

PHARMACY

Dean: Dr. Scott Stolte, Pharm.D

Assistant/Associate Deans: Dr. Jennifer Malinowski, Dr. Julie Olenak

Chairperson, Department of Pharmacy Practice: Dr. Judith Kristeller

Chairperson, Department of Pharmaceutical Sciences: Dr. Zbigniew Witczak

Faculty

Professors: Kristeller, Stolte, Witczak

Associate Professors: Bolesta., Bommareddy, J. Ference, K. Ference, Jacobs, Longyhore, Malinowski, Manning, McManus, Olenak, Roke-Thomas, Trombetta, VanWert

Assistant Professors: Franko, Hong, Kheloussi, Lewis, McCutcheon, Nguyen, Pezzino, Shah

Instructors: Holt-Macey, Powers

Professor Emeritus: Kibbe

Dean Emeritus: Graham

The School of Pharmacy offers a program of professional study leading to the Doctor of Pharmacy (Pharm.D.) degree. The purpose of the program is to prepare graduates for successful pharmacy practice in the health care environment of the twenty-first century. The U.S. health care system has been undergoing rapid, even dramatic, change. This transformation is expected by most observers to continue for some time. Those individuals and organizations responsible for the delivery of pharmaceutical care have not been and will not be sheltered from the forces of change. It becomes necessary, therefore, to provide new practitioners with the necessary knowledge base and skills required in a transformed health care system.

With the rapid transformation of health care delivery, a strong foundation in the basic sciences (e.g., pharmaceuticals, pharmacology, medicinal chemistry, anatomy and physiology) remains essential while clinical knowledge (e.g., therapeutics, pharmacokinetics, and pathophysiology) and skills (e.g. physical assessment, patient counseling, clinical decision-making) become even more important. Successful practice will demand an improved understanding of the social sciences (e.g., psychology, sociology, economics, health policy, management). Most importantly, the future pharmacy practitioner must have outstanding interpersonal skills. Among these are the abilities to communicate effectively and to function in a team environment.

Our Mission

Our mission is to develop pharmacists who will provide high quality health care and to make meaningful contributions to the science and practice of pharmacy.

Our Vision

We will be recognized as an exceptional pharmacy program through innovative education, contemporary practice, and valuable scientific contributions.

Our Values

Teamwork, Professionalism, Lifelong Learning, Cultural Competency, Personalized Attention, Community Engagement

Accreditation

Wilkes University's Doctor of Pharmacy program is accredited by the Accreditation Council for Pharmacy Education, 135 South LaSalle Street, Suite 4100, Chicago, IL 60503; 312-664-3575; FAX 312-664-4652; www.acpe-accredit.org.

Professional Program

The Professional Program is four years and leads to the Doctor of Pharmacy (Pharm.D.) degree after successful completion of a pre-professional program typically completed in two years. Graduates of the program are eligible for state examination to become licensed pharmacists after completing appropriate internship hours. The four years of education consist of three years of mostly in-class (i.e., lecture, laboratory, discussion group) and one full year of experiential education.

Admission into the Professional Program (Enrollment limit: 72)

To be admitted into the Professional Program of the School of Pharmacy, a student must have either enrolled in and successfully completed the Prepharmacy Program at Wilkes University or have submitted a successful application to the School of Pharmacy. Student are required to obtain a Pennsylvania Intern License once accepted to the program and in the summer prior to the start of the first professional year

Admission through the Application Process

Faculty reserve the right to select from among the applicants who will have the best opportunity to complete the curriculum within four years and have productive professional lives. Admission is based upon the student's academic ability as reflected in grades from pre-pharmacy courses, number of courses repeated, typical course loads, PCAT scores, total academic career, and references, as well as a successful interview. If applicable, the committee will also consider the most recent academic performance for those non-traditional students returning to college life after a hiatus. Each spring, a select group of applicants is invited for an interview, based upon a complete evaluation of all submitted application materials. Any missing documentation will compromise the application.

Pharmacy

The number of seats in the professional program available through the application process is dependent on the number of Pre-pharmacy Guaranteed Seat students able to claim a seat. A portion of remaining seats is available on an academically competitive basis to Wilkes students with overall and prerequisite GPAs above a 2.5, and a portion of seats is available to transfer students with overall and prerequisite GPAs above a 2.5 on a competitive basis. To be classified as a Wilkes student, the student 1) must complete and be enrolled at Wilkes University for two full-time consecutive semesters before enrollment in the Professional Program, AND 2) must complete 18 credits of prerequisite courses at Wilkes University by the end of the spring semester prior to enrollment in the Professional Program. Failure to meet both criteria will result in classification as a "transfer" student.

A maximum of 8 credits for prerequisite courses may be transferred to Wilkes University while enrolled in the Pre-Pharmacy Guaranteed Seat Program. The Registrar Office will determine course equivalency for transferred courses. The remaining prerequisite courses must be completed at Wilkes University. The Organic Chemistry prerequisite requirement may be met by taking 1) Organic I with lab and Organic II with lab or 2) Essentials of Organic Chemistry with lab at Wilkes University.

Applicants should review the technical standards set forth by the School of Pharmacy, which are available at:

<http://wilkes.edu/academics/colleges/nesbitt-college-of-pharmacy/program-information/pre-pharmacy-guaranteed-seat-program/technical-standards.aspx>

These technical standards describe non-academic abilities that are required for admission to, continuation in, and graduation from the School of Pharmacy to obtain a Pharm.D. degree.

How to Apply

To obtain a School of Pharmacy application, you may call or write:

School of Pharmacy

Wilkes University

Wilkes-Barre, PA 18766

(570) 408-4280

1-800-WILKESU ext. 4280

or download an application from <https://wilkes.edu/academics/colleges/nesbitt-college-of-pharmacy/program-information/pharmd-program/how-to-apply>.

Please note: The School of Pharmacy application is in addition to the Wilkes University application. All applicants must complete the application and return it before **January 15th** for the upcoming fall semester.

Pharmacy Minimum Admission Requirements

To be considered for admission to the Professional Program of the School of Pharmacy, the applicant:

- should complete the Wilkes University General Education Course Requirements or have completed a baccalaureate degree. A maximum of two deficient General Education courses will be considered for admission into the pharmacy program. Students with more than two deficient General Education courses may appeal to the Student Affairs Committee of the School of Pharmacy for consideration.
- must successfully (2.0 or higher) complete the Pharmacy Prerequisite Courses listed below by the end of the spring term prior to fall admission;
- must obtain a minimum overall GPA of 2.50 and a minimum GPA of 2.50 in the Pharmacy Prerequisite Courses listed below (Wilkes student) by the end of the spring semester prior to admission. Preferential consideration will be given to Wilkes students with GPAs of 3.0 or higher.

Prerequisite grades less than 2.0 may be repeated with the higher grade factoring into the GPA. However, applications will be placed at a lower priority for repeated courses of less than 2.0 in prerequisite courses are recorded. In addition, repeating courses in which a grade above a 2.0 was earned will not factor into the GPA. However, exceptions to the above rules will be considered on an individual basis and only if students can provide written explanation of extenuating circumstances.

(Note: admission into the Pharmacy Program is extremely competitive. Earning the minimum academic criteria necessary to submit an application does not in any way infer or promise an interview or admission into the program.)

- must provide three completed recommendation forms;
- must successfully complete the interview process;
- must demonstrate acceptable written communication skills; and
- must submit scores on the Pharmacy College Admission Test (PCAT). Please note only PCAT scores taken prior to January, in the year a student is applying, will be accepted.

Pharmacy Prerequisites

Two semesters (8 credits) of General Chemistry with labs of General Chemistry with labs Two semesters (8 credits) of Organic Chemistry with labs OR 4 credits of Essentials of Organic Chemistry with lab at Wilkes University

Two semesters (8 credits) of General Biology with labs

One semester (4 credits) of Calculus

One semester (3 credits) of Statistics

One semester (4 credits) of General Physics with lab

One semester (3 credits) of Microeconomics

One semester (3 credits) of Oral Communications

Professional Standards

Students enrolled in the program of the School of Pharmacy are expected to endorse professional standards by subscribing to the Oath of the Pharmacist. Students are also expected to abide by the American Pharmacists Association's Code of Ethics of the Profession.

Technical Standards

Students applying to and enrolling in the School of Pharmacy are expected to read, acknowledge, and understand the Technical Standards. These technical standards describe non-academic abilities that are required for admission to, continuation in, and graduation from the School of Pharmacy to obtain a Pharm.D. degree.

A candidate must have abilities and skills in the following five areas: 1) observational skills; 2) communication skills; 3) motor skills; 4) intellectual, conceptual, integrative, and quantitative skills; and 5) behavioral and social skills. Detailed descriptions of the Technical Standards are provided in the School of Pharmacy Application or by contacting the School of Pharmacy Dean's office.

Progression Requirements

All students in the Professional Program of the School of Pharmacy are required to meet minimum standards for progression. Academic progression requirements include a minimum semester and a cumulative pharmacy GPA of 2.0. In addition, no student shall be allowed more than 8.0 credits of less than 2.0 grades in required professional courses both inside and outside of the School. Any course with a grade of 0.0 must be repeated. At the end of each semester the progress of each student in the Professional Program will be reviewed. Students failing to meet minimal academic standards at the end of any semester must petition the Student Review Subcommittee through the Assistant Dean of Student Affairs to further progress in the School. More inclusive policies, including but not limited to acceptable classroom and experiential site behavior, alcohol and substance abuse, and other issues impacting the image of the professional program and the student, adopted within these guidelines are distributed to all students in the Nesbitt School of Pharmacy Student Handbook distributed annually. APPE progression is described in the APPE Course Manual.

Experiential Curriculum Component

Experiential learning is a critical component of the curriculum at Wilkes. Before being placed in an experiential setting, all students are required to:

- possess an active Pennsylvania Pharmacy Intern License;
- possess professional liability insurance,
- have documentation of immunizations,
- pass a physical examination,
- be certified in Basic Cardiac Life Support (healthcare provider) and Basic First Aid,
- have a criminal background check complete and clear, per site requirements, by an approved provider; and
- complete and clear other site-specific requirements, such as FBI fingerprint check, PA child abuse background check, etc.

These criteria are fully described throughout the curriculum, including deadlines and ramifications of non-compliance.

The Introductory Pharmacy Practice Experience (IPPE) consists of a number of different experiences. During the summer following successful completion of the P-1 year, students will complete a 2-week (80 hours) Introductory Pharmacy Practice Experience (IPPE I). The second professional year (the P-2 year) includes 40 hours of IPPE II during the fall and/or spring semester. In addition, students will complete a 2-week (80 hours) IPPE III during the summer after the P-2 year. In the third professional year (P-3) of the professional program, the curriculum includes a two-semester course in service learning (longitudinal care), and 40 hours of IPPE IV. IPPE V is a self-directed IPPE and consists of 20 hours of independent pharmacy-related, service-oriented learning earned during the P1 through P3 years. IPPE's occur at practice sites and in the community in locations not on campus.

The Advanced Pharmacy Practice Experience (APPE) occurs during the fourth professional year (the P-4 year) of the professional program. Each student will be assigned to 1 six-week rotation, plus 6 five-week rotations, some of which may be at some distance from the Wilkes-Barre area. As much as possible, The School of Pharmacy will assist in locating safe, affordable housing for APPEs. Since patient care is a continuous activity, some experiences may be conducted outside of regular school/business hours. Note also that APPE start and end dates do not adhere to the regular university calendar. The student is responsible for paying all transportation and housing costs for all experiential components of the curriculum, except where noted.

Graduation, Degree and Licensure Requirements

It is the student's responsibility to meet all graduation requirements, and it is expected that all students accepted into the Pharm.D. Program will meet regularly and frequently with their advisors to ensure timely progress toward their Doctor of Pharmacy degree. Graduation is dependent on successful completion of all required and elective course requirements in the School of Pharmacy (see Progression Requirements) AND completion of all General Education Requirements mandated by Wilkes University.

A student entering the Professional Program with a bachelor's degree from a four-year accredited college or university is exempted from the University's General Education Requirements, but is not exempted from the prerequisite entry requirements prescribed by the School of Pharmacy for entry into the Professional Program.

Students applying with degrees or courses from foreign colleges or universities will be evaluated to ensure significant portions of the General Education Requirements are satisfied.

All non-degreeed students entering the Professional Programs are encouraged to complete the General Education Requirements prior to beginning the Professional Curriculum. As mentioned, a student may be deficient in two General Education requirements and be granted admission into the program. Student

Pharmacy

will receive consultation and documentation from their advisor that these courses must be completed prior to graduation. Students with more than two deficient General Education courses may appeal to the Student Affairs Committee of the School of Pharmacy for consideration. This requirement is in place since there is no room within the professional curriculum, including summers, to complete the courses. As a matter of record, non-degreed students who have successfully completed the second professional year (P-2) in the School of Pharmacy AND completed all General Education Requirements will be awarded a Bachelor of Science in Science degree. The pass-through B.S. degree does not meet eligibility requirements for licensure as a pharmacist; it is only intended to acknowledge the academic achievement of students completing four years of university-level education.

Pharmacy licensure is governed by state law. All states require graduation from an accredited School or College of Pharmacy. Additional requirements for licensure should be requested from the state in which licensure is sought. It is the student's responsibility to fulfill all requirements for the state in which they seek licensure. Students must contact that State Board of Pharmacy for all appropriate paperwork. For further information, please contact the Dean's Office in the School of Pharmacy.

The School of Pharmacy reserves the right to revise the Pharmacy Curriculum at any time in order to prepare students for future practice roles, meet new accreditation requirements and to incorporate innovations in instruction

**ADVANCED PHARMACY
PRACTICE EXPERIENCE#**

PHARMACY.....11

**ADVANCED PHARMACY
PRACTICE EXPERIENCE#**

PHARMACY.....11

DOCTOR OF PHARMACY

Recommended Course Sequence

P-1 Fall Semester

PHA 301	Found. of Pharm. Practice I	2
PHA 308	Pharm. and Health Care Delivery	3
PHA 311	Pharmaceutics I	4
PHA 313	Pharm. Calculations	1
PHA 327	Medical Microbiology	3
PHA 331	Anatomy/Physiology I	4
Total Credits		17

P-1 Spring Semester

PHA 302	Pharmaceutical Care Lab I	1
PHA 304	Foundations of Pharm. Practice II	2
PHA 310	Clinical Research Design	3
PHA 312	Pharmaceutics II	4
PHA 332	Anatomy & Physiology II	4
PHA 365	Medical Biochemistry	4
Total Credits		18

P-1 Summer

PHA 335	Intro. Pharmacy Practice Experience I (IPPE I)	2
---------	--	---

P-2 Fall Semester

PHA 401	Pharmacy Care Lab II	1
PHA 405	Pharmaceutical Care Systems	2
PHA 411	Biopharm/Clinical Kinetics	3
PHA 421	Pharmacotherapeutics I	2
PHA 423	Pharmacotherapeutics II	2
PHA 425	Pharmacotherapeutics III	3
	Elective	2-3
Total Credits		16-17

P-2 Spring Semester

PHA 402	Pharmacy Care Lab III	1
PHA 410	Biotechnology/Immunology	3
PHA 412	Mgt. of Pharm. Operations	3
PHA 426	Pharmacotherapeutics IV	2
PHA 428	Pharmacotherapeutics V	4
PHA 430	Pharmacotherapeutics VI	2
PHA 440	IPPE II	1
	Elective	2-3
Total Credits		18-19

P-2 Summer

PHA445	Intro. Pharmacy Practice Experience III (IPPE III)	2
--------	--	---

P-3 Fall Semester

PHA 501	Pharmacy Care Lab IV	1
PHA 503	Longitudinal Care I	1
PHA 505	Pharmacy Law	2
PHA 509	Economic Evaluation of Pharm.	3
PHA 521	Pharmacotherapeutics VII	2
PHA 523	Pharmacotherapeutics VIII	4
PHA 525	Pharmacotherapeutics IX	2
	Elective	2-3
Total Credits		17-18

P-3 Spring Semester

PHA 502	Pharmacy Care Lab V	1
PHA 504	Longitudinal Care II	1
PHA 526	Pharmacotherapeutics X	3
PHA 528	Pharmacotherapeutics XI	2
PHA 530	Pharmacotherapeutics XII	4

Doctor of Pharmacy

PHA 532	Integrative Medicine/ Nutrition	3
PHA 555	IPPE IV	0.5
PHA 560	IPPE V	0.5
	Professional Elective	2-3
Total Credits		17-18

P-4 Advanced Pharmacy Practice Experiential Year

The APPE portion of the curriculum consists of 7 rotations for a total of 35 credit hours in various settings. Rotation #1 is 6 weeks in duration. Rotations #2-7 are 5 weeks in duration.

There are four required APPE rotations. In addition there are three elective APPE rotations. Information will be provided during the P-3 year.

PHA 510	General Medicine
PHA 511	Ambulatory Care
PHA 512	Community Practice
PHA 513	Health System

In addition, there are three elective APPE rotation. Information will be provided during the P-3 year.

PHARMACY.....11

**INTRODUCTORY PHARMACY
EXPERIENCE**

PHARMACY.....11

PHARMACOTHERAPEUTIC MODULES

(PHA 421, 423, 425, 426, 428 430, 521, 523, 525, 526, 528, and 530) -
A four-semester, twelve-module sequence (three modules per semester)
that integrates pharmacology, medicinal chemistry, pathophysiology, and
pharmacotherapy. This team-taught, interdisciplinary course provides
students with the opportunity to learn and apply concepts from these four
disciplines

PHA 421 Pharmacotherapeutics I: Principles of Pharmacology & Medicinal
Chemistry
Two credits

PHA 423 Pharmacotherapeutics II: Principles of Pharmacotherapeutics
Two credits

Prerequisite: PHA 421.

PHA 425 Pharmacotherapeutics III: Self-Care and Dermatology*
Three credits

PHA 426 Pharmacotherapeutics IV: Gastrointestinal Disorders*
Two credits

PHA 428 Pharmacotherapeutics V: Infectious Diseases*
Four credits

PHA 430 Pharmacotherapeutics VI: Hematology, Joint Disorders, Surgery*
Two credits

PHA 521 Pharmacotherapeutics VII: Pulmonary Disorders*
Two credits

PHA 523 Pharmacotherapeutics VIII: Cardiovascular Disorders*
Four credits

PHA 525 Pharmacotherapeutics IX: Renal Disorders*
Two credits

PHA 526 Pharmacotherapeutics X: Endocrine Disorders & Women's Health
Issues*
Three credits

PHA 528 Pharmacotherapeutics XI: Neoplastic Diseases*
Two credits

PHA 530 Pharmacotherapeutics XII: Central Nervous System Disorders*
Four credits

* PHA 423 is prerequisite to PHA 425-530.

PHARMACY.....11

PHA. PHARMACY

PHA-395-396, 495-496, 595-596. INDEPENDENT STUDY

Credits: 1-6

Independent study and research for advanced students in the field of the major under the direction of a faculty member.

Pre-Requisites

Approval of the department chairperson.

PHA-421, 423, 425, 426, 428, 430, 521, 523, 525, 526, 528 & 530 PHARMACOTHERAPEUTIC MODULES

Credits: 2 - 4

A four-semester, twelve-module sequence (three modules per semester) that integrates pharmacology, medicinal chemistry, pathophysiology, and pharmacotherapy. This team-taught, interdisciplinary course provides students with the opportunity to learn and apply concepts from these four disciplines.

Pre-Requisites

*PHA 423 is prerequisite to PHA 425-530.

PHA-301. & PHA 304 FOUNDATIONS OF PHARMACY PRACTICE

Credits: 2

The purpose of this two-semester course is to provide the student with the foundational knowledge, skills and attitudes needed to practice pharmacy in the 21ST century. In particular, this course will focus on skills (communication, teamwork), attitudes and other content relevant to the practice of pharmacy. The school's team-focused approach to learning is emphasized throughout. This course fulfills experiential requirements and so students will have the opportunity to interact with pharmacists and patients.

Pre-Requisites

P-I standing.

PHA-308. PHARMACEUTICAL AND HEALTH CARE DELIVERY

Credits: 3

Examination of health and pharmaceutical delivery in the U.S. conducted from a societal perspective. Emphasis is on public policy, economic behavior and outcomes. Application will be made to various pharmaceutical sectors (e.g., retail, health systems, manufacturing). Students should gain an understanding of the factors driving transformation of health care delivery and the implications for future pharmacy practice. Lecture: three hours per week.

Pre-Requisites

P-I standing or consent of the instructor.

PHA-310. CLINICAL RESEARCH AND DESIGN

Credits: 3

In order to apply current research to patient care activities, one must first develop the skills to interpret studies. The purpose of this course is to learn how research studies are designed to answer specific clinical questions, and how the study design is important in interpreting the results of the studies. Students will apply research design concepts and statistical techniques to design, critically analyze, and interpret preclinical, clinical, and economic studies of pharmaceuticals and treatment plans. Lecture: three hours per week.

Pre-Requisites

[[MTH-150]] or equivalent and P-1 standing or consent of the instructor.

PHA-311. & PHA 312 PHARMACEUTICS I & II

Credits: 4

The study and application of physical chemical principles that are necessary for the design, development and preparation of pharmaceutical dosage forms. The study of quantitative skills necessary for an understanding of the basic and clinical pharmaceutical sciences, including skills in pharmaceutical calculations and extemporaneous preparation of dosage forms. Lecture: three hours per week. Laboratory and Recitation: three hours per week.

Pre-Requisites

P-1 standing or consent of the instructor. [[PHA-311]] is a prerequisite for [[PHA-312]].

PHA-313. PHARMACY CALCULATIONS

Credits: 1

The common mathematical processes that a pharmacist may encounter in professional practice are covered. Interpretation of the prescription, including Latin abbreviations, will be discussed. Medical terminology and the generic name, trade name, manufacturer, and classification of the top 100 drugs will also be presented. Lecture one hour per week.

Pre-Requisites

P-1 standing or permission of the instructor.

PHA-327. MEDICAL MICROBIOLOGY

Credits: 3

An overview of microbiology with special emphasis on pathogenic microbiology. Lecture: three hours per week.

Pre-Requisites

P-1 standing or consent of the instructor.

PHA-331. & PHA 332 MEDICAL ANATOMY AND PHYSIOLOGY I & II

Credits: 4

Terms Offered: On Demand

In-depth principles of human anatomy and physiology as well as an introduction to pathophysiology will be presented. Lecture: Two hours per week. Recitation and Lab: two hours per week.

Pre-Requisites

P-1 standing or consent of the instructor.

This course is restricted to enrolled Pharmacy students. Consideration may be given to non-pharmacy students with overall GPAs of 3.0 or greater, if there is room in the lecture and lab sessions, and with instructor approval. NOTE: [[PHA-331]] is a prerequisite for [[PHA-332]].

Course Descriptions

PHA-335. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE I

Credits: 2

This course will provide introductory practice experience to students in the community setting. The course fosters the development of professionalism in an environment of practical application of knowledge, skills, and attitudes. Students will be faced with a variety of issues practical to community pharmacy. The student will take an independent learning approach under the supervision of a practicing community pharmacist. The course is two full-time weeks (80 hours) of experience.

Pre-Requisites

Successful completion of all required courses in the P-1 year, or permission of instructor.

PHA-365. MEDICAL BIOCHEMISTRY

Credits: 4

Introduction to basic biochemistry concepts, focusing on the structure and function of vitamins, proteins, and lipids as well as bioenergetics and major catabolic pathways. The catabolism of carbohydrates, fats and amino acids will be discussed including reactions and regulation. Common metabolic pathways of drugs, enzyme induction and metabolism down regulation will also be presented. Lecture: Four hours per week. Cross-listed with [[CHM-365]], [[BEGR-465]].

Pre-Requisites

P-1 standing or consent of instructor.

PHA-405. PHARMACEUTICAL CARE SYSTEMS: DESIGN AND CONTROL

Credits: 2

Examines delivery of pharmaceutical products and services from a systems perspective in a variety of patient care settings. Focus is upon effectiveness, efficiency, and quality. Covers design of systems, establishment and monitoring of key indicators, total quality management and quality assurance agencies (e.g., JCAHO, NCQA). Lecture: two hours per week.

PHA-410. IMMUNOLOGY AND BIOTECHNOLOGY

Credits: 3

A discussion of nonspecific host defense mechanisms and a detailed description of specific immunity. Products that impart artificial active and passive immunity are presented. The concept of biotechnology is discussed together with the currently available products of genetic engineering that relate to immunology. The various immunological disorders and the immunology of cancer and HIV are discussed. Lecture: three hours per week.

Pre-Requisites

[[PHA-331]], [[PHA-332]], [[PHA-365]] or consent of the instructor.

PHA-411. BIOPHARMACEUTICS AND CLINICAL PHARMACOKINETICS

Credits: 3

The fundamentals of biopharmaceutics and pharmacokinetics are presented. The physical and chemical properties of the drug, dosage form, route of administration, patient characteristics, and disease state will be related to the absorption, distribution, metabolism, and elimination in the body. Students will become familiar with calculations for individual drugs to determine regimens that optimize the safety and effectiveness of medications for individual patients. Lecture: three hours per week.

Pre-Requisites

[[PHA-311]], [[PHA-312]], or consent of the instructor.

PHA-412. MANAGEMENT OF PHARMACY OPERATIONS

Credits: 3

The principles of management, including personnel and financial management, will be covered as they apply to management of pharmacy operations in a variety of settings (e.g., community, health system, managed care). Lecture: three hours per week.

Pre-Requisites

[[PHA-308]] or consent of the instructor.

PHA-421. PHARMACOTHERAPEUTICS I: PRINCIPLES OF PHARMACOLOGY & MEDICINAL CHEMISTRY

Credits: 2

This course is the 1st of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This particular course will emphasize the most fundamental concepts central to drug therapy. A major emphasis will be placed on the interactions of drugs with their cellular targets in the human body, and the chemical properties of drugs that dictate their biological activity.

Pre-Requisites

[[PHA-310]], [[PHA-327]], [[PHA-331]], [[PHA-332]] and [[PHA-365]].

PHA-423. PHARMACOTHERAPEUTICS II: PRINCIPLES OF PHARMACOTHERAPEUTICS

Credits: 2

This course is the 2nd of a twelve module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for understanding Pharmacotherapeutics principles.

Pre-Requisites

[[PHA-421]].

PHA-425. PHARMACOTHERAPEUTICS III: SELF-CARE AND DERMATOLOGY*

Credits: 3

Terms Offered: Winter

This course is the 3rd of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of dermatological disorders and self-care issues.

Co-Requisites

*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]].

PHA-426. PHARMACOTHERAPEUTICS IV: GASTROINTESTINAL DISORDERS*

Credits: 2

This course is the 6th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of gastrointestinal diseases.

Pre-Requisites

*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]].

PHA-428. PHARMACOTHERAPEUTICS V: INFECTIOUS DISEASES*

Credits: 4

This course is the 4th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of infectious diseases.

Pre-Requisites

*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]].

PHA-430. JOINT, AUTOIMMUNE AND MUSCULOSKELETAL DISORDERS

Credits: 2

This course is the 5th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of joint autoimmune and musculoskeletal diseases.

Pre-Requisites

*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]].

PHA-435. PHARMACOGENOMICS

Credits: 2

Students will learn to understand how human genetics and genomics can be used to provide optimized drug therapy and patient care. Learning about this emerging field will enable students to better understand and manage new genomics-based diagnostic tools and make personalized treatment choices. Students will also spend time discussing societal and ethical implications of genetic testing and the resultant individualization of drug therapy, explain basic principles of human genetics and heredity, and more. Requirement: P-3 standing.

Pre-Requisites

*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]].

PHA-440. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE II

Credits: 1

This course will provide introductory practice experience to students in two health care settings: prescriber's clinics and a clinical pharmacy site. Students will have an independent approach to learning and gain a broader understanding of these settings and the role that pharmacists may play.

Pre-Requisites

Requirement: successful completion of all required courses in the P1 year, or permission of instructor.

PHA-445. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE III

Credits: 2

This course will provide introductory practice experience to students in the health-system setting. The course fosters the development of professionalism in an environment of practical application of knowledge, skills, and attitudes. Students will be faced with a variety of issues practical to this area of practice. The student will take an independent learning approach under the supervision of a practicing community pharmacist.

The course is two full-time weeks (80 hours) of experience.

Pre-Requisites

Requirement: Successful completion of all required courses in P-2 year, or permission of instructor.

PHA-450. NEUROPHARMACOLOGY OF DRUGS OF ABUSE

Credits: 3

In-depth analysis of drugs of abuse, including pharmacokinetics, pharmacodynamics, tolerance, sensitization, physical dependence, and effects of drug use during pregnancy. Drug testing and substance abuse treatment strategies will also be discussed. Lecture: three hours.

Pre-Requisites

[[PHA-421]] or consent of the instructor.

PHA-452. EXTEMPORANEOUS COMPOUNDING

Credits: 3

Students will achieve basic and advanced skills in compounding pharmaceutical dosage forms for individualized patient therapy to replace a lack of commercially available products, and enhance therapeutic problem-solving between the pharmacist and physician to enhance patient compliance. Students will work independently on research assignments and compounding preparations. Lecture: one hour per week. Lab six hours per week.

Pre-Requisites

[[PHA-311]] and [[PHA-312]] and consent of the instructor.

Course Descriptions

PHA-456. CONCEPTS IN PRIMARY CARE

Credits: 2

The course is designed to allow students to explore and develop advanced knowledge and skills related to diseases and medications commonly encountered in a primary care environment. This course will be of value to pharmacy students seeking careers in ambulatory care pharmacy practice, community pharmacy, long-term care and population health management. Topics are presented in a case-based discussion format that includes multiple diseases and medications and through student-led mini topic discussions.

Pre-Requisites

[[PHA-311]] and [[PHA-312]]

PHA-488. ASPECTS OF CARING FOR THE PAIN PATIENT

Credits: 2

This course is an interactive and interprofessional approach to the assessment and management of pain. Various teaching and learning strategies will allow students to develop and appreciate the understanding of the social, psychological, physical, spiritual and ethical implications of pain.

Pre-Requisites

[[PHA-331]], [[PHA-332]] and [[PHA-421]], P3 standing or consent of instructor.

PHA-503. AND PHA 504 LONGITUDINAL CARE LAB I & II

Credits: 1

Students will follow a patient or patients over an extended period of time in a medical or home setting. Pharmaceutical knowledge and skills will be applied in communications, health assessment, monitoring or pharmacotherapy, evaluation of both humanistic and clinical outcomes. Issues of health care, cost access, and quality as revealed through each patient's interaction with health and pharmaceutical care systems will be addressed. Three hours per week. Students are responsible for transportation to and from all off-campus experiential sites.

Pre-Requisites

[[PHA-503]] is the prerequisite for [[PHA-504]].

PHA-505. PHARMACY LAW

Credits: 2

Terms Offered: Fall

The study of federal and state statutes, regulations and court decisions which control the practice of pharmacy and drug distribution. Civil liability in pharmacy practice and elements of business and contract law will be covered. Lecture: two hours per week.

PHA-509. ECONOMIC EVALUATION OF PHARMACEUTICAL PRODUCTS AND SERVICES

Credits: 3

Introduction to commonly used economic evaluation methods (e.g., cost-minimization, cost-utility, cost-benefit, cost-effectiveness) as applied to pharmaceutical products and services. Quality of life and outcomes research will also be explored. Emphasis is on understanding evaluation methods and research design and interpreting the relevant literature for practice applications. Lecture: three hours per week.

Pre-Requisites

[[PHA-308]] and [[PHA-310]] or consent of the instructor.

PHA-510. GENERAL MEDICINE ADVANCED PHARMACY PRACTICE EXPERIENCE

Credits: 5-6

Integration of the basic pharmacy related concepts to the delivery of pharmaceutical care in general medicine practice. Clinical practice: 40 hours per week for a total of five to six weeks.

Pre-Requisites

Successful completion of P1-P3 curriculum in full.

PHA-511. AMBULATORY CARE ADVANCED PHARMACY PRACTICE EXPERIENCE

Credits: 5-6

Integration of the basic pharmacy related concepts to the delivery of pharmaceutical care in ambulatory care settings. Clinical practice: 40 hours per week for a total of five to six weeks.

Pre-Requisites

Successful completion of P1-P3 curriculum in full.

PHA-512. COMMUNITY ADVANCED PHARMACY PRACTICE EXPERIENCE

Credits: 5-6

Integration of the basic pharmacy related concepts to the delivery of pharmaceutical care in community practice settings. Clinical practice: 40 hours per week for a total of five to six weeks.

Pre-Requisites

Successful completion of P1-P3 curriculum in full.

PHA-513. HEALTH SYSTEM ADVANCED PHARMACY PRACTICE EXPERIENCE

Credits: 5-6

Integration of the advanced pharmacy related concepts to the delivery of pharmaceutical care in the health system setting. Clinical practice: 40 hours per week for five to six weeks.

Pre-Requisites

Successful completion of P1-P3 curriculum in full.

PHA-521. PHARMACOTHERAPEUTICS VII: PULMONARY DISORDERS*

Credits: 2

This course is the 7th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of pulmonary diseases.

Pre-Requisites

*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]].

PHA-523. PHARMACOTHERAPEUTICS VIII: CARDIOVASCULAR DISORDERS***Credits:** 4

This course is the 8th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of cardiovascular diseases.

Pre-Requisites

*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]].

PHA-525. PHARMACOTHERAPEUTICS IX: RENAL DISORDERS***Credits:** 2

This course is the 9th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of renal diseases.

Pre-Requisites

*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]].

PHA-526. PHARMACOTHERAPEUTICS X: ENDOCRINE DISORDERS & WOMEN'S/MEN'S HEALTH ISSUES***Credits:** 3

This course is the 10th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of endocrine diseases.

Pre-Requisites

*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]].

PHA-528. PHARMACOTHERAPEUTICS XI: NEOPLASTIC DISEASES***Credits:** 2

This course is the 11th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of neoplastic diseases.

Pre-Requisites

*[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]]

PHA-530. PHARMACOTHERAPEUTICS XII: CENTRAL NERVOUS SYSTEM DISORDERS***Credits:** 4

This course is the 12th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of CNS and mental health disorders.

Pre-Requisites

[[PHA-423]] is prerequisite to [[PHA-425]] - [[PHA-530]]

PHA-532. INTEGRATIVE MEDICINE AND NUTRITION**Credits:** 3

The purpose of the Alternative Medicine and Nutrition course is to help students learn to integrate nonconventional treatments (natural medicines, manipulation therapy, acupuncture, etc.) into traditional treatment strategies. Additionally, students will learn about nutrition support practices, including enteral and parenteral care.

Pre-Requisites

[[PHA-331]], [[PHA-332]], [[PHA-365]] or consent of the instructor.

PHA-534. INTRODUCTION TO HOSPITAL PHARMACY PRACTICE**Credits:** 2

This course introduces students to the practice of pharmacy within a hospital setting. Topics discussed include the accreditation process for hospitals, career options and residency or fellowship training, medication formulary management, automation and technology in hospital pharmacies, medication calculations, medication safety, clinical pharmacy practice, and sterile product preparation.

PHA-536. PRINCIPLES OF ADVANCED COMMUNITY PHARMACY MANAGEMENT**Credits:** 2

This course is designed to provide a foundation for students interested in pursuing the development and implementation of advanced clinical programs in a community pharmacy. The student will be introduced to principles in pharmacy and fiscal management, professional development, and the management and legal issues relating to clinical pharmacy services. Didactic and active learning techniques will be employed throughout the course and the student will be required to develop a business plan. Lecture two hours per week.

Pre-Requisites

P-2 or P-3 standing or consent of the instructor.

PHA-538. PEDIATRIC PHARMACOTHERAPY**Credits:** 2

This course is designed to expand the students current knowledge base regarding the pediatric population and to introduce the core concepts involved in the care of this special population. The course prepares students to identify and address drug-related problems in pediatric patients and to demonstrate competency within those areas. This will be accomplished by completion of case scenarios, actual patient presentations, and a take-home examination. An on-site visit to the Children's Hospital of Philadelphia (CHOP) is required. Lecture two hours per week.

Pre-Requisites

P-2 or P-3 standing

Course Descriptions

PHA-540. COMPREHENSIVE DIABETES MANAGEMENT

Credits: 3

Terms Offered: Spring

This course provides a multidisciplinary foundation for health professionals in the principles of diabetes management. Students who successfully complete the course will have knowledge and the basic skill set that is needed to begin practicing diabetes management. The majority of this course is independent self-study of online lectures, but there are mandatory on-campus discussions and exams.

Pre-Requisites

Requirement: P-2 or P-3 standing.

PHA-544. MANAGED CARE PHARMACY

Credits: 2

Terms Offered: Spring

This elective is intended to help future pharmacists interested in any area of practice better understand the clinical and business decision-making processes of the health care system. The elective will introduce and reinforce the concepts of population health and value, explore tools available to limit healthcare spending, and discuss unique ways pharmacists can be involved in improving patient care. This course will be offered during the spring semester each year.

Pre-Requisites

P2 or P3 standing.

PHA-552. PRINCIPLES OF BIOORGANIC AND MEDICINAL CHEMISTRY

Credits: 3

This will be an introductory course, the aims of which are to provide the principles of bioorganic and medical chemistry, including an understanding of drug structure-activity relationships, prediction of the physicochemical properties of a drug, basic knowledge of the major pathways of drug metabolism, and factors that can contribute to drug-drug interactions.

Pre-Requisites

[[CHM-231]], [[CHM-232]], [[PHA-327]], [[PHA-365]].

PHA-555. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE IV

Credits: 1-half

This course will provide introductory practice experience to students in the clinical telepharmacy setting. Students will gain a broader understanding of this setting and the role that pharmacists may play. Requirement: successful completion of all required courses in the P3 year, or permission of instructor.

Pre-Requisites

P-3 standing.

PHA-556. ROLE OF PHYTOCHEMICALS ON HEALTH AND DISEASE

Credits: 2

Students will learn the basic concepts and classification of phytochemicals present in our daily diet, followed by the study of specific phytochemicals and their relation to human health and disease. Basic mechanisms and pathways through which phytochemicals act and alter will be discussed.

Students will have an opportunity to gain an in-depth understanding of a specific phytochemical of their choice or any other phytochemical designated by the instructor through a research review paper and an in-class presentation.

Pre-Requisites

P-3 standing.

PHA-558. PRINCIPLES OF TOXICOLOGY: FROM BEAKER TO BEDSIDE

Credits: 2

This toxicology elective is designed to provide the student with introductory knowledge of the molecular mechanisms of action and clinical management of poisons. The course will begin with introductory concepts such as history, mechanisms of cell injury and toxicant disposition. The student will then be exposed to the fundamental principles of managing an acutely poisoned patient. Toxicology lectures on each major organ system will prepare students for group presentations. The aims of student presentations will be to achieve a greater understanding of the clinical management of the poisoned patient, and to hone presentation skills. To the extent that is feasible, the course will involve lectures, or other learning experiences, led by external specialists.

The scope of poisons that will be discussed is broad, and includes environmental toxins, industrial toxicants, and drugs. Specific agents will include heavy metals, volatile solvents, common plant toxins, rodenticides, and several drugs. Students may be expected to participate in one laboratory exercise, wherein they will learn a fundamental method to characterize the mechanism and/or extent of cell death induced by a toxicant.

Pre-Requisites

P-2 or P-3 standing or permission of the instructor.

PHA-560. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE V

Credits: 1-half

The Self-Directed Introductory Pharmacy Practice Experience (SD-IPPE) course is designed to expose students to various service-learning opportunities throughout their P1 through P3 years. This experience consists of 3 components: participation in and development of service-learning projects, reflection, and self-directed learning. Students may develop their own experiences or participate in opportunities offered by the School or professional organizations.

Requirements for service-learning hours will increase as the student progresses through the curriculum. Each student must complete a minimum of 2, 8, and 10 hours during the P1, P2, and P3 years, respectively (total 20 hours). Additional details are provided in the SDIPPE syllabus conveniently posted in E*Value.

**PHA-599. A, B, AND C ELECTIVE ADVANCED PHARMACY
PRACTICE EXPERIENCE ROTATIONS**

Credits: 5-6

Terms Offered: Fall

Advanced pharmacy practice experience involved in different aspects of pharmaceutical care. (Courses to be determined.) Clinical practice 40 hours per week for a total of five weeks.

Pre-Requisites

Successful completion P-1 - P-3 curriculum in full.