Jefferson College of Pharmacy 2017-2018
Course Catalog

Phone: (215) 503-9000
Web Site: http://www.jefferson.edu/pharmacy/
Jefferson College of Pharmacy
JEFFERSON COLLEGE OF PHARMACY

DOCTOR OF PHARMACY PROGRAM

In March 2006 the Board of Trustees of the Thomas Jefferson University (TJU) approved a plan committing the resources for the establishment of the Jefferson School of Pharmacy (JSP). The 4-year Doctor of Pharmacy Program commenced with its inaugural class in the Fall 2008 semester. On July 1, 2015, the name of the School was changed to the Jefferson College of Pharmacy.

MISSION

The JCP mission is to prepare our students for careers in the profession of pharmacy. Through the provision of a learner-centered, interdisciplinary curriculum, our students will develop the requisite knowledge, skills and attitudes to provide excellent patient-centered and population-based care. Consistent with the mission of TJU, we strive to develop in our students a sense of social, personal and professional responsibility.

VISION STATEMENT

The JCP will consistently demonstrate its ability to provide a superb environment that fosters collaborative relationships with healthcare practitioners and scientists that result in the advancement of patient care and safety, educational methodologies and research. It will be recognized as a premier organization that advances the profession of pharmacy through our graduates and our faculty.

- Our graduates will be recognized for their: ability to provide outstanding patient-centered and population-based care; leadership skills; cultural competency; social responsibility; and commitment to maintaining professional competence throughout their careers.

- Our faculty will be recognized for their: strong commitment to the advancement of pharmacy and graduate education, patient care and research; leadership in the professional societies and educational organizations; and strong commitment to the improvement of our community through service initiatives.
JCP CORE VALUES

We are committed to:

- maintaining a culture that fosters integrity, respect, social responsibility, diversity and compassion;
- a learner-centered educational environment that recognizes the importance of lifelong learning;
- meeting the diverse needs of and fostering positive morale among our students, faculty and staff;
- preparing and encouraging our students to pursue postgraduate education and training programs;
- the continued professional development and mentoring of our students, faculty and staff;
- the development of leadership skills among students, faculty and staff;
- a research-rich environment that stimulates the advancement of science, patient care and safety, and educational effectiveness; and,
- maintaining an ongoing assessment program that results in the continuous improvement of our educational program, research endeavors and infrastructure in an effort to support our mission and vision.

ACCREDITATION DISCLOSURE STATEMENT

The Accreditation Council for Pharmacy Education (ACPE) accredits Doctor of Pharmacy programs offered by Colleges and Schools of Pharmacy in the United States and selected non-US sites. For a Doctor of Pharmacy program offered by a new College or School of Pharmacy, ACPE accreditation involves three steps: Precandidate status, Candidate status, and Full accreditation. Precandidate accreditation status denotes a developmental program, which is expected to mature in accord with stated plans and within a defined time period. Precandidate status is awarded to a new program of a College or School of Pharmacy that has not yet enrolled students in the professional program, and authorizes the college or school to admit its first class. Candidate accreditation status is awarded to a Doctor of Pharmacy program that has students enrolled, but has not yet had a graduating class. Full accreditation is awarded to a program that has met all ACPE standards for accreditation and has graduated its first class. Graduates of a class designated as having Candidate status have the same rights and privileges of those graduates from a fully accredited program, generally including eligibility for licensure. ACPE conveys its decision to the various boards of pharmacy and makes recommendations in accord with its decisions. It should be noted, however, that decisions concerning eligibility for licensure, by examination or reciprocity, reside with the respective boards of pharmacy in accordance with their statues and administrative rules.
The Doctor of Pharmacy program of the Thomas Jefferson University, Jefferson College of Pharmacy was awarded Candidate accreditation status during the June 24 - 28, 2009 meeting of the ACPE Board of Directors, based upon an on-site evaluation conducted March 24 - 26, 2009, and discussion with University, College, and School officials. Full accreditation of the Doctor of Pharmacy program was awarded by the Board during its meeting in June 2012, following the graduation of students in May 2012 from the program.

Updated information regarding the Jefferson College of Pharmacy accreditation status can be found at [http://www.jefferson.edu/pharmacy](http://www.jefferson.edu/pharmacy).

**Program Objectives**

Upon completion of the Doctor of Pharmacy Program, our graduates will demonstrate the following in functioning as effective members of the health care team in the provision of patient-centered and population-based care.

- The knowledge, understanding and application of the biomedical, pharmaceutical, social, behavioral, administrative and clinical sciences.
- The ability to think critically and problem solve.
- Effective communication through both written and verbal means.
- The highest level of professional, legal and ethical behavior.
- The professional acumen to identify and analyze emerging healthcare issues.
- A working knowledge of how legislation, regulations and related programs affect the practice of pharmacy.
THE CURRICULUM

The following curriculum is subject to change by the faculty through the approval of the JCP Educational Policy and Philosophy committee. The delivery of the Doctor of Pharmacy curriculum will include a variety of educational methods including didactic lectures, small group discussions, technology applications both within and outside the classroom, application of new skills, and experiential education in various pharmacy practice sites. Please note that IPPE, below, refers to Introductory Pharmacy Practice Experience and APPE refers to Advanced Pharmacy Practice Experience.

First Year

FALL SEMESTER

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Credits</th>
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<tbody>
<tr>
<td>Biochemistry</td>
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<td>Immunology</td>
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<td>IPPE: Healthcare Service Learning or Community Pharmacy</td>
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<tr>
<td>Health Care Communications and Patient Counseling</td>
<td>2</td>
</tr>
<tr>
<td>Health Care Delivery Systems</td>
<td>2</td>
</tr>
<tr>
<td>Pathophysiology I</td>
<td>3</td>
</tr>
<tr>
<td>Pharmacy Practice I</td>
<td>1</td>
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<tr>
<td>Preventive Healthcare and Self Care Issues</td>
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<td><strong>Total credits</strong></td>
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SPRING SEMESTER

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<th>Course</th>
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<tr>
<td>Biostatistics</td>
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<tr>
<td>IPPE: Healthcare Service Learning or Community Pharmacy</td>
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<tr>
<td>Medicinal Chemistry</td>
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</tr>
<tr>
<td>Molecular and Cell Biology</td>
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<tr>
<td>Pathophysiology II</td>
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<tr>
<td>Pharmacy Practice II</td>
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<td>Physical Assessment and Clinical Skills</td>
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<td><strong>Total credits</strong></td>
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**Second Year**

**FALL SEMESTER**

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<th>Course</th>
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<tr>
<td>Drug Information and Literature Evaluation</td>
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<tr>
<td>Medication Safety</td>
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</tr>
<tr>
<td>Pharmaceutical Calculations</td>
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</tr>
<tr>
<td>Pharmaceutics and Drug Delivery Systems</td>
<td>3</td>
</tr>
<tr>
<td>Pharmaceutics Laboratory</td>
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<tr>
<td>Pharmacology I</td>
<td>3</td>
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<tr>
<td>Pharmacy Management: Theory and Applications</td>
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<td>Pharmacy Practice III</td>
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**SPRING SEMESTER**

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<tr>
<td>Biopharmaceutics and Principles of Clinical Pharmacokinetics</td>
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<tr>
<td>Clinical Diagnosis/Pharmacotherapy I and II</td>
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<td>IPPE: Hospital Pharmacy or Ambulatory Care</td>
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<tr>
<td>Pharmacology II</td>
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<tr>
<td>Pharmacy Practice IV</td>
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<td>Pharmacy Practice Laboratory I</td>
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**Third Year**

**FALL SEMESTER**

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<tr>
<td>Pharmacology III</td>
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<td>Interprofessional Grand Rounds</td>
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<td>Pharmacy Practice Laboratory II</td>
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<td>-----------------------------------------------------------------</td>
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</tr>
<tr>
<td>Clinical Diagnosis /Pharmacotherapy V and VI</td>
<td>6</td>
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<tr>
<td>Integrated Practice Applications</td>
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<tr>
<td>IPPE: Direct Inpatient Care or Elective Site</td>
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</tr>
<tr>
<td>Pharmacoconomics and Health Outcomes</td>
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<tr>
<td>Pharmacy Law</td>
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<td>Pharmacy Practice Laboratory III</td>
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<td>Professional Seminar I</td>
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<td>Total credits</td>
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**Fourth Year**

APPEs (6 weeks each, 40 hours per week)

- Community Pharmacy                                           | 6                |
- Hospital Pharmacy                                             | 6                |
- Ambulatory Care                                                | 6                |
- Direct Inpatient Care                                         | 6                |
- Direct Patient Care Elective                                  | 6                |
- Direct or Indirect Patient Care Elective                      | 6                |
- Professional Seminar II                                       | 2                |

Total Credits for the Doctor of Pharmacy Degree                | 141              |

* Students must complete a minimum of 8 elective credits prior to the conclusion of the spring of their P3 year.
Important Notice
Individuals who have been convicted of a felony or misdemeanor may be denied certification or licensure as a health professional. Information regarding individual eligibility may be obtained from the appropriate credentialing bodies. Clinical rotation or experiential education sites may require a criminal background check and/or child abuse check in order to permit participation in the clinical experience or rotation. Participation in clinical experiences or rotations is a required part of the curriculum and a requirement for graduation. Clinical rotation and rotation sites may deny a student’s participation in the clinical experience or rotation because of a felony or misdemeanor conviction, failure of a required drug test, or inability to produce an appropriate health clearance, which would result in delayed graduation or in the inability to graduate from the program.

Student Academic and Clinical Performance
Specific policies on academic and clinical regulations such as passing grades, acceptable performance, academic probation and dismissal, failure in clinical performance, grade appeal protocol, incomplete grades, criteria for graduation, ethical behavior, attendance, withdrawal from courses, withdrawal from the program, refund of tuition and code of conduct are described in detail in the Jefferson School of Pharmacy Student Handbook. Questions about policies can be discussed with the student’s faculty advisor. Please note that the minimum passing grade is a C in required, letter-graded courses and a pass in all pass/fail courses and that students must have a minimum cumulative grade point average of 3.0 for graduation. If the student’s cumulative GPA falls below 3.0 for more than two semesters (consecutive OR nonconsecutive) during their tenure in the Doctor of Pharmacy program, he/she will be dismissed from the program.
COLLEGE OF PHARMACY COURSE DESCRIPTIONS

REQUIRED COURSES

First Year

Biochemistry (3) PHRM 510
The biochemistry course describes the chemistry and metabolism of carbohydrates, lipids, and proteins. It also addresses blood clotting and selected topics of the production and degradation of blood cells.

Biostatistics (3) PHRM 511
This course will provide an understanding of commonly used research methods and statistical tests, including the skills needed to evaluate statistical results, and the knowledge necessary to apply the concepts of statistical versus clinical significance to practice. The course is a practical approach to using statistical tests in a research framework. The focus of the course is on enabling students to become consumers of the research literature rather than biostatisticians.

Healthcare Communications and Patient Counseling (2) PHRM 524
Healthcare communications and patient counseling provides the foundation to effectively communicate both verbally and in writing with other healthcare professionals and patients. The course addresses such topics as health literacy, influence of culture on communicating healthcare information, principles of behavior modification, active learning, empathy, and interviewing techniques. Using knowledge gained from PHRM 512 Preventive Healthcare and Self-care Issues, emphasis will also be placed on learning and practicing the art of patient interviewing, assessment, over-the-counter (OTC) drug therapy selection, and OTC drug therapy counseling.

Healthcare Delivery Systems (2) PHRM 519
Provides an introduction to the US health care delivery system; addresses the social, political, and economic context of US health care, the distribution of medical care and pharmaceutical products and services, as well as the role of public and private insurers, pharmaceutical industry, and managed care organizations on health care delivery in the US.

Immunology (3) PHRM 525
Introduces students to the immune system as an adaptive defense system that recognizes invading pathogenic organisms and mounts a response to eliminate or neutralize foreign infectious agents. Students will be introduced to the molecules, the cells and organs, and the processes involved in host defense against infection. An
overview of basic principles, concepts, and techniques used to assess immune status will be presented that will be necessary for further exploration into related topics in immunology–based pharmacology and therapeutics. Students will also be introduced to the ways in which the adaptive immune system interacts with and depends upon innate defense systems. Further, the ways in which these defense mechanisms can fail will be presented, including failures to combat infection or tumor growth and development of over-reactions to infections, to environmental agents, or to self.

**IPPE: Healthcare Service Learning (1) PHRM 522**
The purpose of this course is to foster a sense of community involvement and instill a basic understanding of pharmaceutical care in P1 students through healthcare related service. The course focuses on identifying and addressing human and community needs and will provide students the opportunity to practice basic skills required to provide pharmaceutical care.

The course is conducted at service sites in Philadelphia. Healthcare related community service sites include, but are not limited to: wellness centers, homeless shelters, senior centers and clinics for the underserved. Experiences at the site may incorporate knowledge gained and skills and attitudes developed in the P1 didactic coursework, as well as the IPPE II course, depending upon which semester IPPE I is taken.

**IPPE: Community Pharmacy (1) PHRM 523**
The purpose of the course is to instill a basic understanding of community pharmacy practice through site-based experiences.

The course is conducted in outpatient, community pharmacies located in Philadelphia and its surrounding counties. Experience at the site may incorporate knowledge gained and skills and attitudes developed in the P1 didactic coursework, as well as the IPPE I course, depending upon which semester IPPE II is taken.

**Medicinal Chemistry (2) PHRM 513**
Medicinal chemistry addresses the physicochemical properties of drug molecules, the chemical basis of pharmacology and therapeutics, fundamental pharmacophores for drugs used to treat disease, structure-activity-relationships (SAR) pertaining to drug-target interactions and chemical pathways of drug metabolism. The main objective of the course is to understand how the chemical structures of drugs determine their biological properties, including absorption, distribution to sites of action, interactions with pharmacological targets, metabolic inactivation, forms and routes of elimination, and therapeutic potential. The course is designed to include basic chemical concepts that govern drug action, general principles of medicinal
chemistry, and chemical characteristics of selected drug classes. Students will also gain an understanding of how these principles can be generally applied to making drug therapy decisions. Learning activities in the course consist primarily of lectures, recitations, and problem-solving exercises.

**Molecular and Cell Biology (3) PHRM 520**
This molecular and cellular biology course contains instruction on nucleotide metabolism, the central dogma (DNA to RNA to protein), the structure and behavior of cells, and the major modes of inheritance. This course will prepare students for topics that are covered in the Pathophysiology, Clinical Diagnosis/Pharmacotherapy and Pharmacology courses.

**Pathophysiology I (3) PHRM 514**
Provides an understanding of the basic principles and mechanisms of disease, including: inflammation and repair; degeneration; hemodynamic disturbances; and developmental defects. This level of understanding will be applied in addressing disease states amenable to pharmacist intervention. In addition, medical terminology will be learned and applied to the course content.

**Pathophysiology II (3) PHRM 515**
Continues to provide an understanding of the basic principles and mechanisms of disease, including: inflammation and repair; degeneration; hemodynamic disturbances; developmental defects; and neoplasia. This level of understanding will be applied in addressing disease states amenable to pharmacist intervention. In addition, medical terminology will be learned and applied to the course content.

**Pharmacy Practice I (1) PHRM 516**
Provides an overview of the pharmacy profession and the history of pharmacy as well as discussion surrounding what it means to be a professional (including but not limited to issues of ethics, cultural competency and emotional intelligence). Pharmacy law, as it relates to the IPPE courses, will be introduced to the student. Student participation in the Jefferson Health Mentors Program will be encompassed within this course series.

**Pharmacy Practice II (1) PHRM 517**
Provides an overview of the role of the pharmacy profession relative to different areas of practice and in the role as advocate for healthcare. Continued reflection regarding what it means to be a professional will occur. Other social and behavioral aspects of pharmacy will be addressed through class discussions and the Jefferson Health Mentors program and will include patient and other healthcare provider perceptions of pharmacists’ capabilities, role of the pharmacist related to patient care, and role of the pharmacist related to interaction with other healthcare providers.
Physical Assessment and Clinical Skills (3) PHRM 526
Physical assessment and clinical skills provides the student with knowledge and preliminary application of the skills necessary for obtaining a comprehensive patient history and problem identification. Students will learn to design patient-centered, culturally relevant pharmacy care plans and appreciate the role of these plans in patient care. Students will learn and perform basic assessment techniques and the skills necessary for triage and referral. This course will also provide an introduction to the role of home diagnostic and monitoring devices in the diagnosis, staging, and monitoring of various disease states.

Preventive Healthcare and Self-Care Issues (2) PHRM 512
This course focuses on disease prevention and wellness promotion through health risk assessment, lifestyle modification, and the use of other nonpharmacologic therapies. It evaluates the role of nonprescription drug therapies and dietary supplements in preventive healthcare and patient self-care.

Second Year

Biopharmaceutics and Principles of Clinical Pharmacokinetics (3) PHRM 535
The fate of a medication in the body is determined by several key factors that include the dosage form or delivery system, the route of administration or site of delivery, the chemical structure of the active ingredient, and the functional status of the patient’s biological systems. Dissecting and modeling the interplay among these factors is the purview of biopharmaceutics and pharmacokinetics. The knowledge and algorithms derived from such exercises are routinely applied to facilitate dosage form design, to predict medication dosing regimens, and to optimize treatment protocols for individual patients based on their specific profiles. This course is designed to include key mathematical, physicochemical, and biological principles that govern the fate of a dosage form or its active ingredient as it traverses the many varied barriers between the site of administration, the site of action, and the site and mode of elimination. Learning activities in the course consist primarily of lectures, discussions, and problem-solving exercises or assignments.

Clinical Diagnosis/Pharmacotherapy I: Introductory Pharmacotherapy Principles/Endocrine Module (2) PHRM 554
This is the first course in the series that builds upon knowledge and skills that have been acquired in Medicinal Chemistry, Pharmacology I, Pathophysiology I and II, Physical Assessment and Clinical Skills, and other basic and clinical science courses. This course will introduce basic therapeutic principles and allow the learner to develop and apply critical thinking skills toward the management of patients with endocrine disorders. The course is designed to have an active learning focus via
case-based discussions. Students will be provided patient cases to work up covering therapeutic principles, and endocrine disorders. Students will utilize the instructional resources (e.g. textbook, journal articles, guidelines, etc) and come prepared to actively engage in the in-class discussion. At the conclusion of this course, the learner will have a firm knowledge base in basic therapeutic principles, and diagnosis and clinical management of patients with common endocrine disorders.

Clinical Diagnosis/Pharmacotherapy II: Renal and Gastrointestinal Module (2) PHRM555
This is the second course in the series that builds upon knowledge and skills that have been acquired in Medicinal Chemistry, Pharmacology I and II, Pathophysiology I and II, and other basic and clinical science courses. This course will allow the learner to develop and apply critical thinking skills toward the management of patients with renal disorders, gastrointestinal disorders, and psoriasis. The course is designed to have an active learning focus via case-based discussions and team-based learning exercises. Students will be provided patient cases to work up and will utilize the instructional resources (e.g. textbook, journal articles, guidelines, etc) to work through the cases prior to class and come prepared to actively engage in the in-class discussion. At the conclusion of this course, the learner will have a firm knowledge base in the diagnosis and clinical management of patients with common renal disorders, gastrointestinal disorders, and psoriasis.

Drug Information and Literature Evaluation (3) PHRM 527
Emphasizes the skills needed to develop drug information for dissemination to health care providers. Emphasizes the types of drug information available, what sources are appropriate to use in a variety of situations and the strengths and weaknesses of different sources. Provides the knowledge and skills necessary to evaluate clinical trials that validate treatment usefulness, to apply evidence-based decision making to patient care and develop guidelines.

The course provides an overview of how medical information skills are applicable, and necessary, in various settings. Examples include medical information in the pharmaceutical Industry, development of evidence-based guidelines, application of informatics to facilitate guideline adherence, key points to secure when responding to a specific question type such as drug use in pregnancy, and newer information sources such as mobile apps and social media.

IPPE: Hospital Pharmacy (1) PHRM 528
The purpose of the course is to instill a basic understanding of hospital pharmacy practice through site-based experiences.
The course is conducted in hospital pharmacy settings located in Philadelphia or its surrounding counties. Experience at the site may incorporate knowledge gained and skills and attitudes developed in the P1 and P2 coursework.

**IPPE: Ambulatory Care (1) PHRM 537**
The purpose of the course is to instill a basic understanding of ambulatory care pharmacy practice through both site-based and simulated experiences.

The course is offered in two individual components. One half of the course is conducted in ambulatory care settings located in Philadelphia or its surrounding counties. The remaining half of the course is conducted in the Pharmacy Practice Simulation Center. Course experiences may incorporate knowledge gained and skills and attitudes developed in the P1 and P2 didactic coursework, as well as in the IPPE I, II and III experiences; depending upon which semester IPPE IV and the above courses are taken.

**Medication Safety (2) PHRM 529**
This course will provide students with an understanding of the basic safety principles employed in the medication-use process. These principles include the following: understanding systems thinking; identifying the types and causes of medication errors; developing strategies for improving the medication-use process; and defining the role of medication safety resources and reporting systems.

**Pharmaceutical Calculations (2) PHRM521**
This course will introduce pharmacy students to the calculations commonly used in pharmacy practice. The knowledge and skills learned in this course will prepare students to apply calculation problem solving skills to clinical practice. Topics discussed will focus on the pharmaceutical and clinical calculations that are critical to the safe and effective delivery of medications to the patient.

**Pharmaceutics and Drug Delivery Systems (3) PHRM 530**
Pharmaceutics deals with the formulation, preparation, preservation, and dispensing of medications and related therapeutic devices. A successful dosage form or drug delivery system must ensure the effective, reliable, and safe delivery of the drug to its site of action in the body. The course will explore the many physical, chemical, engineering, organoleptic, and esthetic principles involved in dosage form design and preparation. From tablets and capsules to syrups and injectables, the student will gain an in-depth appreciation of the role of dosage form characteristics relative to the route of administration in drug therapy decisions. Learning activities in the course consist of lectures, problem-solving exercises, and quizzes with feedback review.
**Pharmaceutics Laboratory (1) PHRM 531**
This course will introduce the student to the dosage forms utilized by today’s compounding pharmacists and will provide students with an understanding of the prescription and pharmaceutical calculations, including the metric and common systems of measurement, calculation of doses, and various methods of expressing the strength of pharmaceuticals. Upon completion of this course, students should be able to perform correctly the calculations required to prepare a medication order properly.

A range of dosage forms will be discussed and prepared, with an emphasis on formulation, preparation and presentation of solid, semi-solid and liquid dosage forms with a specific focus on blends and mixtures (capsules, suppositories, troches, solutions and dispersions; emulsions and suspensions) for oral, rectal, vaginal, topical and transdermal routes of delivery.

**Pharmacology II (3) PHRM 556**
Pharmacology II will be the second course in this series; it will provide an understanding of drug action in the context of human physiology, biochemistry, and pathophysiology. Pharmacology II will encompass the pharmacology of bacterial and mycobacterial infections, autonomic pharmacology, and cardiovascular pharmacology. Pharmacology of bacterial infections will include cell wall synthesis inhibitors, DNA replication inhibitors, and protein synthesis inhibitors. Autonomic Pharmacology will include an overview of the autonomic nervous system (sympathetic and parasympathetic), and adrenergic and cholinergic 2 pharmacology. Cardiovascular pharmacology will include an overview of cardiac, vascular, and renal physiology, as they relate to the control of cardiovascular function, and the mechanisms of action of drugs used to treat cardiovascular disorders. Learning activities in the course consist primarily of lectures, technology-assisted discussions, problem-solving exercises, in-class quizzes and team-based learning.

**Pharmacy Management: Theory and Applications (3) PHRM 533**
This course will enable students to apply management principles (planning, organizing, directing and controlling resources) to various pharmacy practice settings. It provides an introduction to marketing principles, basic accounting principles, project management issues, managing and improving the medication-use process, and topics related to healthcare improvement mechanisms at the micro- and macro-system levels.
**Pharmacy Practice III (1) PHRM 534**
The 3\textsuperscript{rd} course in a 4 course series, Pharmacy Practice III will include continued reflection regarding what it means to be a professional with further discussion and exercises focusing on broad issues including cultural competency and emotional intelligence as well presentations by individuals practicing in a variety of pharmacy environments. Other social and behavioral aspects of pharmacy will be addressed through class discussions and the Jefferson Health Mentors program. The course will provide a continuation of pharmacy current event topics.

**Pharmacy Practice IV (1) PHRM 538**
The fourth course in a 4 course series, Pharmacy Practice IV will include continued focus on professional development with further discussion and exercises surrounding bioethics, patient safety, cultural competency and emotional intelligence. Presentations by individuals practicing in a variety of pharmacy environments will continue. Other social and behavioral aspects of pharmacy will be addressed through class discussions and the Jefferson Health Mentors program. Contemporary issues in pharmacy practice will also be discussed and evaluated.

**Pharmacy Practice Laboratory I (1) PHRM 542**
This course will expand the student’s pharmacotherapeutic foundation of knowledge by incorporating active learning experiences and reinforcing skills related to clinical and physical assessment. Students will also learn and perform aseptic technique. In addition, it will further increase the student’s level of experience relative to written and verbal communication skills and introduce them to new pharmacy skills where applicable.

**Third Year**

**Clinical Diagnosis/Pharmacotherapy III: Cardiovascular Module (3) PHRM 557**
This is the third course in the series that builds upon knowledge and skills that have been acquired in Medicinal Chemistry, Pharmacology I and II, Pathophysiology I and II, Physical Assessment and Clinical Skills and other basic and clinical science courses. This course will allow the learner to develop and apply critical thinking skills toward the management of patients with cardiovascular and pulmonary disorders. The course is designed to have an active learning focus via case-based discussions. Students will be provided patient cases to work-up covering cardiovascular and pulmonary disorders. Students will utilize the instructional resources (e.g. textbook, journal articles, guidelines, etc) to work through the cases prior to class and come prepared to actively engage during the in-class discussion. At
the conclusion of this course, the learner will have a firm knowledge base in the
diagnosis and clinical management of patients with common cardiovascular and
pulmonary disorders.

Clinical Diagnosis/Pharmacotherapy IV: Infectious Diseases Module (3)
PHRM 544
This is the fourth course in the series that builds upon knowledge and skills that have
been acquired in Medicinal Chemistry, Pharmacology I, Pathophysiology I and II,
and other basic and clinical science courses. This course will allow the learner to
develop and apply critical thinking skills toward the management of patients with
infectious diseases. The course is designed to be active learning via case-based
discussions. Students will be provided patient cases to work up covering infectious
diseases. Students will utilize the instructional resources (e.g. textbook, journal
articles, guidelines, etc) to work through the cases prior to class and come prepared
to actively engage in the in-class discussion. At the conclusion of this course, the
learner will have a firm knowledge base in the diagnosis and clinical management of
patients with common infectious diseases.

Clinical Diagnosis/Pharmacotherapy V: Neurology-Psychology Module (3)
PHRM 546
This is the fifth course in the series that builds upon knowledge and skills that have
been acquired in Medicinal Chemistry, Pharmacology III, Pathophysiology I and II,
other basic and clinical science courses, and Clinical Diagnosis/Pharmacotherapy
I-IV. This course will allow the learner to develop and apply critical thinking skills
toward the management of patients with neurologic and psychiatric disorders. The
course is designed to include active learning via case-based discussions. Students
will be provided patient cases to work up covering neurologic and psychiatric
disorders. Students will utilize the instructional resources (e.g. textbook, journal
articles, guidelines, etc) to work through the cases prior to class and come prepared
to actively engage in the in-class discussion. At the conclusion of this course, the
learner will have a firm knowledge base in the diagnosis and clinical management of
patients with common neurologic and psychiatric disorders.

Clinical Diagnosis/Pharmacotherapy VI: Oncology Module (3) PHRM 547
This is the sixth course in the Clinical Diagnosis/Pharmacotherapy series that builds
upon knowledge and skills acquired in Medicinal Chemistry, Pharmacology III,
Pathophysiology I and II, and other basic and clinical science courses. This course
will allow the learner to develop and apply critical thinking skills toward the
management cancer patients. The course is designed to be active learning via
case-based discussions. Students will be provided patient cases to work up covering
oncology diseases. Students will utilize the instructional resources (e.g. textbook,
journal articles, guidelines, etc) to work through the cases prior to class and come
prepared to actively engage in the in-class discussion. At the conclusion of this course, the learner will have a firm knowledge base in the diagnosis, clinical treatment and supportive care management of cancer patients.

**Integrated Practice Applications (1) PHRM 552**
This course will serve as the capstone course to the P1 through P3 curriculum. Throughout the semester, students will utilize the knowledge and skills obtained throughout the curriculum to date to perform comprehensive activities. Students will practice a comprehensive approach (clinical, social, administrative) to solving integrated problems and cases throughout the semester with frequent instructor feedback.

**IPPE: Direct Inpatient Care (2) PHRM 558**
The purpose of the course is to instill a basic understanding of direct inpatient care pharmacy practice through site-based experiences. The course is conducted in hospitals located in Philadelphia and its surrounding counties. Experience at the site may incorporate knowledge gained and skills and attitudes developed in the P1 and P2 coursework; as well as the ongoing P3 coursework.

**IPPE: Elective (2) PHRM 568**
The purpose of the course is to provide students with an expanded awareness and understanding of potential career opportunities within the pharmacy profession. Through participation in this IPPE, students can explore an area of pharmacy practice in which they have a personal interest.

The course is conducted in a variety of pharmacy settings located in Philadelphia and its surrounding counties. Selective sites include a wide range of patient care practices.

**Pharmacology III: Neuropsychopharmacology and Cancer Chemotherapeutics (3) PHRM 539**
Pharmacology III focuses on drugs effective for the chemotherapy, biological and hormonal therapies for cancer, drugs applicable for the treatment of neurological and psychiatric disorders, and abusable drugs that modulate normal ranges of behavior. The neuropharmacology section begins with a review of the structures 2 and mediators that play key roles in various brain functions, identifies neurochemical opportunities for pharmacologically targeting associated brain dysfunctions, and describes the properties of various classes of agents in current use. The cancer pharmacology section will begin with common classification of anti-cancer agents, followed by introduction of each class of anti-cancer agents. Students will gain an understanding of the mechanisms of therapeutic and adverse actions of drugs.
Pharmacoeconomics and Health Outcomes (3) PHRM 551
Covers the science of pharmacoeconomics including design, methods, and analysis; discusses the context and uses of pharmacoeconomic analysis in U.S. healthcare decision making from various perspectives; explains global application of pharmacoeconomics to inform pharmaceutical reimbursement policies and decisions.

Interprofessional Grand Rounds (2) PHRM 550
Students in this interprofessional course evaluate the influence of current public health and psychosocial issues on the United States healthcare system. Topics of discussion include evidence-based decision making as it relates to patient preference and provider autonomy, healthcare and team communication, patient safety and error reduction, use of technologies in health care and end of life care. Students address these issues incorporating aspects that may include but are not be limited to principles of professional behavior and ethical issues in delivery of patient-centered care.

Pharmacy Practice Laboratory II (1) PHRM 545
This course will expand the student’s pharmacotherapeutic foundation by incorporating active learning experiences and reinforcing skills related to clinical and physical assessment. In addition, it will further increase the student’s level of experience relative to written and verbal communication skills and introduce them to new pharmacy skills where applicable. Students will also learn and perform immunization administration and are expected to earn an APhA Pharmacy-Based Immunization Delivery Program certificate.

Pharmacy Practice Laboratory III (1) PHRM 548
This course will expand and reinforce the student’s pharmacotherapeutic foundation of knowledge by incorporating active learning experiences and skills related to clinical and physical assessment. In addition, it will further increase the student’s level of experience relative to verbal and written communication skills and introduce them to new pharmacy skills where applicable. Students are also expected to begin the process of earning an American Pharmacists’ Association (APhA) Delivery Medication Therapy Management Services certificate.

Professional Seminar I (2) PHRM 553
The student will assess, develop, and present an individual presentation focusing on a specific pharmacotherapeutic topic. The course will emphasize critical thinking and effective verbal communication skills and allow students to apply biostatistics and literature evaluation skills.
Pharmacy Law (1) PHRM 610
This online course provides a comprehensive overview of pharmacy law, with a special focus on the laws and regulations affecting the day-to-day practice of pharmacy. This course will not only allow the learner to understand the interrelationship of federal and state laws and regulations affecting the practice of pharmacy, but also permit the learner to apply this knowledge in being able to research legal issues as they occur in daily practice. The course will also facilitate the development and application of problem-solving skills based on scenario-based pharmacy management issues presented during class. This course will cover in depth the 2 main laws and related regulations affecting the practice of pharmacy, namely the Food Drug and Cosmetic Act and the Controlled Substance Act. The course will also provide a solid understanding of the Pennsylvania Pharmacy Act and Pharmacy regulations (Title 49, Chapter 27; Title 28, Chapter 25). The course will also cover relevant aspects of Omnibus Budget and Reconciliation Act (OBRA 90), Health Insurance Portability & Accountability Act (HIPAA), and malpractice liability.

Fourth Year

APPE: Community Pharmacy (6) PHRM 630
The purpose of the course is to provide students with the opportunity to apply, reinforce, and advance the knowledge, skills, attitudes, and values developed throughout the P1, P2, and P3 curriculum. The course is conducted in community pharmacies. Emphasis is placed on the student’s ability to recall and apply knowledge and skills applicable to the community pharmacy practice environment and to demonstrate attitudes and values expected of pharmacists in this environment. The accurate and safe interpretation, processing, and dispensing of prescriptions including the resolution of any problems and the provision of patient education comprises a major component of this course. Key activities include those detailed in the Pharmacists’ Patient Care Process; notably, processing and dispensing prescriptions (plan and implement) in compliance with applicable laws and regulations, interviewing (collect) and educating (implement) patients, monitoring adherence and response to prescribed medication (follow-up), advising patients on the use of over-the-counter products (collect, assess, implement), complementary medication, and healthy lifestyle choices (implement).

APPE: Hospital Pharmacy (6) PHRM 640
The purpose of the course is to provide students with the opportunity to demonstrate their ability to reinforce, apply, and advance the knowledge, skills, attitudes and values developed throughout the P1, P2, and P3 curriculum. The course is
coordinated within hospital pharmacies. Emphasis is placed on the student’s ability to effectively participate in a broad spectrum of activities encompassed within the job responsibilities of contemporary hospital pharmacists. Key activities include those detailed within the Pharmacists’ Patient Care Process; notably, medication order processing, safe medication storage and distribution, medication safety, responding to requests for information about medications, and participating in inter-professional decision-making processes.

**APPE: Ambulatory Care (6) PHRM 650**

The purpose of the course is to provide students with the opportunity to apply, reinforce and advance the knowledge, skills, attitudes, and values developed throughout the P1, P2, and P3 curriculum. The course is conducted in ambulatory care and transitional care facilities. Emphasis is placed on the student’s ability to recall and apply knowledge and skills applicable to the ambulatory care practice environment and to demonstrate attitudes and values expected of pharmacists in this environment. Management of chronic medical conditions that are treated pharmacologically account for a major component of disease states seen. Key activities include those detailed within the Pharmacists’ Patient Care Process; notably, interviewing patients (collect), performing basic physical assessment (collect), monitoring patient response to prescribed medication (assess/evaluate), developing evidence-based pharmacy care plans (plan), educating patients (implement), and participating in the inter-professional decision-making process (plan/implement/evaluate), and responding to requests for drug information.

**APPE: Direct Inpatient Care (6) PHRM 660**

The purpose of the course is to provide students with the opportunity to apply, reinforce and advance the knowledge, skills, attitudes and values developed throughout the P1, P2, and P3 curriculum. The course is conducted in patient care areas of hospitals. Emphasis is placed on the student’s ability to recall and apply knowledge and skills needed to effectively participate in the patient care decision-making process, functioning as an integral member of an inter-professional, inpatient healthcare team. The most commonly encountered medical conditions include cardiovascular disorders, diabetes, infectious diseases, pulmonary disorders, and renal and hepatic dysfunction. Key activities include those detailed within the Pharmacists’ Patient Care Process (PPCP); notably, retrieval (collect) and assessment (plan/interpret) of pertinent information contained within patients’ medical records, development (plan/implement) and monitoring (evaluating/follow-up) of pharmaceutical care plans, participating in the inter-professional decision-making process (plan/implement), and providing drug information.
APPE: Direct Patient Care Elective (6) PHRM 670
The purpose of the course is to provide students with the opportunity to apply, reinforce and advance the knowledge, skills, attitudes and values developed throughout the P1, P2, and P3 curriculum. The course is conducted in patient care settings. Common types of sites include, but are not limited to: acute (inpatient) care, ambulatory care, community pharmacies, compounding and specialty pharmacies, and transitional care and rehabilitation facilities. Emphasis is placed on the student’s ability to effectively participate in the patient care decision making process, functioning as an integral member of an inter-professional healthcare team. The most commonly encountered pharmacist responsibilities and the common medical conditions will be dependent upon the nature of the patient care site. Key activities include those detailed in the Pharmacists’ Patient Care Process (PPCP); notably, collection, assessment, and maintenance of pertinent patient information, development and monitoring of care plans, accurate preparation and dispensing of medications to patients or caregivers, participating in the inter-professional decision-making process, and responding to requests for drug information.

APPE: Open Elective (6) PHRM 680
The purpose of the course is to provide students with the opportunity to apply, reinforce and advance the knowledge, skills, attitudes and values developed throughout the P1, P2, and P3 curriculum. The course is conducted in sites whose activities impact patient care; but do not necessarily provide direct patient care. Common types of sites include, but are not limited to management, drug information, academia, research, pharmaceutical industry, medical communication firms, managed care organizations, etc. Emphasis is placed on the student’s ability to effectively participate in the site’s activities, functioning as an integral member of the site’s team in the role(s) assigned to the pharmacist(s) at that site.

Professional Seminar II (2) PHRM 620
Clearly, healthcare is constantly changing. Even as you are about to graduate there are new drugs being approved, new guidelines being published, new ways of practice being established, new issues being identified at the level of the patient, community, region, nation and world. Changes in healthcare usually occur to bridge practice gaps which the Agency for Healthcare Research & Quality (AHRQ) defines as the difference between health care processes or outcomes observed in practice, and those potentially achievable on the basis of current professional knowledge.

Students will prepare a short, concise presentation utilizing a structured process similar to creating a knowledge-based continuing pharmacy education activity or presenting at a regional or national meeting. Students will choose a contemporary pharmacy-related issue or “hot topic”, develop appropriate learning objectives, compose a needs assessment, create and deliver a recorded webinar. The course will emphasize critical thinking and effective communication skills allowing students to
deliver a structured educational activity that is designed to support the continuing professional development of pharmacists and student pharmacists.

**JCP ELECTIVE COURSES**

**Global Health and Infectious Diseases (2) PHRM 560**
This course will provide students with an understanding of the concepts of global health, epidemiology, and emerging and reemerging infectious diseases in various areas of the world.

**Creating Pharmacy Leaders (2) PHRM 561**
This course is designed to provide insight into management and leadership knowledge and skills that may be applied throughout one’s career. The student will also become familiar with characteristics common amongst leaders and apply leadership skills learned.

**Cardiovascular Primary Literature Review (3) PHRM 562**
This course reviews major, noteworthy trials, from primary sources, that are responsible for supporting common cardiovascular-related therapeutic practices and decision making in an ambulatory care setting. Advanced primary literature evaluation skills, evidenced-based medicine practices, and real-world application of trial results will be emphasized. Correlation will be made between current therapeutic guidelines, trial design, and the clinical data.

**Women’s Health – From Historical Perspectives to Medical Interventions (3) PHRM 563**
This elective course will introduce and build upon the P3 pharmacy student’s knowledge relative to women’s health topics across the lifespan. Using an evidence-based approach, the optimization of women’s health will be presented and discussed. Course topics may include, but are not limited to: the history of women in clinical trials; health disparities based upon gender; the role of gender in affecting the healthcare system; the importance/role of well-care screenings specific to women; drug therapy management and decisions related to pregnancy and lactation; thromboembolic disorders in women; the female athlete triad; menstruation-related disorders; endometriosis; and cardiovascular disease in women.
Current Topics in Cardiovascular Disease: An Evidence-Based Discussion (3)  
PHRM 564  
This course reviews contemporary noteworthy trials, from primary sources, that are responsible for supporting cardiovascular and/or type 2 diabetes related therapeutic practices and decision making. Specifically, this course will have an emphasis on trials that have been published within the past 2-3 years. Advanced primary literature evaluation skills, evidenced-based medicine practices, and real-world application of trial results will be emphasized. Correlation will be made between current therapeutic guidelines, trial design, and the clinical data.

Pediatric Pharmacotherapy (2) PHRM 565  
This course is designed to expand the student’s current knowledge base regarding the pediatric population and to introduce the core concepts involved in the care of special populations. The course is provided to prepare students to identify and address drug related problems in pediatric patients and to demonstrate competency within those areas. In addition, medical terminology will be learned and applied to the course content.

Advanced Pharmacology (2) PHRM 567  
Targeted at a select group of students aspiring to advanced education in pharmacotherapy, clinical pharmacology, or pharmacological research, the course will expose the participants to evidence-based methods of reading and analyzing the primary literature in the pharmaceutical sciences. Students will gain competencies necessary to identify the goals of an experimental study, appreciate the methods used, analyze the data presented, and draw appropriate conclusions based on the strength and reliability of the evidence. Class sessions will analyze and discuss one or two primary publications relevant to drug mechanisms, actions, formulation, and/or uses. Each session will be facilitated by a faculty who is expert in the major areas covered in the session.

Critical Care Pharmacotherapy (2) PHRM 570  
The purpose of this course is to introduce students to the field of critical care pharmacy practice. Students will learn how to approach the care of a critically ill patient and will explore topics such as sedation and analgesia, medical emergencies, toxicology, mechanical ventilation and end-of-life care.

Diabetes Immersion (2) PHRM 571  
The purpose of this course is to provide the students with the opportunity to learn in-depth knowledge of diabetes through active, hands-on learning. As a required part of this course, students will participate in a week long experience of living with diabetes in which they will give “insulin” injections and check blood glucose 4 times
per day. Students will also have the opportunity to visit a dialysis unit, meet patients living with diabetes, and participate in diabetes education to the community.

**Academic Pharmacy (2) PHRM 572**

This course will introduce the pharmacy student to the three components of pharmacy academia: teaching, scholarly activity and service. Several weeks of the course will be devoted to each of these three components with the students participating in activities representative of what faculty do relative to each component. The activities will include: the development of a teaching philosophy and a classroom experience; participation in peer evaluation of teaching; and reflection on their personal learning style and strengths relative to academia.

**Advanced Infectious Diseases (2) PHRM 573**

This course will provide students with an understanding of advanced topics in infectious diseases, beyond Clinical Diagnosis and Pharmacotherapy IV. The course will focus on infectious diseases in the acute care setting as well as the management of HIV infection including HIV-related complications. Students will explore topics such as pathogen identification and reporting, antimicrobial stewardship, infection control, multi-drug resistant organisms, opportunistic infections, pre-exposure prophylaxis for HIV infection, hepatitis C infection, and the modification of antiretroviral treatment regimens. The course will emphasize the application of guidelines and primary literature in case-based discussions.

**Pharmacogenomics (2) PHRM 574**

This class will provide in depth evaluation of methodologies used in pharmacogenomics and the role of genetics in treating diseases. Through readings, lecture, student presentations and discussion, each class will focus on pharmacogenomics applications in diseases like cardiac, cancer and diabetes.

**Introduction to Nuclear Pharmacy (2) PHRM 575**

Introduction to Nuclear Pharmacy course is designed to review basic concepts of radioactive decay, production of radionuclides, radiation detection and measurement. Basic principles applicable to instrumentation, the design of diagnostic imaging drugs, and clinical concepts will be highlighted. Application of radiopharmaceuticals in diagnosis and treatment of diseases will be emphasized. Participants will examine the role of a nuclear pharmacist and understand the regulatory requirements under which they operate. Learning activities in the course will consist of lectures, problem-solving exercises, and a visit to a Nuclear Pharmacy.
Introduction to Community Pharmacy (2) PHRM 576
The Introduction to Community Pharmacy Practice Elective will provide in-depth discussions of the workings of community pharmacy. Emphasis will be on developing and/or enhancing the skill set needed to handle the dynamic issues facing community pharmacists. The course is designed to facilitate the transition from student to registered pharmacist in a community pharmacy setting.

Drug Discovery (2) PHRM 577
This course focuses on understanding the process that leads to discovering new drugs. The course covers an understanding of FDA and introduction to various pre-clinical and clinical studies and steps for the FDA approval process. The class will cover an understanding of the drugs that are in different phases of drug development process for many diseases. The course will be an in depth study of the current concepts and literature on specific areas in drug discovery.

Introduction to Organization Development and Leadership (2) PHRM 578
This course will offer an introduction to organizational development and leadership (ODL) theory. ODL fosters an understanding of organizational dynamics and the potential for each individual to utilize their strengths to positively influence change and offer leadership in the workplace or professional setting. The course will focus on emotional systems theory, appreciative inquiry, and systems literacy. Emotional systems focuses on Bowen’s family systems theory to allow students to better manage their emotional reactivity and develop an objective perspective on how emotional systems operate. Appreciative inquiry is a method of discovering what is the positive core of each situation and helps students imagine what magnifying the best possibilities would do to their personal and professional lives. Systems literacy allows the student to analyze systemic conditions to better understand what is needed to create outstanding opportunity to become a leader at any organizational level. Students will learn techniques on how to use their strengths to their overall personal and professional benefit through classroom discussion, reflection, and presentations.

Special Topics in Ambulatory Care (2) PHRM 579
The focus of this course is on the evolving role of the ambulatory care pharmacist in delivering patient centered care. It combines advanced clinical decision making for chronic disease states with practice based management through policy and procedure development. Students will explore methods to implement new pharmacy services and to build an outpatient practice through interactive discussions, case-based learning, and technology. Additionally, students will have the opportunity to learn from their peers as they evaluate primary literature and research/present controversial clinical topics in ambulatory care.
Advanced Drug Metabolism (2) PHRM 580
This course offers a detailed mechanistic approach to drug metabolism starting with basic metabolic routes for various drug functional groups. This course provides an in depth study of phase I and phase II reactions and important enzymes focusing on highly prescribed FDA approved drugs. Detailed preclinical studies of drug candidate metabolism are essential to drug development. The course will utilize literature examples of structural modification strategies to modulate drug metabolism and ADMET properties in lead optimization. The course is designed to utilize and apply basic chemical concepts that govern drug action, general principles of medicinal chemistry, and chemical characteristics of selected drug classes.

Pharmaceutical Biotechnology in Drug Development (2) PHRM 581
This course focuses on understanding the technologies that required for the development, production, and manufacture of biological drugs. This class will introduce students to the molecular principles, methods and advanced developmental techniques utilized in the production of therapeutic proteins, hormones, antibodies, and DNA based vaccines. Pharmaceutical delivery methods with an emphasis on controlled release formulations will also be focused in this course. The roles of economic considerations, regulatory issues and the approval of biopharmaceuticals will also be incorporated throughout the course as applicable.

Independent Study (credit variable) PHRM599
This course consists of one on one work between a JSP student and faculty member. The faculty member and student mutually develop the goals, objectives and assessments for the completion of the course. Depending upon the workload agreed to, credits may range from 1-3 per semester.

Non-JCP Electives
A number of non-JCP courses have been approved as counting towards a student’s requisite number of elective courses. These are offered through the Jefferson College of Population Health (PBH prefixed), the Jefferson College of Biomedical Sciences (GC prefixed) and the Jefferson College of Health Professions (Occupational Therapy Program, OT prefixed). These include:

- Introduction to Public Health (3), PBH501
- Social and Behavioral Foundations of Public Health (3), PBH502
- Health Communication and Social Marketing (3), PBH511
- Cultural Humility and Competence in Health Professions and Population Health (3), PBH515
- Special Populations in Environmental Health (3), PBH517
- Healthcare Quality and Safety Measurement and Outcomes Analysis (3), GC515
- Health Literacy in Traditional and Emerging Practice Environments (3), OT797