



جامعة عجمان  
AJMAN UNIVERSITY

## **Doctor of Pharmacy (PharmD) Course Description**

**September 2026**

## Department of Clinical Sciences

### A. Department Obligatory Courses

#### **PHA101 Communication Skills for Interprofessional Practice**

This course introduces students to the principles of professional identity, professionalism and interprofessional collaboration in modern healthcare systems. Students will explore various pharmacy career paths including community, hospital, industry, research, and academia while developing a foundational understanding of professional behavior, ethical standards, and team-based practice. Students will learn the use of common medical and pharmaceutical terminology, prescription-related legal requirements, and core competencies of effective communication, including verbal, nonverbal, and written during professional and interprofessional interactions.

PR: NA

#### **PHA130 Principles of Human Anatomy and Physiology I**

The course provides basic knowledge of normal human body structure and function necessary for students of College of Pharmacy to be capable of understanding other related pathological and clinical medical courses. It also assists students to properly understand the pharmacology of drugs and its application in clinical pharmacy.

PR: NA

#### **PHA131 Principles of Human Anatomy & Physiology II**

The course provides basic knowledge of normal human body structure and function necessary for students of Faculty of Pharmacy and Medical Sciences to be capable of understanding other related pathological and clinical medical courses. It also assists students to properly understand the pharmacology of drugs and its application in clinical pharmacy.

PR: PHA130

#### **PHA117 Biochemistry**

This course deals with the general aspects of Chemistry of carbohydrates, amino acids polypeptides and proteins, nucleic acids, lipids, vitamins and enzymes. This includes: the structure of these compounds, their classification and biomedical importance. The course relates structure of the compounds to their function.

PR: PHA110

#### **PHA150 Introductory Pharmacy Practice Experiences I**

This course is observatory in nature and will familiarize the students to both hospital and community pharmacy practice settings. The training is designed to provide students with the preparation needed to understand the practice environments they will enter and to expose them to areas of pharmacy practice. Similarly, this training course provides an opportunity for the students to familiarize them on role of pharmacist in community pharmacy and necessary information on functioning of a Community Pharmacy, its organization, management etc. Students also gain understanding on the law and ethical standards practiced in hospital and community pharmacy settings.

PR: PHA101

**PHA264 Pharmaceutical Microbiology and Immunology I**

Microbiology and Immunology: I designed to introduce the students to microbe's world exemplified by Prokaryotes, Eukaryotes and the unique properties of the viruses. Trying to give a brief and up-date presentation of those aspects of medical organisms that can inflict damages to human health. Explore sterilization techniques. Antibiotics discussed at length. Immunology as rapidly developing field plays a pivoted role in health and disease so it deserves a fair share in this course.

PR: PHA117

**PHA230 Pharmacology I**

This course provides students with basic pharmacological concepts and knowledge about autonomic nervous system, respiratory system and autacoids. The course aims to improve students' ability to understand the pharmacodynamics and pharmacokinetic properties of drugs and identify how to assess the relevant factors for the management of patients with various autonomic and respiratory systems related conditions. This course also aims to improve students' ability to provide professional reports and assignments.

PR: PHA117, PHA131

**PHA217 Clinical Biochemistry**

This course is designated to provide a comprehensive survey of the clinical aspects of diseases and their effect on body chemistry. Topics include Lipid metabolism and lipoproteins disorders, renal function tests, liver function tests, cardiac function tests, metabolic aspects of tumors, and main hematological disorders.

PR: PHA117

**PHA231 Pharmacology II**

This course provides students with in-depth pharmacological knowledge on cardiovascular, renal, blood and gastrointestinal medications. The course aims to improve students' ability to understand the pharmacological actions and the therapeutic uses of drugs acting on the cardiovascular system, the renal system, the gastrointestinal tract and the hematopoietic system, their mechanism of actions, adverse effects, indications and contraindications. This course also aims to improve students' self and team learning skills in providing professional decision making.

PR: PHA230

**PHA265 Pharmaceutical Microbiology and Immunology II**

The course microbiology and immunology II discusses in more detail Gram-positive and negative bacteria, mycobacteria, spirochetes, chlamydia and rickettsia, viruses of medical importance and unconventional infectious agents. Pathogenicity, signs and symptoms and diagnosis and treatment for the mentioned pathogens is covered.

PR: PHA264

**PHA220 Introductory Pharmacy Practice Experiences II**

During this training the student will learn different concepts in the hospital pharmacy. The student will also develop professionalism attitudes, judgment and skills needed to work in a hospital. In addition, the student will be able to record drug distribution and perform inventory control

processes. Whenever applicable, the student participates various operations carried out in the hospital pharmacy and communicate with other healthcare professionals.

PR: PHA150

### **PHA333 Pharmacology III**

This course provides students with in-depth Pharmacological and Therapeutic knowledge on Central Nervous System and endocrine medications. The course aims to improve students' ability to understand the pharmacological actions and the therapeutic uses of drugs acting on the central nervous system and endocrine system, their mechanism of actions, adverse effects, indications and contraindications. This course also aims to improve students' self and team learning skills in providing professional decision making.

PR: PHA231

### **PHA374 Therapeutics I**

This course provides students with in-depth therapeutic knowledge on cardiovascular and respiratory, gastrointestinal disorders (GIT). The course aims to improve students' ability to identify and critically assess the relevant factors for the management of patients with cardiovascular, respiratory, and GIT diseases. Further, it is designed to help students integrate drug therapy into an overall cardiovascular/respiratory or GIT disease management plan.

PR: PHA231

### **PHA377 Drug Information & Literature Evaluation**

"Drug Information and Literature Evaluation" is a course designed to introduce students to the fundamentals of drug information, types of literature with evaluation for each, types of study designs, and evaluation of clinical trials by equipping students with the principles to critique literature and judge their practical implications. A common drug information resource such as UpToDate® Lexidrug™ will be used to allow students to use the technology of drug information, and retrieval for different drug requests and for quality assurance. The course also describes referencing styles for writing scientific reports.

PR: PHA306, PHA374

### **PHA379 Therapeutics II**

This course provides students with in-depth knowledge of Endocrine, Renal, and Urological disorders. Therapeutic management of these conditions and pharmacist role is emphasized. The course also covers topics related to drug use in pregnancy and lactation and the factors used in decisions about medication use in these conditions.

PR: PHA374

### **PHA380 Introductory Pharmacy Practice Experiences III**

This course will provide the students with general understanding of basic pharmacogenomics principles and concepts as well as the understanding of genotype/phenotype relationships and gene-environment interactions as determinants of disease susceptibility. It will examine the molecular basis for differences in drug disposition and application of that information for individualized drug treatment regimens and disease prevention strategies. Finally, it will explore ethical, legal, social, and economic issues relevant to pharmacogenomics testing.

PR: PHA220

### **PHA370 OTC Drugs & Products**

This OTC course is designed to establish a strong knowledge of non-prescription drugs in all its aspects and making pharmacist's job to be patient oriented and not product oriented. This will include monitoring, screening, and evaluating drug treatment regimens in community settings. In particular, symptoms associated with: gastro-intestinal tract, respiratory, skin, central nerves system, pediatrics, women's health, men's health, eyes and ears, holiday healthcare will be considered with respect to: possible causes; symptoms and signs; treatment available; counseling points; and when to refer to doctors. It also covers herbal, nutritional supplements available in the community pharmacy.

PR: PHA374

### **PHA476 Therapeutics III**

This course provides students with in-depth therapeutic knowledge on neurological, psychiatric, bone, and hematological disorders. The course aims to improve students' ability to identify and critically assess the relevant factors for the management of patients with neurological, psychiatric, bone, and hematological disorders. Further, it is designed to help students integrate drug therapy into an overall neurological, psychiatric, bone, and hematological disorders management plan.

PR: PHA379

### **PHA485 Pharmacovigilance and Epidemiology**

This course is an introduction to understanding the basic concepts of Pharmacoeconomics through the use of various analysis techniques to compare the costs and consequences of pharmaceutical products and services to patients, healthcare systems and society. The course deliberates on Pharmacoeconomics application in informing health decisions and resource allocation.

PR: PHA377

### **PHA442 Principles and Practice of Toxicology**

This course is designed to give the student basic concepts of toxicology as they apply to the effects of environmental agents, e.g. chemicals, metals, on human health. The course discusses the distribution, cellular penetration, metabolic conversion, and elimination of toxic agents, as well as the fundamental laws governing the interaction of foreign chemicals with biological systems to cause adverse effects. The lecture course provides students with a conceptual framework for understanding the broad spectrum of Clinical toxicology of drugs and essential chemicals, (toxic dose, diagnosis and treatment with focus on antidotes and, the basic principles and mechanisms of toxicology as applied to various chemicals or classes of chemicals in selected tissues and organs.

PR: PHA333

### **PHA470 Regulatory Affairs in Pharmacy**

This course provides students with an overview of quality management systems in various pharmacy practice settings. Regulatory requirements during manufacturing and control of pharmaceuticals including numerous good practices will be covered. Drug approval process and registration in local, regional, and key Arab and international world pharmaceutical markets will be discussed. The course also focuses on the detection and regulatory aspects of counterfeit pharmaceutical products. Ethical principles and codes that govern the pharmacy profession in different pharmacy practice settings are discussed.

PR: PHA226, PHA301

### **PHA415 Pharmacy Management and Marketing**

The first part of the course covers the concepts of pharmaceutical business management in pharmacy practice, which includes human resource management, budgeting, inventory management, financial statements, and managing risks in pharmacy practice settings. The second part of this course is designed to provide students with a comprehensive understanding of the principles and aspects of pharmaceutical marketing to explore the major components of the marketing mix, including product, place, promotion and pricing, and their role in pharmaceutical industry. This prepares future pharmacy practitioners with the fundamentals of analytical and decision-making skills to create basic marketing strategies.

PR: PHA470

### **PHA434 Chemotherapy**

This course provides students with in-depth knowledge on the understanding of how antimicrobial and chemotherapeutic agents work. Principles of antimicrobial and chemotherapeutic therapy are covered. Pharmacist management of common infections encountered in the community will be discussed.

PR: PHA333

### **PHA417 Principles of Pharmaceutical Care**

The purpose of this course is to introduce the philosophy and practice of Pharmaceutical Care and pharmacist-provided patient-centered care. It also provides students with basics of patient assessment processes and documentation.

PR: PHA476

### **PHA466 Pharmacoeconomics**

This course is an introduction to understanding the basic concepts of Pharmacoeconomics through the use of various analysis techniques to compare the costs and consequences of pharmaceutical products and services to patients, healthcare systems and society. The course deliberates on Pharmacoeconomics application in informing health decisions and resource allocation.

PR: PHA377

### **PHA478 Pharmacogenomics**

This course will provide the students with general understanding of basic pharmacogenomics principles and concepts as well as the understanding of genotype/phenotype relationships and gene-environment interactions as determinants of disease susceptibility. It will examine the molecular basis for differences in drug disposition and application of that information for individualized drug treatment regimens and disease prevention strategies. Finally, it will explore ethical, legal, social, and economic issues relevant to pharmacogenomics testing.

PR: PHA333

### **PHA452 Capstone Project**

By the time students reach fourth year (i.e.  $\geq 99$  credit hours) they will have studied a range of pharmaceutical topics, and have gained some experience of the techniques used in research, through lecture and workshop. Students will initially undertake a period of open-learning time covering research methodology and then spend a period of time on a course of specialist study. The faculty project committee has recently decided that this project should be run across Spring and Fall semesters in the fourth and final year of the program, respectively. This will enable students to investigate an area of clinical pharmacy in significant detail, under supervision.

PR: Fourth year, PHA377

**PHA590 Professional Practice Experience I (Internal Medicine)**

This rotation provides students with expertise in internal medicine. The student will develop advanced knowledge and skills needed for providing pharmaceutical care to patients with an emphasis on patients admitted in the internal medicine wards. Learning will be accomplished through ward round participation with healthcare team, student projects, presentations, and other tasks provided by the preceptor.

PR: PHA380, PHA476

**PHA591 Professional Practice Experience II (Critical Care)**

This rotation provides students with expertise in critical care medicine. The student will develop advanced knowledge and skills needed for providing pharmaceutical care to critically ill patients with an emphasis on patients admitted in the intensive and coronary care units. In addition, the student experiences skills in dosage adjustment of common medications used in the ICU and CCU. Learning will be accomplished through ward round participation with healthcare team, student projects, presentations, and other tasks provided by the preceptor.

PR: PHA380, PHA476

**PHA592 Professional Practice Experience III (Community Pharmacy Practice)**

This rotation provides opportunity for the students to build upon skills acquired during Introductory Pharmacy Practice Experiences and apply these skills in direct patient care activities in the community setting. Students are expected to participate in patient care services and deals with them in an individual capacity. During this rotation, students advance themselves in areas related to pharmacy management, extended community pharmacy services, identification of drug therapy related problems and developing pharmaceutical care plan. Learning will be accomplished through patient interviews, patient counseling, prescription analyses, written projects, oral presentations, and other routine pharmacy tasks.

PR: PHA380, PHA476

**PHA593 Professional Practice Experience IV (Hospital Pharmacy and Management)**

The Hospital Pharmacy and Management rotation provides students with expertise on various aspects of inpatient and outpatient pharmacy services. The focus areas include management of inventory, hospital formulary, narcotic drugs and crash cart. In addition, students will investigate the future aspects of pharmacy services in hospitals.

PR: PHA380, PHA476

**PHA594 Professional Practice Experience V (Infectious disease)**

The Infectious disease rotation provides students with expertise in infectious diseases. The student will develop advanced knowledge and skills needed for providing pharmaceutical care to patients admitted in hospital due to infectious diseases. During this rotation students utilize various skills learnt during the pharmacy curriculum and introductory pharmacy practice experiences. Tasks performed by students include gathering patient details, interpretation of culture sensitivity reports, patient assessments, assessment of drug therapy related problems, patient education, answering drug information inquiries, and functioning within health care team. Students accomplish their learning goals through ward round participation with healthcare team, student projects, presentations, and other tasks provided by the preceptor.

PR: PHA380, PHA476

## **B. Department Elective Courses**

### **PHA432 Arabic Language Competence in Pharmacy**

This course aims to introduce communication skills in pharmacy communications and patient assessment and management carried out in the Arabic language. Types of communication such as verbal and non-verbal and written communications and their application in patient care will be covered. Professional decision making and practical knowledge of management of common disease state will also be covered.

PR: Fourth year, PHA101, PHA370



## Department of Pharmaceutical Sciences

### A. Department Obligatory Courses

#### **PHA110 Pharmaceutical Organic Chemistry I**

This course presents the fundamentals of certain topics in organic chemistry. It covers some important areas in organic chemistry, which include aliphatic and aromatic hydrocarbons, alkyl- and aryl halides, alcohols, ethers and epoxides. It emphasizes the pharmaceutical importance of these functional groups and gives examples of their applications. Laboratory work concerning specific chemical reactions, organic synthesis, identification of organic compounds and synthesis of aspirin.

PR: NA

#### **PHA113 Pharmaceutical Organic Chemistry II**

This course is continuation to Pharm. Organic Chemistry I. The course includes basic chemical reactions and mechanisms, Stereochemistry, phenols, aldehydes, ketones, and carboxylic acid and their derivatives, properties and reactions of dysfunctional compounds, amines, aromatic and heterocyclic compounds, and introduction to organic natural products. It emphasizes the pharmaceutical importance of these functional groups and gives examples of their applications. Laboratory work concerning specific chemical reactions, organic synthesis, identification of organic compounds and synthesis of paracetamol.

PR: PHA110

#### **PHA116 Pharmaceutical Calculations**

This course enables students to perform calculations required to compound, dispense and administer medication; including: metric system and conversions between systems, doses, reducing and enlarging formulas, density, specific gravity, specific volume, percentage and ratio strength calculations, dilution and concentration, isotonic solutions, electrolyte solutions (mEq, mM, mOsmol), constituted solutions, intravenous admixtures and rates of flow, and fundamental calculations in measurement (percentage of error, aliquots, reducing and enlarging prescriptions, least weighable quantity).

PR: PHA101

#### **PHA254 Pharmaceutics I**

The course comprised of principles and techniques involved in the formulation, preparation and evaluation of solid dosage forms and drug delivery systems. It covers the physical properties of powders, preparation of bulk and divided powders, as well as effervescent and non-effervescent granules. Capsules and tablet types, methods of production/filling and storage are described. The course also covers transdermal drug delivery systems and suppositories absorption, formulation and evaluation. Description of the solid oral dosage forms and drug delivery systems that, by virtue of formulation and product design, have modified drug-release features is covered as well. Counselling patients regarding the proper use of selected solid dosage forms will be emphasized during the course.

PR: PHA116

### **PHA219 Medicinal Chemistry I**

This course covers the basic principles of medicinal chemistry. It discusses the relationship between drug-receptor interaction and the influence of chemical structure with the biological activity. The initial part of the course includes the basic topics of medicinal chemistry such as drug-receptor interaction, physicochemical properties, the effect of molecular modification on receptor binding and drug metabolism. The second part of the course is devoted to the study of chemotherapeutic agents.

PR: PHA113

### **PHA225 Pharmaceutical Analysis I**

This course covers the theoretical basis and introductory to quantitative analysis techniques including chemical equilibrium, dissociation of acids and bases, pH calculations, and buffer solutions. It also covers the fundamentals and applications of various quantitative volumetric and gravimetric methods that are used in pharmaceutical analysis.

PR: PHA113

### **PHA255 Pharmaceutics II**

This course covers basic concepts of solution dosage forms, disperse systems, semisolid preparations and sterile products, including parenteral and ophthalmic preparations; their advantages & disadvantages, formulations, quality control tests and various sterilization procedures. In addition, aseptic techniques applied during the preparations of sterile products shall be covered. Counselling patients regarding the proper use of semi-solid dosage forms and parenteral preparations will be covered during the course.

PR: PHA254

### **PHA223 Medicinal Chemistry II**

This course covers classification, chemical properties, structural features, synthesis, pharmacological mechanism, metabolism and structure activity relationship (SAR) studies of major classes of medicinal agents. The detailed knowledge and understanding about targets by various medicinal compounds are discussed with emphasis given on the chemical basis of drug action. Topics covered include adrenergic and cholinergic drugs, cardiovascular drugs, antihistamines, opioid analgesics and NSAIDs, anti-diabetics, antipsychotics and anxiolytics.

PR: PHA219

### **PHA226 Pharmaceutical Analysis II**

This course provides students with fundamentals and hands-on practice on essential instrumental techniques used in the pharmaceutical analysis. In the first part of the course, the basics of electrochemical, absorption spectrophotometric, and atomic spectroscopic methods of analysis will be covered. In the second part of the course the theory, instrumentation, and applications of a number of common chromatographic methods including thin layer liquid chromatography, gas chromatography, and high performance liquid chromatography, as well as common molecular spectroscopic techniques will be discussed.

PR: PHA225

### **PHA301 Pharmaceutics III**

This course covers theoretical background & practical demonstration of some manufacturing unit processes like particle size reduction and analysis, mixing, powder flow, and granulation that are applied in pharmaceutical industries. The course also comprises stability of drug products, packaging materials and design and operation of clean rooms, as well as pulmonary drug delivery.

PR: PHA255

### **PHA304 Biopharmaceutics and Pharmacokinetics**

This course provides a comprehensive introduction to biopharmaceutics and pharmacokinetics, focusing on the factors influencing drug absorption, distribution, metabolism, and excretion. Topics include drug sampling techniques and mathematical modeling of drug kinetics. Students will explore compartment models, linear and nonlinear pharmacokinetics, intravenous bolus and infusion dosing, as well as oral drug administration. The course also covers gastrointestinal absorption mechanisms and physicochemical influences on drug dissolution and absorption. Advanced topics include multiple-dose regimens, noncompartmental analysis, Michaelis-Menten kinetics, and metabolism. Additionally, students will learn about bioavailability and bioequivalence studies, including study design, data analysis, and regulatory considerations.

PR: PHA255

### **PHA306 Research Methodology for Pharmacy**

The course comprised of principles and techniques involved in the formulation, preparation and evaluation of solid dosage forms and drug delivery systems. It covers the physical properties of powders, preparation of bulk and divided powders, as well as effervescent and non-effervescent granules. Capsules and tablet types, methods of production/filling and storage are described. The course also covers transdermal drug delivery systems and suppositories absorption, formulation and evaluation. Description of the solid oral dosage forms and drug delivery systems that, by virtue of formulation and product design, have modified drug-release features is covered as well. Counselling patients regarding the proper use of selected solid dosage forms will be emphasized during the course.

PR: NA

### **PHA314 Clinical Pharmacokinetics and Therapeutic Drug Monitoring**

This course provides an in-depth understanding of clinical pharmacokinetics, therapeutic drug monitoring (TDM), and their application in patient care. Topics include drug absorption, distribution, metabolism, elimination, individual patient variability, and dosage regimen adjustments in special populations such as renal and hepatic disease, dialysis, heart failure, obesity, and drug interactions. Pharmacokinetics concepts are further applied to clinical dosing cases to selected category of drugs. The tutorial component focuses on the practical aspects of drug monitoring, sample collection, and data analysis for clinical decision-making.

PR: PHA304

### **PHA360 Pharmaceutical Biotechnology**

This course introduces the student to the field of biotechnology with especial emphasis on its applications in the manufacturing of biopharmaceuticals. The course entails definitions, brief history and major areas of contribution of biotechnology. The course shall also cover modern biotechnology tools and techniques including the principles of recombinant DNA technology (DNA isolation, cutting, ligation (vectors) & replication (PCR)). In addition, different methods adopted for the manufacturing of biotechnology drug products and their formulation, evaluation and stability aspects as well as potential clinical uses shall be covered. The course shall include stability aspects, bio-similarities and clinical implications of therapeutic proteins. The course shall also discuss the impact of biotechnology in the diagnostic and therapeutic management and illustrate some examples of marketed biopharmaceuticals as well as anticipate their future prospects. Current some marketed biotechnology drug products, as well as the future prospects of biotechnology shall be discussed.

PR: PHA265, PHA217

### **B. Department Elective Courses**

#### **PHA431 Complementary and Alternative Medicine (CAM)**

In this course, CAM is classified into six systems, based on different philosophies: 1- Alternative Medical Systems 2- Mind-Body System 3- Biological-Based System 4- Manipulative Body-Based System 5- Energy System 6- Blood Cupping. This in addition to Iridology as a diagnostic technique. Each of these systems include different therapies which are given in detail, including definition, philosophy, techniques, indications, and contraindications for each therapy.

PR: Fourth year, PHA370

#### **PHA433 Pharmaceutical Technology Training**

The course provides students with essential training in large-scale manufacturing of sterile and non-sterile pharmaceutical products and quality control tests. It covers quality assurance aspects, current Good Manufacturing Practice (cGMP) guidelines, as well as validation of the manufacturing processes followed during large-scale drug manufacturing.

PR: Fourth year, PHA301

#### **PHA420 Phytotherapy**

Study of Phytomedicines including their active constituents, preparation and therapeutic value relevant to Pharmacist and Complimentary Practitioners. The course also includes pharmacodynamic and pharmacokinetic studies of the active constituents to support research and development in the field of Pharmacy. Monographs and Materia Medica of Phytomedicines are included in the study.

PR: Fourth year, PHA370

#### **PHA435 Novel Drug Delivery**

This course is designed to provide students with an understanding of the current state of the art for novel drug delivery systems with a particular focus on nanocarrier systems such as nanoparticles, polymeric micelles, liposomes and solid lipid nanoparticles, for delivering small molecules. This course will introduce students to advanced technologies in colon-targeted delivery and ocular delivery. The class format will be lectures followed by critique of recent literature.

PR: Fourth year, PHA301

# PharmD Courses

## A. College Obligatory Courses

### **Advanced Pharmacotherapy I (PHP500)**

This course provides a comprehensive overview of cardiovascular diseases with a focus on the role of clinical pharmacists in prevention, diagnosis, and pharmacotherapeutic management. Topics include hypertension, heart failure, ischemic heart disease, arrhythmias, dyslipidemia, thromboembolic disorders, and cardiovascular conditions requiring critical care. Emphasis is placed on evidence-based practice, clinical guidelines, patient counseling, medication safety, and interdisciplinary collaboration.

### **Advanced Pharmacotherapy II (PHP501)**

This course aims to examine antimicrobial stewardship core elements and practices that help optimize antimicrobial use and prevent emergence of resistance. It also provides in-depth knowledge and skills concerning the therapeutic management of commonly encountered infections such as urinary, respiratory, skin and soft tissue, bone, and invasive infections.

### **Advanced Pharmacotherapy III (PHP502)**

This course focuses on providing patient-centered care to patients who have endocrine disorders or gender specific health-related needs. Learners will develop, integrate, and apply knowledge from the foundational disciplines (i.e., pharmaceutical, social/behavioral/administrative, and clinical sciences) and apply the Pharmacists' Patient Care Process for patients with these disorders.

### **Sterile Compounding & Parenteral nutrition (PHP503)**

This course provides comprehensive application in sterile compounding techniques and the clinical application of parenteral nutrition (PN). It emphasizes aseptic technique, clean room protocols, and the preparation of sterile pharmaceutical products in compliance with current standards. Students will also gain skills in designing and monitoring individualized parenteral nutrition regimens.

### **Social Pharmacy and Public Health (PHP504)**

The course aims to understand the local and global health challenges, examining the profound social determinants that shape public health and patient experiences. This course provides a comprehensive exploration of the principles and practice of public health, emphasizing the health of populations and the crucial pursuit of health equity within diverse groups. Students will learn methodological toolkits to investigate pressing public health issues and analyze medication use patterns. Ultimately, this course equips students with the skills to critically evaluate the safety and efficacy of medications within a broader public health context, paving the way for impactful practice.

### **Clinical Skills Lab (PHP505)**

This lab-based course provides students with hands-on training in essential clinical skills. Students will develop proficiency in patient assessment, physical examination techniques, documenting patient care activities, medication administration, and basic point-of-care testing. Emphasis is placed on effective patient communication, interprofessional collaboration, and application of pharmaceutical knowledge in simulated clinical settings. The course fosters critical thinking and prepares students for direct patient care roles.

### **Advanced Pharmacotherapy IV (PHP506)**

This course provides an in-depth understanding of the clinical management of pulmonary and renal diseases from a pharmaceutical care perspective. Students will explore the pathophysiology, pharmacotherapy, and evidence-based treatment strategies for common and complex conditions affecting the respiratory and renal systems. Emphasis is placed on the clinical role of pharmacists in optimizing drug therapy, monitoring patient outcomes, managing drug related problems, and participating in multidisciplinary healthcare teams.

### **Advanced Pharmacotherapy V (PHP507)**

This course provides an in-depth understanding of the clinical management of gastrointestinal, hepatobiliary, rheumatologic and central nervous system diseases from a pharmaceutical care perspective. Students will explore the pathophysiology, pharmacotherapy, and evidence-based treatment strategies for common and complex conditions affecting the gastrointestinal, hepatobiliary, rheumatologic and central nervous system. Emphasis is placed on the clinical role of pharmacists in optimizing drug therapy, monitoring patient outcomes, managing drug-related problems, and participating in multidisciplinary healthcare teams.

### **Directed Research (PHP508)**

This course aims to impart an advanced level of research skills in clinical pharmacy, research new ideas, encourage and facilitate the development of advanced pharmacy services through primary research. Furthermore, the course will help equip pharmacists capable of conceiving, implementing, and communicating research on patient care services that promote the rational, safe, effective, and economical use of drug therapy.

### **Digital Pharmacy Systems and Telehealth (PHP509)**

The purpose of this course is to explain the importance of informatics in delivering Pharmaceutical care. This course will introduce key issues & applications of Health Informatics at theoretical & applied levels. Students will explore the existing practices & recommend change based on evidence. Emphasis will be placed on current ethical, cultural, & financial issues accompanying the increasing use of the health-related Internet applications by healthcare providers, & consumers. This course will also emphasize on the use of social media as a way of delivering care and advise for patients with chronic diseases.

### **Continuing Professional Development (CPD) (PHP510)**

This course introduces pharmacy students to the principles of Continuing Professional Development (CPD), fostering self-directed learning, professional growth, and reflective practice. Students will develop competencies in goal setting, communication, time management, leadership, and documentation of achievements. Through guided mentorship and the creation of professional portfolios, students will prepare to enter advanced pharmacy practice experiences with enhanced self-awareness, adaptability, and commitment to lifelong learning.

### **Quality Assurance and Patient Safety in Healthcare (PHP511)**

This course is designed to provide an understanding of the principles of patient safety management, and develop a system patient service quality improvement in healthcare. It also discusses the basic strategies to deal with global public health threats for preventable patient harms, including medical errors and other healthcare-associated complications.

### **General Medicine I (PHP600)**

This rotation provides students with clinical pharmacy practice experience in Internal Medicine wards covering cardiovascular, respiratory, endocrinology, gastrointestinal, and immune-related diseases. Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals. The tasks performed by the students include collecting patient-specific information, assessing drug therapy, recommending evidence-based pharmacotherapeutic regimens, monitoring drug therapy, educating patients and caregivers, and teamwork. The goals of the rotation will be achieved through a variety of ways including but not limited to team rounding, preceptor shadowing, written assignments, oral presentations, and other clinical pharmacy-related tasks assigned by the onsite preceptor.

### **Communicable Diseases (PHP601)**

This rotation provides students with clinical pharmacy practice experience in dealing with patients suffering from infectious diseases. Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals. The tasks performed by the students include collecting patient-specific information, assessing drug therapy, interpreting culture sensitivity reports, recommending evidence-based pharmacotherapeutic regimens, monitoring drug therapy, educating patients and caregivers, and team work.

### **Paediatrics (PHP602)**

This rotation provides students with clinical pharmacy practice experience in pediatric patient care. Students apply pharmacokinetic principles in dosage adjustment in pediatrics and choose patient specific pediatric formulations. Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals.

The tasks performed by the students include collecting patient-specific information, assessing drug therapy, recommending evidence-based pharmacotherapeutic regimens, monitoring drug therapy, educating patients and caregivers, and teamwork. The goals of the rotation will be achieved through a variety of ways including but not limited to team rounding, preceptor shadowing, written assignments, oral presentations, and other clinical pharmacy-related tasks assigned by the onsite preceptor.

### **Ambulatory Care (PHP603)**

This rotation provides students with clinical pharmacy practice experience in outpatient settings. Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals. The tasks performed by the students include collecting patient-specific information, assessing drug therapy, recommending evidence-based pharmacotherapeutic regimens, monitoring drug therapy, educating patients and caregivers, and teamwork.

### **Emergency Care (PHP604)**

This rotation provides students with clinical pharmacy practice experience in dealing with critically ill patients admitted to intensive care units. Students are expected to apply various proficiencies learned during their curriculum to achieve the goals. The tasks performed by the students include collecting patient-specific information, assessing drug therapy, recommending evidence-based pharmacotherapeutic regimens, monitoring drug therapy, educating patients and caregivers, and teamwork. The goals of the rotation will be achieved through a variety of ways including but not limited to team rounding, preceptor shadowing, written assignments, oral presentations, and other clinical pharmacy-related tasks assigned by the onsite preceptor.

### **Drug information (PHP608)**

This rotation provides students with clinical pharmacy practice experience in handling drug information services. Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals. The tasks performed by the students include collecting patient-specific information, assessing drug therapy, recommending evidence-based pharmacotherapeutic regimens, monitoring drug therapy, educating patients and caregivers, and interprofessional collaboration.

### **Community Healthcare (PHP606)**

This rotation provides students with practice experience in managing a community pharmacy. Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals. The tasks performed by the students include collecting patient-specific information, assessing drug therapy, recommending evidence-based over-the-counter treatments, monitoring drug therapy, educating patients and caregivers, and interprofessional collaboration.

## **B. Elective Rotation (PHA6xxx)**

### **Nephrology (PHP605)**

This rotation provides students with clinical pharmacy practice experience in nephrology units (both inpatients and out patients). Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals. The tasks performed by the students include collecting patient-specific information, assessing drug therapy, dosage adjustments in renal impaired patients, recommending evidence-based pharmacotherapeutic regimens, monitoring drug therapy, educating patients and caregivers, and teamwork.

### **Pharmacy administration (PHP607)**

This rotation provides students with managerial and administrative experience in hospital pharmacy. Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals of the rotation. The course will cover areas related to human resource management, medicine procurement, inventory management, health promotion services, dealing with business challenges and communicating effectively with the healthcare team.



### **Cardiology (PHP609)**

This rotation provides students with clinical pharmacy practice experience in dealing with patients suffering from cardiac diseases. Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals. The tasks performed by the students include collecting patient-specific information, assessing drug therapy, recommending evidence-based pharmacotherapeutic regimens, monitoring drug therapy, educating patients and caregivers, and teamwork.

### **Oncology (PHP610)**

This rotation provides students with clinical pharmacy practice experience in dealing with patients suffering from different types of cancers. Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals. The tasks performed by the students include collecting patient specific information, assessing drug therapy, pain management, recommending evidence-based pharmacotherapeutic regimens, monitoring drug therapy, educating patients and caregivers, and teamwork.

### **Pain management (PHP611)**

This rotation provides students with clinical pharmacy practice experience in dealing with patients suffering from pain conditions. Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals. The tasks performed by the students include collecting patient-specific information, assessing drug therapy, recommending evidence-based pharmacotherapeutic regimens, monitoring drug therapy, educating patients and caregivers, and teamwork.

### **Surgery (PHP612)**

This rotation provides students with clinical pharmacy practice experience in Surgery wards covering antibiotic selection, post-surgical pain management and nutritional support. Students are expected to apply various proficiencies learned during their curriculum in order to achieve the goals. The tasks performed by the students include collecting patient-specific information, assessing drug therapy, recommending evidence based pharmacotherapeutic regimens, monitoring drug therapy, educating patients and caregivers, and teamwork.