

Brief Description of Didactic and Experiential Courses

Experiential Sequence

Introduction to Pharmacy Practice (P-1 fall): This course focuses on preparing students for the introductory pharmacy practice experiences. Students spend the semester obtaining the necessary preparation required for experiential learning. Examples include training and certification in cardiopulmonary resuscitation, APhA's Pharmacy-Based Immunization Delivery, Health Insurance Portability and Accountability Act (HIPAA), and Occupational Safety & Healthcare Administration (OSHA). Elements of professionalism are strongly emphasized in this course, specifically elements of professional communications, interactions, and behaviors. The experiential learning preparatory course also includes an introduction to healthcare documentation and drug information.

Introductory Pharmacy Practice Experience 1 (P-1 spring): Introductory pharmacy practice experiences include various real practice experiences in community, institutional, or other pharmacy setting. Introductory Pharmacy Practice Experience I is the first of five courses that begin the spring semester of the first professional year and continue through the end of the third professional year. In the Introductory Pharmacy Practice Experience I course students are assigned to an institutional learning opportunity within the community. During each semester-long experience, students spend 3 hours twice weekly at their assigned experiential site where they learn about the institutional pharmacy practice setting and complete specific assignments that emphasize the concepts that they are learning in their concurrent course work.

Introductory Pharmacy Practice Experience 2 (P-2 fall): Introductory pharmacy practice experiences include various real practice experiences in community, institutional, or other pharmacy setting. Introductory Pharmacy Practice Experience II is the second of five courses that begin the spring semester of the first professional year and continue through the end of the third professional year. In the Introductory Pharmacy Practice Experience II course students are assigned to a community pharmacy learning opportunity (chain pharmacy or independent) within the local community. During each semester-long experience, students spend 3 hours twice weekly at their assigned experiential site where they learn about the community pharmacy practice setting and complete specific assignments that emphasize the concepts that they are learning in their concurrent course work.

Introductory Pharmacy Practice Experience 3 (P-2 spring): Introductory pharmacy practice experiences include various real practice experiences in community, institutional, or other pharmacy setting. Introductory Pharmacy Practice Experience III is the third of five courses that begin the spring semester of the first professional year and continue through the end of the third professional year. In the Introductory Pharmacy Practice Experience III course students are assigned to a second community pharmacy learning opportunity (chain pharmacy or independent) within the local community. During each semester-long experience, students spend 3 hours twice weekly at their assigned experiential site where they learn about the community pharmacy practice setting and complete specific assignments that emphasize the concepts that they are learning in their concurrent course work.

Introductory Pharmacy Practice Experience 4 (P-3 fall): Introductory pharmacy practice experiences include various real practice experiences in community, institutional, or other pharmacy setting. Introductory Pharmacy Practice Experience IV is the fourth of five courses that begin the spring semester of the first professional year and continue through the end of the third professional year. In the Introductory Pharmacy Practice Experience IV course students are assigned to an elective pharmacy learning opportunity within the local community. During each semester-long experience, students spend 3 hours twice weekly at their assigned experiential site where they learn about their assigned pharmacy practice setting and complete specific assignments that emphasize the concepts that they are learning in their concurrent course work.

Introductory Pharmacy Practice Experience 5 (P-3 spring): Introductory pharmacy practice experiences include various real practice experiences in community, institutional, or other pharmacy setting. Introductory Pharmacy Practice Experience V is the last of five courses that begin the spring semester of the first professional year and continue through the end of the third professional year. In the Introductory Pharmacy Practice Experience V course students are assigned to a second elective pharmacy learning opportunity within the local community. During each semester-long experience, students spend 3 hours twice weekly at their assigned experiential site where they learn about the their assigned pharmacy practice setting and complete specific assignments that emphasize the concepts that they learn in their concurrent course work.

Advanced Pharmacy Practice Experience – Community (P-3 summer or P-4): Advanced pharmacy practice experiences are primarily direct patient care experiences that build on the introductory experiences. Each experience is a full-time commitment of eight hours each day, five days a week, lasting six weeks. Students are required to complete seven, six-week experiences in their fourth year. The Community Advanced Pharmacy Practice Experience is designed to expand students' knowledge and further develop the practice skills needed to perform activities commonly encountered in a community pharmacy practice setting. Activities commonly included in this experience include: evaluating and dispensing medication orders, counseling patients, recommending appropriate therapy and alternative treatments, managing medication histories, and participating in disease specific health screenings.

Advanced Pharmacy Practice Experience – Institutional (P-3 summer or P-4): Advanced pharmacy practice experiences are primarily direct patient care experiences that build on the introductory experiences. Each experience is a full-time commitment of eight hours each day, five days a week, lasting six weeks. Students are required to complete seven, six-week experiences in their fourth year. The Institutional Advanced Pharmacy Practice Experience is designed to expand students' knowledge and further develop the practice skills needed to perform activities commonly encountered in institutional (hospital) pharmacy practice setting. Activities commonly included in this experience include: medication dispensing, evaluating medication orders, creating pharmaceutical care plans, counseling patients, and taking/documenting medication histories.

Advanced Pharmacy Practice Experience – Ambulatory Care (P-3 summer or P-4): Advanced pharmacy practice experiences are primarily direct patient care experiences that build on the introductory experiences. Each experience is a full-time commitment of eight hours each day, five days a week, lasting six weeks. Students are required to complete seven, six-week experiences in their fourth year. The Ambulatory Care Advanced Pharmacy Practice Experience is designed to expand students' knowledge and further develop the practice skills needed to perform activities commonly encountered in ambulatory care pharmacy practice setting. Activities commonly included in this experience include: obtaining patient medical and medication histories, evaluating drug therapies, developing pharmacy care plans, monitoring therapeutic outcomes, interacting with other healthcare providers, and providing education to patients and other health care professionals.

Advanced Pharmacy Practice Experience – Acute Care Internal Medicine (P-3 summer or P-4): Advanced pharmacy practice experiences are primarily direct patient care experiences that build on the introductory experiences. Each experience is a full-time commitment of eight hours each day, five days a week, lasting six weeks. Students are required to complete seven, six-week experiences in their fourth year. The Acute Care/Internal Medicine Advanced Pharmacy Practice Experience is designed to expand students' knowledge and further develop the practice skills needed to perform activities commonly encountered in an internal medicine pharmacy practice setting. Activities commonly included in this experience include: practicing as part of an interprofessional team, obtaining patient medical and medication histories, developing and updating pharmacy care plans, participating in formulary processes, and providing education to patients and other health care professionals.

Advanced Pharmacy Practice Experience – Patient Care Elective (P-3 summer or P-4): Advanced pharmacy practice experiences are primarily direct patient care experiences that build on the introductory experiences. Each experience is a full-time commitment of eight hours each day, five days a week, lasting six weeks. Students are required to complete seven, six-week experiences in their fourth year. Patient Care Elective Advanced Pharmacy Practice Experiences are designed to expand students' knowledge and further develop the practice skills needed in clinical specialty practice setting. Available specialties include (but are not limited to) geriatrics, infectious disease, oncology, pediatrics, psychiatry, and nutrition.

Advanced Pharmacy Practice Experience – Non-Patient Care Elective (P-3 summer or P-4): Advanced pharmacy practice experiences are primarily direct patient care experiences that build on the introductory experiences. Each experience is a full-time commitment of eight hours each day, five days a week, lasting six weeks. Students are required to complete seven, six-week experiences in their fourth year. Non-Patient Care Elective Advanced Pharmacy Practice Experiences are designed to expand students' knowledge and further develop the practice skills needed in a variety of non-patient care pharmacy practice settings. Available non-patient care electives include (but are not limited to) drug information, informatics, research, regulatory, manufacturing, marketing, sales, education, and professional organizations.

Advanced Pharmacy Practice Experience – Cardiac Hypertrophy Research (P-3 summer or P-4): This course is designed to give students exposure to a real laboratory research experience (as opposed to following a lab manual). Students complete a project that is based on the observation that the heart can adapt morphologically and functionally to various stresses. Physiologic stimuli, such as chronic exercise training, result in cardiac hypertrophy and this is considered a beneficial adaptation. The heart can also enlarge in response to pathologic stress such as hypertension or mutations in sarcomeric proteins increasing the risk of cardiac morbidity and mortality. Students use modern approaches to genomics, biochemistry, and molecular biology in an attempt to understand cardiac growth. The goal of these studies is to identify cellular targets that play a role primarily in either physiologic or pathologic hypertrophy.

Integrated Pharmacotherapy Sequence

Integrated Pharmacotherapy 1 (P-1 fall): This course is designed to introduce students to basic principles in the pharmaceutical sciences essential to understanding the scientific basis of drug therapy. Students learn about the physicochemical properties of drug molecules that influence the bioavailability, manufacture, and stability of pharmaceutical products. The impact of the pharmacokinetic processes of absorption, distribution, metabolism, and excretion on a drug molecule is also explored. This course describes the influence of a drug's chemical structure on its biological activity. The interactions of a drug molecule with a specific biological receptor and the resultant pharmacologic effect are discussed.

Integrated Pharmacotherapy 2 (P-1 fall): This course provides students with an integrated approach to understand principles of and solve problems related to fundamental cardiovascular and renal diseases in a team-based learning environment. The biochemistry, physiology, pathophysiology, medicinal chemistry, pharmacology, and pharmacotherapy related to the presentation and management of hypertension, ischemic heart disease, venous thromboembolism, peripheral arterial disease, hyperlipidemia, acute renal failure, glomerulonephritis, and drug-induced renal disease are addressed. Physicochemical and biological principles of dosage forms and drug delivery strategies used to treat these conditions are discussed, as are the materials and methods used to prepare and administer the appropriate treatment.

Integrated Pharmacotherapy 3 (P-1 spring): This course provides students with an integrated approach to understand principles of and solve problems related to fundamental respiratory disorders, allergic reactions, and infectious diseases in a team-based learning environment. The biochemistry, immunology, physiology,

pathophysiology, medicinal chemistry, pharmacology, and pharmacotherapy related to the presentation and management of respiratory disorders, allergic reactions, and infectious diseases are addressed. Physicochemical and biological principles of dosage forms and drug delivery strategies used to treat these conditions are discussed, as are the materials and methods used to prepare and administer the appropriate treatment.

Integrated Pharmacotherapy 4 (P-1 spring): This course provides students with an integrated approach to understand principles of and solve problems related to fundamental gastrointestinal, psychiatric, and dermatologic disorders in a team-based learning environment. The biochemistry, immunology, microbiology, physiology, pathophysiology, medicinal chemistry, pharmacology and pharmacotherapy related to the presentation and management of gastrointestinal, psychiatric, and dermatologic disorders are addressed. Physicochemical and biological principles of dosage forms and drug delivery strategies used to treat these conditions are discussed, as are the materials and methods used to prepare and administer the appropriate treatment. This course also explores the way in which biochemical changes in gene structure and gene expression lead to cancer.

Integrated Pharmacotherapy 5 (P-2 fall): This course provides students with an integrated approach to understand principles of and solve problems related to fundamental cardiovascular disorders, chronic renal disease, acute respiratory distress syndrome, shock, stroke, and electrolyte disorders in a team-based learning environment. The biochemistry, physiology, pathophysiology, medicinal chemistry, pharmacology, and pharmacotherapy related to the presentation and management of cardiovascular disorders, chronic renal disease, acute respiratory distress syndrome, shock, stroke, and electrolyte disorders are addressed. Physicochemical and biological principles of dosage forms and drug delivery strategies used to treat these conditions are discussed, as are the materials and methods used to prepare and administer the appropriate treatment.

Integrated Pharmacotherapy 6 (P-2 fall): This course provides students with an integrated approach to understand principles of and solve problems related to fundamental infectious diseases, immunologic disorders, and gynecologic disorders in a team-based learning environment. The biochemistry, immunology, microbiology, physiology, pathophysiology, medicinal chemistry, pharmacology and pharmacotherapy related to the presentation and management of infectious diseases, immunologic disorders and gynecologic disorders are addressed. Physicochemical and biological principles of dosage forms and drug delivery strategies used to treat these conditions are discussed, as are the materials and methods used to prepare and administer the appropriate treatment.

Integrated Pharmacotherapy 7 (P-2 spring): This course provides students with an integrated approach to understand principles of and solve problems related to fundamental hematologic disorders, oncologic disorders, and pain syndromes in a team-based learning environment. The biochemistry, genetics, physiology, pathophysiology, medicinal chemistry, pharmacology and pharmacotherapy related to the presentation and management of hematologic disorders, oncologic disorders, and pain syndromes are addressed. Physicochemical and biological principles of dosage forms and drug delivery strategies used to treat these conditions are discussed, as are the materials and methods used to prepare and administer the appropriate treatment.

Integrated Pharmacotherapy 8 (P-2 spring): This course provides students with an integrated approach to understand principles of and solve problems related to fundamental psychiatric, neurologic, and endocrinologic disorders in a team-based learning environment. The biochemistry, physiology, pathophysiology, medicinal chemistry, pharmacology and pharmacotherapy related to the presentation and management of psychiatric, neurologic, and endocrinologic disorders are addressed. Physicochemical and biological principles of dosage forms and drug delivery strategies used to treat these conditions are discussed, as are the materials and methods used to prepare and administer the appropriate treatment.

Integrated Pharmacotherapy 9 - 12 (P-3 fall and spring): These courses provide students with an integrated approach to understand principles of and solve problems related to concomitant diseases through complicated

patient cases. The biochemistry, physiology, pathophysiology, medicinal chemistry, pharmacology and pharmacotherapy related to management of coexisting diseases are addressed. Material covered in previous Integrated Pharmacotherapy sections are reviewed as needed to address the problems related to each patient case. In addition, new material is incorporated into each patient case. Physicochemical and biological principles of dosage forms and drug delivery strategies used to treat these conditions are discussed, as are the materials and methods used to prepare and administer the appropriate treatment.

Pharmacy Skills Sequence

Integrated Pharmacy Laboratory 1 (P-1 fall): The integrated laboratory course is designed to develop patient assessment, communication, pharmaceutical calculations, prescription preparation and dispensing, and extemporaneous compounding skills. The laboratory subject matter is designed to coordinate with relevant topics that are presented in the integrated therapeutics sequence. In the first integrated laboratory course, students are introduced to pharmaceutical measurements and perform the calculations necessary to prepare dosage forms relevant to the treatment of disease states covered in the therapeutics course. Students acquire the fundamental clinical skills needed to perform physical exams, write SOAP notes, and interpret diagnostic tests (including general serum and urine chemistries). These foundational skills are applied to cardiovascular and renal disease states to complement the disease states covered in the integrated pharmacotherapy course.

Integrated Pharmacy Laboratory 2 (P-1 spring): Students build on skills introduced in IL-1 and acquire new patient assessment, communication, pharmaceutical calculations, prescription preparation and dispensing, and extemporaneous compounding skills. Patient assessment is expanded to include pulmonary, EENT, abdominal, integument, and mental status examinations. Patient counseling related to inhaler use and smoking cessation is emphasized. Advanced topics in prescription preparation and dispensing, including legal requirements for dispensing, are included. The repertoire of dosage form calculations and preparation is expanded to include troches, suppositories, topicals, and enteral/parenteral nutrition. The course also provides an introduction to topics in drug information.

Integrated Pharmacy Laboratory 3 (P-2 fall): Students build on skills introduced in IL-2 and acquire new patient assessment, communication, pharmaceutical calculations, prescription preparation and dispensing, and extemporaneous compounding skills. Patient assessment skills related to cardiovascular, renal, and infectious diseases are reinforced and expanded. Student case presentation skills are emphasized. Students perform electrolyte and buffer calculations and prepare parenteral dosage forms. Clinical and cultural issues in the treatment and counseling of women regarding health and reproductive issues are addressed.

Integrated Pharmacy Laboratory 4 (P-2 spring): Students build on skills introduced in IL 1-3 and acquire new patient assessment, communication, pharmaceutical calculations, prescription preparation and dispensing, and extemporaneous compounding skills. Topics are designed to complement the integrated pharmacotherapy course. Neurological examination techniques are introduced and mental status assessment is reinforced and expanded. Students apply the results of coagulation testing to the management of hematological disorders. Corrected lab values are used to inform patient management strategies. The preparation of emulsions is covered in the compounding section of the course, and student skills related to IV infusions, parenteral admixtures, and rate-flow calculations with a focus on cancer chemotherapy are developed. Prescription error reporting and risk management strategies are emphasized.

Integrated Pharmacy Laboratory 5 (P-3 fall): The material presented in the integrated laboratory course for the third professional year is intended to serve as a review of skills developed during professional years 1 and 2 and is extended to help students learn to manage complicated patients. Students develop specific patient assessment skills to better serve pediatric and geriatric populations. Active listening and patient communication skills that promote

compliance and continuity of care are emphasized. A main focus of this course is on effectively accessing drug information for the purpose of finding the most effective therapies and preventing drug interactions. In the compounding lab, students learn to amend manufactured pharmaceutical products to more effectively address the needs of special populations. Counseling skills are broadened to include considerations for recommending durable medical goods and instructing patients on their proper use.

Integrated Pharmacy Laboratory 6 (P-3 spring): The material presented in the integrated laboratory course for the third professional year is intended to serve as a review of skills developed during professional years 1 and 2 and is extended to help students learn to manage complicated patients. Students develop specific patient assessment skills to better serve pediatric and geriatric populations. Active listening and patient communication skills that promote compliance and continuity of care are emphasized. A main focus of this course is on effectively accessing drug information for the purpose of finding the most effective therapies and preventing drug interactions. In the compounding lab, students learn to amend manufactured pharmaceutical products to more effectively address the needs of special populations. Counseling skills are broadened to include considerations for recommending durable medical goods and instructing patients on their proper use.

Drug Information and Biomedical Literature Evaluation (P-2 fall): Students study the types of drug information available in print and electronic formats and identify which sources are appropriate to use in a variety of situations. The advantages and disadvantages of primary, secondary, and tertiary literature are discussed. Students learn how to respond systematically to drug information requests. Emphasis is placed on how to efficiently find and evaluate biomedical literature and apply it to patient care.

Inquiry and Research in Pharmacy Practice (P-2 fall): This course examines research paradigms, assumptions, designs, methods, and ethical considerations as applied to pharmacy services research. Content includes a review of measurement evaluation, statistical methods and tools, the critique of published findings, and data evaluation, analysis, and presentation.

Public Health Sequence

Pharmacy Law and Policy (P-1 fall): Students learn about the history of pharmacy laws and how these laws have structured current practice guidelines and impact the distribution and dispensing of drugs. Students also learn about state and local statutes concerning pharmacy practice and healthcare policies relevant to the practice of pharmacy. Civil liability in pharmacy practice and professional ethics is discussed.

Therapeutic Principles of Self-Care (P-1 fall): Students study the selection and rational use of nonprescription medications used by patients for self treatment or care of others without the direct supervision of a physician. The use of appliances, durable medical goods, and over-the-counter testing devices is also emphasized. Interviewing and decision-making skills for patient triage as well as consultation skills are emphasized.

Health Care Ethics and Advocacy for Pharmacists (P-1 spring): This course examines ethical and moral reasoning processes in health care, with emphasis on the practice of pharmacy. It explores philosophical and faith-based foundations, including Catholic moral tradition, socio-cultural influences, professional codes, and organizational and personal ethical norms. Ethical issues are examined with emphasis on leadership. Students analyze ethical dilemmas and evaluate ethical practice using ethical theory, moral argument, and case studies.

Faith Traditions in Health Care (P-3 spring): Students survey different religious belief structures and explore how people in these faith traditions access and use health care resources. Emphasis is placed on understanding and communicating with patients who present with beliefs that are less commonly encountered than those of patients who pharmacists routinely counsel.

Pharmacy Systems Sequence

Healthcare Systems (P-1 spring): The course examines the ways in which health care is accessed and used in the United States and contrasts this system with others around the world. The roles of regulatory agencies, advocacy organizations, and the pharmaceutical industry are discussed. Issues of public health policy, economic behavior, and outcomes are also covered.

Pharmacoeconomics (P-2 spring): The course discusses ways to collect, analyze, and interpret the costs of drug therapies and alternatives in health care systems. Students learn how to determine the economic impact of clinical outcomes, and how to identify, track and assign costs to different types of health care resources that are used. Pharmacoeconomic models, including cost minimization, cost of illness, cost effectiveness, cost benefit, and cost utility analysis and techniques will be discussed.

Pharmacy Leadership & Management (P-3 fall): This course provides an overview of fundamental principles of leadership. Attributes of effective leaders are identified and discussed. An emphasis is placed on identifying and cultivating personal leadership qualities that can be utilized throughout one's pharmacy education and career.

Course Elective Sequence

Advanced Topics in Integrative Medicine (P-3 spring): This course is designed to develop a broad knowledge-base in the field of Integrative Medicine. Integrative Medicine refers to a method of combining conventional medicine with non-conventional therapies such as acupuncture, massage therapy, botanicals and vitamins. This lecture, lab and TBL course covers nutritional supplements, herbs, vitamins, minerals, and various culturally based health systems. Students are required to make an exploratory visit to a health food store, answer two clinical questions and provide direct patient care at the Center for Integrative Medicine.

Drug Interactions (Year and term to be decided): This course is designed to provide students with an in-depth understanding of the mechanisms by which pharmacodynamic and pharmacokinetic drug interactions occur and the skills necessary to apply drug interaction knowledge to patient care. Students are introduced to basic methods of foundational drug interaction research. They also learn how to assess drug interaction literature to make informed decisions about patient care and further develop skills in screening drug regimens for clinically relevant drug interactions.

Drugs of Abuse (Year and term to be decided): This course covers the pharmacological, clinical, and societal aspects of psychoactive/psychotropic drugs of abuse. Special emphasis is placed on observable signs and symptoms, screening, and therapeutic management of commonly abused drugs. Students review basic and applied research advances in prevention and treatment of substance abuse.

Advanced Pharmacokinetics (Year and term to be decided): Students build upon knowledge and skills acquired in basic pharmacokinetic principles. The construction of theoretical pharmacokinetic models using concentration versus time data is emphasized. Students engage in pharmacokinetic study design as a means to investigate changes in drug disposition due to aging, disease, or other altered physiological state.

Advanced Topics in Drug Delivery (Year and term to be decided): Biological and physical-chemical properties of drug molecules that inspire the development of drug delivery technologies are studied in depth. The history of exemplar products that are currently on the market is examined, illustrating the technical and regulatory obstacles that limited the rate of technology development and product approval. This perspective is applied to recent drug delivery strategies, including nanoscale technologies. The economic impact of developing a product that incorporates advanced drug delivery technologies is examined. The course also emphasizes consideration of ethical issues that surround pharmaceutical technologies.

Pharmacogenomics and Biotechnology Pharmaceuticals (P-3 fall): The efficacy and pharmacokinetics of some drugs is highly variable across large populations. This course discusses the effects of genetic variability on drug toxicity and efficacy, the characterization of polymorphisms relevant to drug action, and the identification of novel genomic targets for drug development. The legal, ethical, and social implications, as well as the role of pharmacists in pharmacogenomics are addressed. The role of pharmaceutical biotechnology in the production of biopharmaceutical agents is also be introduced.

Palliative Care (Year and term to be decided): This course introduces students to the interdisciplinary nature and principles of palliative care, emphasizing the role of the pharmacist. It also enhances the student's ability to determine appropriate pharmacological management for pain and symptom control in the dying patient.