

PHARMACY (PHAR)

PHAR 105. Introduction to Pharmacy. (1 Credit)

Intro to pharmacy is an online introductory course intended for undergraduate students who are interested in the profession of pharmacy, regardless of previous experience in the profession. This course is designed to help students understand the progressive world of pharmacy and the profound impact pharmacists have on patient care. Whether you are considering pharmacy as a potential career path or are just interested in the subject, this course will open your eyes to the exciting profession of pharmacy. This course will introduce the student to the history of pharmacy, the pharmacist's and technician's role in patient care, drug discovery, pharmacy law, and many other important pharmacy topics.

PHAR 310. Pharmacy Biochemistry. (3 Credits)

Pharmacy Biochemistry is a one-semester course covering how atoms and molecules interact to produce life processes. Topics include, but are not limited to, biological synthesis of macromolecules, the chemistry of biological molecules, protein structure and function, enzyme mechanisms and kinetics, carbohydrate and lipid metabolic processes, nucleic acid chemistry and protein synthesis, cell communication, and biochemical regulation. Pharmacy Biochemistry is limited to CUW School of Pharmacy students.

PHAR 312. Pharmacy Anatomy and Physiology. (5 Credits)

This course will be divided into separate units, each consisting of an in-depth description and analysis of the human body. Anatomic structures will be presented from the molecular level (molecular biology) and the microscopic level (histology) to the gross anatomic level. Diagrams, illustrations, and photographs showing the anatomic relationships will be complemented with radiographic modalities including X-ray, CT, MRI, and Ultrasound images. When pertinent, photographs and video of surgical specimens and procedures will be presented. Each student must participate in one small-group interactive session in the CUW Human Cadaver lab later in the semester. Understanding the physiologic regulation of each organ system and the interaction between organ systems will be an expectation for the students. Demonstration of physiologic responses will be complemented via special in-class exercises including basic physical examination skills and other diagnostics modalities such as ECG, Echocardiogram, Pulmonary Function Testing, and basic hematologic and blood chemistry analysis. Students will not participate in any invasive procedure or examination skill such as phlebotomy, but will be expected to understand those invasive procedures which were demonstrated on medical videos during class time. Included in the topics will be an introduction to Pregnancy and Fetal Development.

PHAR 314. Pharmacy Microbiology. (4 Credits)

This course introduces the pharmacy student to the fundamentals of microbiology and immunology, especially as it relates to clinical applications. Organisms of interest include bacteria, viruses, fungi, and parasites, as well as the immunological responses of the host, and the molecular mechanisms of transfer of genetic information and drug resistance within pathogenic microbes. The primary goal is to assist each student to (i) acquire and integrate the knowledge necessary to make scientifically based judgments concerning immune and microbial diseases, and (ii) apply new findings gained by personal observation or by informed reading of the current literature.

Prerequisites: PHAR 310 and 312.

PHAR 316. Cell and Molecular Fundamentals. (1 Credit)

Cell and Molecular Fundamentals for Pharmacology students is a 1 credit, one-semester study of essential cell and molecular mechanisms underlying processes essential to life and instrumental in understanding disease and drug mechanisms. Topics will include, but are not limited to the cellular basis of living organisms, internal cell structure and cytoskeleton, endomembrane sorting and transport, protein contributions to cell and organelle function, cell communication mechanisms, cell cycle and apoptosis, structural organization of genomes, control of gene expression, and differentiation mechanisms facilitating tissue form and function. The course is designed specifically to complement PHAR 310 Pharmacy Biochemistry and to support CUW School of Pharmacy (SOP) student progression into pharmacology.

PHAR 320. Pharmaceutics I. (2 Credits)

This course covers the theory of physicochemical and kinetics principles applicable to pharmaceutical systems, states of matter, with emphasis on aqueous solution chemistry, including solubility, acid-base systems, buffer systems, partition coefficient/distribution, along with diffusion, drug release, dissolution processes, and pharmaceutical kinetics/stability.

PHAR 322. Pharmaceutics II. (4 Credits)

Building upon the content of Pharmaceutics I, this course expands the knowledge base within the domain of drug delivery. Pharmaceutical dosage forms are introduced, along with their rationale for delivering optimal therapeutic benefit. A survey of the various sites available for drug administration, anatomic, physiologic and pathophysiologic considerations of those sites, and drug product requirements are covered. Oral, pulmonary, ocular, otic, buccal, sublingual, inserted, dermal, specialty, innovative dosage forms and device/drug product combinations, ETC., are included. Students taking this course will develop competency in the principles upon which dosage forms act on or within the human body, thus fulfilling the University's core curriculum goal of scientific literacy. (Includes patient care skills teaching laboratory.) Prerequisite: PHAR 320.

PHAR 330. Pharmacology and Medicinal Chemistry I. (3 Credits)

This course introduces the pharmacy student to the fundamentals of pharmacology, toxicology, and medicinal chemistry. Included are more comprehensive overviews of Autonomic and Central nervous system pharmacology. The theme of xenobiotics is used to keep an initial focus on the broad spectrum of pharmacologic and toxicologic properties of external compounds (drugs and toxins) that affect the nervous system. This first course of three Pharmacology / Medicinal Chemistry courses will emphasize target organ effects, dose/response, and the molecular basis of drug action so that students can fully understand basic pharmacologic principles of drug and xenobiotic handling. Neuropharmacology and analgesic drugs that act on the Central nervous System are the organ system of focus. Neurotoxicology-related topics that are discussed in this course include substance abuse and treatment, poison control support of emergency medicine, and public health / preventive medicine frameworks. Topics in medicinal chemistry provide the basis for understanding how drug structure affects function, and how pharmaceutical products are designed and developed. Prerequisites: PHAR 310, 312 and 320.

PHAR 340. Pharmacy and the Health Care System. (3 Credits)

This course will cover the major concepts related to the structure and functioning of the U.S. health care system. Emphasis will be placed on analyzing issues associated with health care systems and personnel and the way health care is organized, financed, and regulated. The course will also examine the provision of drugs and pharmacy services in the context of the health care enterprise.

PHAR 350. Pharmacotherapy I: Self Care. (2 Credits)

Pharmacotherapy I: Self-Care is the first of five courses in which you will learn about pharmacotherapy, which is the treatment of disease through the use of drugs. This course will discuss the pathophysiology, epidemiology, and treatment of common, self-limiting conditions.

PHAR 352. Pharmacy Calculations. (1 Credit)

Accurately performing pharmaceutical calculations is a critical component in providing patient care in every pharmacy practice environment. Consequently, pharmaceutical calculations are a vital part of any pharmacy curriculum. Although most pharmaceutical calculations are not 'rocket science', it is a topic that deserves attention because it requires virtually flawless accuracy. Before students are able to become optimally proficient at performing pharmaceutical calculations, they must understand approaches to pharmaceutical calculations that help minimize error and maximize accuracy. Their pre#course perceptions of pharmaceutical calculations must also be openly addressed so that these perceptions do not hinder the students' focus on pharmaceutical calculations.

PHAR 370. Applied Patient Care I. (2 Credits)

APC I is the first of six integrated patient care skill development courses in the School of Pharmacy curriculum. It is a patient#centered course that uses simulated patient scenarios and case studies to build students' foundational skills in drug information retrieval, patient interviewing, patient education, communication with patients and health care professionals, and critical thinking in the context of pharmacy's multiple disciplines. This course series integrates knowledge from multiple disciplines in the curriculum and provides a chance for students to apply this knowledge while developing their patient care skills and professional attitudes for utilization during subsequent coursework in Applied Patient Care, experiential education (IPPEs) and pharmacy practice.

PHAR 372. Applied Patient Care II. (2 Credits)

APC II is the second of six integrated patient care skill development courses in the School of Pharmacy curriculum. The series aims to teach students critical thinking and to provide patient-centered care by utilizing the Pharmacists' Patient Care Process (PPCP), and this course is focused on the specific direct patient care skills of gathering a medication list (collect), and providing patient education (implement), with an introduction to assessment, plan, and documentation as related to pharmaceutical assessment, care plan delivery, and EHRGO documentation, and ISBAR notes. This course series integrates knowledge from multiple disciplines in the curriculum and provides a chance for students to apply this knowledge while developing their communication skills, including health literacy, cultural competency, prescription drug processing and drug information foundations, as well as their professional attitudes for utilization during subsequent coursework in Applied Patient Care, experiential education (IPPEs) and pharmacy practice. This accomplished through case studies and patient care simulations that focus on basic science, pharmaceutical science, clinical science, and patient care concepts in one course.
Prerequisite: PHAR 370.

PHAR 380. Introductory Pharmacy Practice Experience I. (3 Credits)

During the first semester of Introductory Pharmacy Practice Experience (IPPE#1), students are exposed to the roles and responsibilities of the professionally oriented pharmacist and the importance of effective communication between pharmacists, patients, and other healthcare providers. An emphasis will also be placed on beginning to understand the role that cultural differences play in health care. Experiential rotations at off campus pharmacies will include a minimum of 40 hours each in a community and hospital setting. Legal, ethical, and practice issues in pharmacy are discussed during classroom and experiential activities.

PHAR 382. Introductory Pharmacy Practice Experience II. (3 Credits)

During the second semester of Introductory Pharmacy Practice Experience (IPPE#2), students continue to explore the roles and responsibilities of the professionally oriented pharmacist and the importance of effective communication between pharmacists, patients, and other healthcare providers. Off campus experiences will include a minimum of 40 hours each in a community and hospital setting where students apply skills and knowledge from the didactic curriculum. Course content focuses on communication, professional development, medication safety, and working in healthcare teams.
Prerequisite: PHAR 380.

PHAR 424. Applied Pharmacokinetics/Therapeutic Drug Monitoring. (3 Credits)

This course expands on the previous teaching regarding absorption, distribution, metabolism, and elimination/excretion (ADME/ADE). Students will need to draw on their previous coursework to understand fundamental concepts in ADME/ADE and readily apply this knowledge. Further examination of pharmacokinetic (PK) models will assist students' conceptual understanding of ADME/ADE. Using this conceptual framework, students will simultaneously develop and hone skills in PK dosing and therapeutic drug monitoring. Students should be prepared to not only acquire new knowledge but also readily apply their new and existing PK knowledge to optimize doses and solve complex PK dosing problems. To accomplish these tasks the course will move rapidly and students must contact instructors immediately with problems in keeping pace.
Prerequisites: PHAR 322, 330 and 352.

PHAR 426. Advanced Pharmaceutical Preparations. (2 Credits)

This course is a continuation of the non-sterile and sterile product preparation skill development from the Pharmaceutics II course and laboratory. Topics emphasized will include aseptic technique, incompatibilities, cytotoxic preparations, parenteral nutrition and continued proficiency in common sterile preparations.
Prerequisite: PHAR 322.

PHAR 432. Pharmacology & Medicinal Chemistry II. (4 Credits)

This course continues to expand the pharmacy student's knowledge of the fundamentals of pharmacology and toxicology, re-emphasizing critical objectives with regard to drug Mechanism of Action, Absorption, Distribution, Metabolism, and Elimination. Extensive review of drug structure, receptor binding, and Medicinal Chemistry will be a focal point for the course plus new drug discovery and development. The Medicinal Chemistry sections of this course will emphasize drug structure as a determinant of receptor binding, receptor activation, and receptor antagonism. The logic of drug design will be presented, with a focus on how variations to chemical structure can lead to changes in drug efficacy, as well as altered toxicity and bioavailability.
Prerequisite: PHAR 330.

PHAR 434. Pharmacology & Medicinal Chemistry III. (4 Credits)

This course continues to expand the pharmacy student's knowledge of the fundamentals of pharmacology and toxicology, re#emphasizing critical objectives with regard to drug Mechanism of Action, Absorption, Distribution, Metabolism, and Elimination. Extensive review of drug structure, receptor binding, and Medicinal Chemistry will be a focal point for the course. The Medicinal Chemistry sections of this course will emphasize drug structure as a determinant of receptor binding, receptor activation, and receptor antagonism. The students will have to be able to draw basic structures. The students will also continue their drug#drug interaction project from the previous semester.
Prerequisite: PHAR 432.

PHAR 442. Social and Behavioral Pharmacy. (2 Credits)

This course is a survey of topics in the social and behavioral sciences as applied to pharmacy. The goal of the course is to give students a better understanding of how social, psychological, and socio-cultural factors explain and relate to disease processes, patients and pharmacist's orientation to the health care system, and patient-pharmacist encounters. Topics covered include (but are not limited to) the relationship between the mind and the body, the nature and experience of chronic illness, mental illness, substance use, patient counseling and communication, pharmacist-physician interaction, medication adherence, and medication errors.

PHAR 450. Pharmacotherapy II. (3 Credits)

This required course is the second of five courses in pharmacotherapy. Pharmacotherapy II is designed to teach students the epidemiology, etiology, pathophysiology, clinical presentation, treatment options and evaluation of therapeutic outcomes of many renal, fluid and electrolyte, acid-base, and cardiovascular disorders. The course aims to develop pharmacists with the clinical knowledge, skills, and judgment to make clinical decisions based on sound therapeutic principles of drug and disease state management, treatment guidelines, and relevant individual patient factors. Ultimately the goal of this course is to empower students to be able to provide evidence-based, safe, and appropriate medication use for patients with renal, fluid and electrolyte, acid-base, and cardiovascular disorders.

Prerequisites: PHAR 330 and 350.

PHAR 452. Pharmacotherapy III. (4 Credits)

Pharmacotherapy III is the third of five courses in which students will learn about the treatment of diseases through the use of medications. The course focuses on the core content areas of infectious diseases, endocrine disorders, and inflammatory disorders. Students will develop the skills needed to make evidence-based, patient-specific medication use recommendations relative to the core content areas.

PHAR 460. Medical Literature Evaluation I. (2 Credits)

Medical Literature Evaluation I is the first in a 2-course series focusing on the use of medical literature for patient care. This course will focus on the critical evaluation of primary literature, including principles of biomedical statistics, research design, literature evaluation, and application to patient care.

PHAR 462. Medical Literature Evaluation II. (2 Credits)

Medical Literature Evaluation II is the second in a 2-course series focusing on the use of medical literature for patient care. This course will build upon primary literature evaluation skills gained in Medication Literature Evaluation I and further develop the critical evaluation of primary literature, including principles of biomedical statistics, research design, literature evaluation, and application to patient care.

Prerequisite: PHAR 460.

PHAR 470. Applied Patient Care III. (2 Credits)

Applied Patient Care III is the third of six integrated patient care skill development courses in the School of Pharmacy curriculum. It is a patient-centered course that uses simulated patient scenarios and case studies to build students' foundational skills in drug information retrieval, patient interviewing, patient education, and critical thinking in the context of pharmacy's multiple disciplines. The first two courses in this series focused on the specific direct patient care skills of gathering a medication list, providing patient education, conducting a comprehensive interview of a new patient, and providing a verbal care plan to a patient with much of the therapeutic content coming from self-care topics. Applied Patient Care III continues to build on these skills while introducing the direct patient care skills of patient follow-up, clinical documentation, and patient-appropriate documentation, as well as introducing working with simulated interprofessional charts and multiple providers. It will also continue to develop students' skills in drug information and health literacy while integrating with the didactic curriculum and the IPPE series.

Prerequisite: PHAR 372.

PHAR 472. Applied Patient Care IV. (2 Credits)

This course is the fourth of six integrated patient care skill development courses in the School of Pharmacy curriculum. It is a patient-centered course that uses simulated patient scenarios and case studies to build students' foundational skills in drug information retrieval, patient interviewing, patient education, and critical thinking in the context of pharmacy's multiple disciplines. Students will learn new skills in provider communication and will have an opportunity to further develop documentation skills. The course will also continue to develop students' skills in drug information and health literacy while integrating with the didactic curriculum and the IPPE series.

Prerequisite: PHAR 470.

PHAR 474. Servant Leadership and Public Health. (2 Credits)

The servant leadership philosophy/perspective focuses the leader on the needs of others for their benefit and connects nicely with the ethos of our profession and the mission of Concordia University Wisconsin. Though servant leadership outcomes are covered longitudinally through our curriculum, this course will provide a central point of focus for introducing, advancing and evaluating concepts related to the servant leadership and related outcomes. The course will focus on leadership development, public health, and their relation to meeting the needs of others and advancing the profession of pharmacy. This class will consist of three distinct, yet interrelated units: Serving the Profession through Leadership and Advocacy, Serving Patients and Community through Public Health, and Public Health – Immunizations.

PHAR 480. Introductory Pharmacy Practice Experience III. (2 Credits)

During the third semester of Introductory Pharmacy Practice Experience (IPPE#3), students continue to explore and experience the roles and responsibilities of the professionally oriented pharmacist and the importance of effective communication between pharmacists, patients, and other healthcare providers. Off campus experiences will include 40 hours each in a community and hospital setting. Legal, ethical and practice issues in pharmacy are discussed during classroom and experiential activities.

Prerequisite: PHAR 382.

PHAR 482. Introductory Pharmacy Practice Experience IV. (2 Credits)

During the fourth semester of Introductory Pharmacy Practice Experience (IPPE-4), students continue to explore and experience the roles and responsibilities of the professionally oriented pharmacist and the importance of effective communication between pharmacists, patients, and other healthcare providers. Off campus experiences will include 40 hours each in a community and hospital setting. Legal, ethical and practice issues in pharmacy are discussed during classroom and experiential activities.

Prerequisite: PHAR 382.