHPR 4130 PPT-3**

[4 credit hours]

Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of immune, renal and rheumatologic disorders and transplantation.

**Prerequisites:** PHPR 3140 with a minimum grade of C and MBC 3800 with a minimum grade of C

**Corequisites:** PHCL 4700

**Term Offered:** Fall

**PHPR 4140 PPT-4**

[4 credit hours]

Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of immunology and infectious diseases

**Prerequisites:** MBC 3800 with a minimum grade of C

**Corequisites:** MBC 4300, PHCL 4720

**Term Offered:** Spring

**PHPR 4160 Pharmacokinetics**

[3 credit hours]

Theoretical basis and clinical application of pharmacokinetics as relates to drug dosing, absorption, distribution, biotransformation, and excretion.

**Term Offered:** Spring, Fall

**PHPR 4220 Patient Centered Care**

[2 credit hours]

This course focuses on learning various aspects of Patient Centered Care including: Medication Therapy Management (MTM) services, Motivational Interviewing, Patient Assessment, and Cultural Competence.

**Corequisites:** PHPR 4350

**Term Offered:** Fall

**PHPR 4270 Health Systems**

[1.5 credit hours]

This course will provide an overview of the organization, financing and delivery of healthcare in the U.S.

**Term Offered:** Spring

**PHPR 4300 Commonly Prescribed Meds and Med Term II**

[1 credit hour]

This course introduces students to commonly prescribed medications and medical terminology.

**Prerequisites:** PHPR 3300 with a minimum grade of D-

**Corequisites:** PHPR 4350

**Term Offered:** Fall

**PHPR 4330 RESEARCH DESIGN AND DRUG LITERATURE EVALUATION 1**

[2 credit hours]

Concepts of research design, statistical analysis, literature evaluation and evidence based medicine are introduced and integrated in a manner that depicts their practical relevance to pharmacy practice.

**Corequisites:** PHPR 4080

**Term Offered:** Spring

**PHPR 4350 Pharmacy Skills Development - 3**

[2 credit hours]

Building on competencies from prerequisite courses, this course is designed to enhance skills in the Pharmacists' Patient Care Process (PPCP) as they are applied to the Community and Ambulatory Care Pharmacy settings.

**Prerequisites:** PHPR 3460 with a minimum grade of D-

**Corequisites:** PHPR 4220

**Term Offered:** Fall

**PHPR 4360 Pharmacy Skills Development - 4**

[2 credit hours]

Building on competencies from prerequisite courses, this course is designed to enhance skills in the Pharmacists' Patient Care Process (PPCP) as they are applied to the Institutional Pharmacy setting.

**Prerequisites:** PHPR 4350 with a minimum grade of D- and PHPR 4530 with a minimum grade of D- or PHPR 6540 with a minimum grade of D-

and PHPR 6350 with a minimum grade of D-

**Term Offered:** Spring

**PHPR 4470 Applied Clinical Pharmacokinetics Primer**

[1 credit hour]

This course is a discussion of pharmacokinetic concepts which are commonly utilized in therapeutic drug monitoring and clinical application.

**Prerequisites:** PHPR 3470 with a minimum grade of D-

**Corequisites:** PHM 4030

**PHPR 4520 PHCAD-2**

[2 credit hours]

This course is to introduce students to the administrative sciences (marketing/management, etc.) and their respective roles in the provision of pharmaceutical care.

**Prerequisites:** PHPR 3260 with a minimum grade of C

**Term Offered:** Spring

**PHPR 4530 Evidence Based Medicine 1**

[3 credit hours]

This course introduces the principles and practice of evidence based medicine (EBM) in guiding clinical decision making in pharmacy practice.

**Prerequisites:** MATH 2640 with a minimum grade of D- or MATH 2600 with a minimum grade of D-

**Term Offered:** Fall

**PHPR 4540 Evidence Based Medicine 2**

[2 credit hours]

This course expands upon the principles and practice of evidence based medicine (EBM) in guiding clinical decision making in pharmacy practice. Students will develop their formal oral presentation skills.

**Prerequisites:** PHPR 4530 with a minimum grade of D-

**Corequisites:** PHPR 4360

**Term Offered:** Spring

**PHPR 4550 Analysis Of The Pharmaceutical Environment**

[3 credit hours]

A theoretical and practical examination of the pharmaceutical environment and drug distribution system using the science of marketing as a tool for analysis.

**Term Offered:** Spring

**PHPR 4600 Seminar in Pharmacy Administration**

[1 credit hour]

This course provides a global perspective on pharmacy administration and healthcare related issues, including economic, humanistic, clinical, and other aspects of disease management. Prerequisite: Enrollment in the BSPS in Pharmacy Administration program or permission of instructor

**Term Offered:** Fall**PHPR 4730 Cosmetic Science I**

[3 credit hours]

A detailed discussion of cosmetics and personal care products. Main discussion points include product functions, ingredient selection, product design and formulation, product testing, and regulatory requirements.

Guest speakers from the cosmetic and personal care industry are regularly invited to the classes.

**Prerequisites:** PHPR 3040 with a minimum grade of D-**Term Offered:** Spring**PHPR 4740 Cosmetic Science Laboratory I**

[1 credit hour]

A laboratory course that focuses on cosmetic and personal care product formulation and testing basics. This laboratory supplements the Cosmetic Science 1 lecture course.

**Prerequisites:** PHPR 3240 (may be taken concurrently) with a minimum grade of D-**Term Offered:** Spring, Fall**PHPR 4750 Cosmetic Science II**

[3 credit hours]

A continuation of PHPR 4730 Cosmetic Science I. A detailed discussion of cosmetics and personal care products. Main discussion points include product functions, ingredient selection, product design and formulation, product testing, and regulatory requirements. Guest speakers from the cosmetic and personal care industry are regularly invited to the classes.

**Prerequisites:** PHPR 4730 with a minimum grade of D-**Term Offered:** Spring, Fall**PHPR 4760 Cosmetic Science Laboratory II**

[1 credit hour]

A laboratory course that focuses on cosmetic and personal care product formulation and testing basics. This laboratory supplements the Cosmetic Science 2 lecture course.

**Prerequisites:** PHPR 4730 with a minimum grade of D- and PHPR 4740 with a minimum grade of D-**Term Offered:** Fall**PHPR 4770 Advanced Drug Delivery Systems – I**

[3 credit hours]

The development of drug delivery systems relies on the broad understanding of many different physiological, chemical, and biological factors. This course is designed to introduce advanced drug delivery systems for oral, ocular, transdermal and buccal delivery. The course design is based on the premise that the student desires knowledge about the latest developments in formulation and drug delivery. Students may be required to design a project proposal for presentation.

**Term Offered:** Spring, Fall**PHPR 4780 Internship In Pharmacy Administration**

[3-6 credit hours]

An experiential course in which students acquire practical knowledge through hands-on experience in an area of pharmacy administration by working in an academic or non-academic (private business) environment.

**Term Offered:** Spring, Summer, Fall**PHPR 4820 Advanced Formulation Techniques**

[1 credit hour]

An advanced laboratory course in cosmetics and personal care products with an emphasis on specialty and active raw material formulation design techniques, new and emerging product development formulations, and quality control testing methods.

**Prerequisites:** PHPR 4760 with a minimum grade of D-**Term Offered:** Spring**PHPR 4880 Internship in Pharmaceutics**

[3-6 credit hours]

Students will acquire practical knowledge and hands-on experience in the areas of pharmacy administration or industrial pharmacy/pharmaceutics by working in the pharmaceutical industry or with health care systems.

**Term Offered:** Spring, Summer, Fall**PHPR 4890 Internship in Cosmetic Science and Formulation Design**

[3-6 credit hours]

An experiential course in which students acquire practical knowledge through hands-on experience in an area of cosmetic science by working in an academic, private or government laboratory or professional site.

**Term Offered:** Spring, Summer, Fall**PHPR 4900 Honors Seminar In Pharmacy Practice**

[1-3 credit hours]

An examination of a specific question in the context of the primary literature in pharmacy practice for advanced students.

**Term Offered:** Spring, Summer, Fall**PHPR 4910 Pharmacy Practice Problems**

[1-5 credit hours]

Selected undergraduate research projects in pharmacy practice.

**Term Offered:** Spring, Summer, Fall**PHPR 4920 Introductory Pharmacy Practice Experience 3**

[1 credit hour]

The purpose of this course is to increase students' awareness and involvement in areas related to the contemporary practice of pharmacy. Students will participate in projects that nurture their professional growth.

**Prerequisites:** PHPR 3930 with a minimum grade of C or PHPR 5930 with a minimum grade of C**Term Offered:** Spring, Summer, Fall**PHPR 4930 Introductory Pharmacy Practice Experience 4**

[1 credit hour]

The purpose of this course is to increase students' awareness and involvement in areas related to the contemporary practice of pharmacy. Students will participate in projects that nurture their professional growth.

**Prerequisites:** PHPR 4920 with a minimum grade of C or PHPR 6930 with a minimum grade of D-**Term Offered:** Spring, Summer

**PHPR 4940 Skin Care Science**

[1 credit hour]

Overview of the skin physiology, product development process, and products claims will be taught. Topics will include skin dryness, fine lines/wrinkles, and skin pigmentation concerns. Knowledge to develop skincare products from idea generation, ingredient selection to finished products will be provided.

**Prerequisites:** PHPR 3040 with a minimum grade of D-

**Term Offered:** Spring

**PHPR 4960 Honors Thesis In Pharmacy Practice**

[2-5 credit hours]

An examination of a specific research question in pharmacy practice which can be answered through application of experimental work.

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