The Faculty of Medical Sciences
History

The Faculty of Medical Sciences includes the Department of Basic Medical Sciences housing the Sections of Anatomy, Biochemistry, Pharmacology and Physiology; Dental Surgery, The Department of Community Health & Psychiatry; the UWI School of Nursing and the other clinical departments, located at the University Hospital of the West Indies. These include: Medicine; Microbiology; Obstetrics and Gynaecology; Child & Adolescent Health; Pathology; and Surgery, Radiology, Anaesthesia & Intensive Care.

The Office of the Dean with its Section of Undergraduate Affairs and the principal teaching hospital, The University Hospital of the West Indies are situated at the northern perimeter of the campus less than 1km from the University administration buildings.

A list of Department Heads and Officers of the Faculty can be found in the appendix at the end of this booklet. Further information on the history of the Faculty and the University of the West Indies can be found in:

Relationship of the Pharmacy Programme to the University’s Mission:

Consistent with the university’s mission to unlock West Indian Potential for economic and cultural growth, the Pharm.D. Programme was introduced to the Mona Campus as the newest programme out of the Faculty of Medical Sciences.

The Pharm.D. will produce graduates who will significantly enhance the well-being of West Indian people, and by their ability to provide effective pharmaceutical care, they will significantly impact public health and reduce health care costs in the West Indies. Additionally, the Pharm.D Programme is in accordance with the university’s transformation plan, which seeks to identify courses that are more meaningful to the development of the region.

On completion of this programme students will be able to:

1. Function efficiently as pharmacists in all pharmaceutical settings, such as manufacturing, hospital, distribution and community.
2. Demonstrate competence in the core knowledge, skills, and practices to the understanding of therapeutic problems.
3. Apply appropriate resolution in the provision of effective pharmaceutical care.
4. Actively participate in team-based professional care to promote health and wellness programmes, which are designed to enhance the quality of life of individuals and communities.
5. Exhibit critical thinking skills in the resolution of a variety of therapeutic problems.
6. Effectively communicate to all stakeholders of the health care system in order to ensure safe, efficient, effective, and equitable pharmaceutical care.
7. Interact with all stakeholders of the health care system with respect and empathy.
8. Demonstrate a zeal for life-long learning and professional development that improves pharmacy practice.
9. Exhibit ethical behaviour that provides pharmaceutical care.
10. Demonstrate professionalism in communication with all stakeholders of the health care system that fosters the best team-based approach to patient care.

Accreditation

The programme is receiving oversight by the Caribbean Accreditation Authority for Education in Medicine and Other Professions (CAAM-HP). With the first cadre of students starting 2016/17 the programme will not be eligible for full accreditation until 2022. The programme has already engages the oversight of CAAM-HP and will have reviews within the next two to three years.

Admission Criteria, Assessment and Examinations, Regulations

PROFICIENCY IN ENGLISH

Persons applying to enter undergraduate degree programmes at the University of the West Indies, Mona are required to sit the English Language Proficiency Test set by the University. Only persons who are successful in this test or who have been granted exemption will be considered for entry into the degree programme at
Mona. For information on this test, including requests for exemption, applicants are asked to check with the Admissions Section of the Registry.

REGULATIONS FOR THE DOCTOR OF PHARMACY DEGREE PROGRAMME

1. Entry Requirements

Applicants must normally have attained a minimum age of 18 years at the commencement of the academic year of entry to the Doctor of Pharmacy programme.

Applicants must submit their applications to the Senior Assistant Registrar, Student Affairs, The University of the West Indies, Mona, Kingston 7, Jamaica, by the end of the second week of January each year. For procedures concerning applications and for further information candidates should write to the Senior Assistant Registrar, Student Affairs.

Applicants required to withdraw from the Faculty for failing to complete the Doctor of Pharmacy Degree Programme within the stipulated time or because of poor performance may be considered for readmission to the Doctor of Pharmacy Programme, after at least one year has elapsed since their withdrawal.

2. Qualifications for Admission

Applicants who wish to begin the degree programme must fulfil the general University regulations concerning matriculation and, in addition, the specific requirements of the Faculty set out below.

The academic admission to the Doctor of Pharmacy Degree Programme is based on the applicant’s proficiency and attainment in any of the following, hereinafter referred to as "approved examinations"

- Caribbean Advanced Proficiency Examinations (CAPE)/General Certificate of Education Advanced ("A") Level Examinations or their equivalent.
- UWI Preliminary or Introductory Level Courses in the appropriate subjects in the Faculty of Pure and Applied Sciences (Mona), the Faculty of Pure and Applied Sciences (Cave Hill), the Faculty of Medical Sciences, St. Augustine, or the Faculty of Science and Agriculture (St. Augustine)
- Programme/Courses which are considered equivalent at institutions recognized by the University of the West Indies

The applicant must have obtained three (3) passes in the approved examinations including Biology/Zoology and Chemistry. The third subject can be Physics, Mathematics (which are the preferred subjects) or any other approved subject including one from the humanities or social sciences provided that passes have also been obtained in Physics and Mathematics at the CSEC/CXC or GCE O Level. The minimum academic standard for entry is an average of two 3’s and one 2 at Unit 2 CAPE or one B and two C’s at GCE Advanced Level.

Students currently studying at UWI in the Faculty of Pure and Applied Sciences (Mona), the Faculty of Pure and Applied Sciences (Cave Hill), the Faculty of Medical Sciences, St. Augustine, or the Faculty of Science and Agriculture, St. Augustine seeking to be transferred to the Doctor of Pharmacy Degree Programme shall only be considered from the Preliminary and/or Introductory level courses. All such students must complete and submit a Transfer Form by the end of the second week of January in the calendar year of proposed entry.

Applicants holding UWI first degrees in the natural sciences with a minimum of lower second class honours may be considered for entry.

Applicants holding professional degrees in Allied Health disciplines may also be considered for entry provided that they have attained a minimum average grade of B+ or grade point of 3.3 in the appropriate science subjects during their degree programme or Grade 3 passes in Biology/Zoology and Chemistry at Unit 2 CAPE / A Level or equivalent.

Applicants holding degrees other than degrees in the natural sciences may also be considered provided that they have attained a minimum average grade of B+ or grade point of 3.3 in the appropriate science subjects during their university programme or Grade 3 passes in Biology/Zoology and Chemistry at Unit 2 CAPE / A Level or equivalent.
Applicants with first degrees from institutions other than the UWI shall also be eligible provided that:

- The programme of study has been accredited by a relevant body or agency and is considered acceptable by the UWI.
- Credits have been obtained in Biology/Zoology and Chemistry
- A minimum grade point average of 3.0 or its equivalent has been obtained.

Applicants who have earned a BSc in Pharmacy Degree from the University of Technology (UTECH) in Jamaica or the University of the West Indies, St. Augustine Campus, will be considered for admission at the fourth year level of the proposed Pharm.D. Programme. Therefore, pharmacy graduates of UTECH and UWI, St. Augustine will be eligible for advanced standing in the proposed Pharm.D. Programme.

Non-Academic Considerations
All applicants are required to submit a short 250 - 300 word autobiographical summary outlining the reasons for their career choice.

An applicant’s chances of entry will be enhanced by documented and certified involvement in extracurricular activities in the years prior to his/her application.

- Each activity should be listed on the application form and must be accompanied by original letters of certification from principals, supervisors or employers for each activity. Both the duration of involvement and the level of responsibility of the applicant in each activity shall be taken into consideration and certifying documents must state these clearly.
- In considering these activities, the University places emphasis on applicant’s voluntary participation in community/social projects although consideration shall also be given to other extracurricular activities, experiences and abilities (such as music, sports, drama, and debating or proficiency in a foreign language).
- Applicants will be required to attend an interview.

3. Registration
Registration for courses takes place during the first week of the first semester of each academic year. Please note that the registration of a student is not complete until the appropriate tuition and other fees have been paid in respect of that student or arrangements acceptable to the Campus Principal have been made with respect to the payment of such fees.

4. Programme of Study
The programme for the Doctor of Pharmacy Degree lasts for five years and consists of two stages:

- Pre-clinical phase (mostly didactic component; 3 years); and
- Clinical Phase (mostly experiential component; 2 years).

Both stages consist of courses or clerkships in which are included lectures, conferences, seminars, tutorials, self-study, and the use of learning aids (including information technology), practical and demonstrations including clinical bedside teaching. However, the clinical (experiential) component is mostly clinical rotations.

The student’s progress in each course or clerkship is assessed on the basis of his or her performance in a combination of course-work and written, practical, clinical and oral examinations.

After completion of the clinical phase (years 4 and 5) the Doctor of Pharmacy degree is awarded at the level of a Pass, Honours, or Honours with Distinction on satisfactory completion of the programme.
5. Exemptions

An applicant who has completed a course and passed an examination from another recognized university in a subject which forms a part or the whole of an analogous subject in Doctor of Pharmacy Degree programme may apply to the Academic Board, through the Dean, for exemption and credit. The Academic Board shall make a decision on the matter after considering the recommendation of the Faculty Board which shall take into account the syllabus, the nature and duration of the course, the person’s grading in examinations in the course, the time which has elapsed since the course was completed and, in particular, whether it is analogous in whole or in part to that offered in this University.

The Faculty Board shall make one of the following recommendations to the Academic Board, indicating the reasons for the recommendation: (a) that the application be rejected; or (b) that the applicant be exempted from a part or the whole of the subject, but be required to take a part of or the full examination; or (c) that the applicant be exempted both from the course and the examination and credited with the course.

Exemption and credit shall not normally be granted to applicants who have been asked to withdraw and are re-admitted to the Faculty for whatever reason after a lapse of more than two years.

Foundation Course

Pharm D students are required to complete three (3) foundation courses (9 credits) within the pre-clinical years of the programme.

- FOUN 1014 - Critical Reading and Writing in Science & Technology and Medical Sciences (3 credits).
- LING1819 Beginner’s Caribbean Sign Language (3 credits)
- FOUN1301 - Law, Governance, Economy & Society (3 credits).

THE CURRICULUM

Mode of Delivery
The courses will be delivered through face to face didactic lectures, laboratory demonstrations, audio and video demonstrations and clinical experiences.

SHORT COURSE DESCRIPTIONS

YEAR 1

Introductory Chemistry A (CHEM1901)
This course covers introductory Analytical Chemistry, Atomic Theory, Crystal structures and symmetry elements, Born-Haber cycle. Molecular Orbital Theory for homo- and hetero-nuclear diatomic molecules, Energetics and Molecular Structure, A mechanistic approach to the chemistry of alkanes, alkenes and alkynes and an introduction to the stereochemistry of organic molecules.

Introductory Chemistry B (CHEM1902)
This course covers the main group elements based on their position in the Periodic Table. Thermodynamics, synthesis and reactions of functionalised organic compounds and an introduction to aromatic chemistry.

Human Physiology (PHYL1010)
General overview of Human Physiology including the autonomic nervous and neuromuscular system, cardiovascular system and respiratory systems. Some aspects of pathophysiology are discussed and laboratory demonstrations on lung function, ECG, C.V.S. nerve-muscle and exercise are carried out.

Development & Differentiation of a typical Animal Cell (BAMS1010)
This course aims to equip students with knowledge of the anatomical structures of a typical animal cell and the processes involved in cell development and differentiation during embryogenesis.
**Cellular Biochemistry (BIOC1020)**
This course will provide an introduction to the chemical and three-dimensional structures and physiological functions of the major biomolecules found in all living organisms. The structures and functions of representative macromolecules: proteins and nucleic acids, and how they can interact with other biomolecules, as exemplified by outlining how enzymes perform their roles in metabolism, will be discussed. Sub-cellular structures found in most cell types are bounded by biomembranes, this course will outline the physiological functions of these organelles and how the physiological properties of membranes make these possible. Cell-to-cell communication mechanisms will be discussed as well as the mechanisms by which hormones exert their effects upon cells. It will highlight the biomolecular aspects of the different stages of cell cycles and of cell-cell interactions, including cell surface receptors. The fundamental ways in which living organisms harvest energy from their surroundings will be explored; and finally the formation and properties of extracellular matrices such as bone and mollusc shells will be described.

**Practical Biochemistry 1 (BIOC1021)**
This course will introduce students to the proper use and operational limitations of the instruments commonly used in biochemistry laboratories by employing them in a series of practical experiments under expert guidance. Students will also become familiar with the analysis of the data generated by the experiments and correct methods for reporting the data and interpreted results.

**Introductory Microbiology and Molecular Biology (MICR1010)**
This course will introduce students to examples of bacteria, archaea and yeasts and the habitats/environments in which they live. The important structural features of these microorganisms will be outlined; important applications of microbiology and microbial diseases will be discussed. The fine molecular structure of genetic material and the enzymic mechanisms used in replication, gene expression and recombinant DNA technology will be introduced.

**Practical Microbiology and Molecular Biology 1 (MICR1011)**
Through a series of experiments students will isolate individual microorganisms and culture pure colonies. The effects of differing growth conditions on microorganisms will be demonstrated as will methods of killing unwanted microorganisms. Methods of quantifying microorganisms will be compared and discussed. A sample of DNA will be extracted and digested with restriction endonucleases, and the fragments obtained separated by gel electrophoresis.

**SHORT COURSE DESCRIPTIONS**

**Profession of Pharmacy (PHAR 1000; 2 credits)**
This course provides students with their first exposure to pharmacy as a profession, and the educational process for becoming a pharmacist. It relates the history and evolution of the roles of the pharmacist to contemporary practice. Students will engage in self-reflection about abilities, skills, experiences, and desires in an effort to determine their best opportunities and position in the profession. Through an active discovery process, students will learn about the current issues shaping the profession and how these events may shape their future practice. Students will also be introduced to the code of ethics, pharmacy law, the Board of Pharmacy, and contemporary pharmacy issues. Moreover, students will be introduced to basic medication orders/prescriptions and abbreviations that are essential for accurate interpretation of prescription orders. The concept of patient assessment will also be introduced. This is a one semester course of 26 hours of lectures.

**Human Immunology (PHAR 2003; 3 credits)**
The course aims to provide a basic overview of the innate and acquired immune system and the molecular and cellular mechanisms employed to combat inflammation and infection. This course focuses on the biology of the immune system in combating infections caused by common pathogens as well as major global infectious disease threats. The unique features of this course lie in its approach of understanding body’s defence mechanisms in
combating microbial, autoimmune, immune mediated diseases and cancer. This is a one semester course of 26 hours of lectures and 13 hours of tutorials.

**Biostatistics and Research Methodology Basics for Pharmacy (PHAR2017; 3 credits)**

The aim of this course is to introduce pharmacy students to the fundamental principles of biostatistics and the role of research in pharmacy practice. Students are provided with the basic skills for analyzing, interpreting and presenting drug research data including introduction to the use of contemporary computer-based statistical packages. Activities in this course will involve students critiquing scientific literature both orally and written format. Guidance through paper critique will be facilitated by the pairing of students with faculty members. This is a one semester course of 20 hours of lectures, 13 hours of tutorials, 6 hours of directed supervised research.

**Pathophysiology I (PHAR 2006; 4 credits)**

This course explores the pathophysiology of common disorders in humans. Specifically, it will focus on the etiology, pathogenesis, and epidemiology of the following: cardiovascular, respiratory, gastrointestinal, renal, neurological, psychiatric, endocrinologic, gynecologic and obstetric, and urologic disorders. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

**Pathophysiology II (PHAR 2014; 4 credits)**

This course explores the pathophysiology of common disorders in humans. Specifically, it will focus on the etiology, pathogenesis, and epidemiology of the following: immunologic, bone and joint, eyes, ears, nose and throat disorders, dermatologic, hematologic, oncologic, nutritional disorders, and infectious diseases. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

**Organic Chemistry I for Health Care Majors (PHAR 2000; 4 credits)**

The primary focus of this course is to provide Health Care Majors with a fundamentally sound understanding of the organic chemistry concepts that are most germane to the health professions. These concepts will include bonding, stereochemistry, acidity, basicity, selected types of reactions, functional group characteristics, their preparations, characterizations, interconversions and utility. This course will focus on nomenclature systems, selected reactions and preparations of Alkanes, Alkenes, Alkynes, Alkyl Halides, Alcohols, and Ethers. A concerted effort will also be made in these courses to provide information on the intimate link between organic chemistry and medicine. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

**Organic Chemistry II for Health Care Majors (PHAR 2008; 4 credits)**

This course is a continuation of organic chemistry I for Health Care Majors which is designed to provide Health Care Majors with a fundamentally sound understanding of the organic chemistry concepts that are most germane to the health professions. The course will focus on Aromatic-aliphatic Compounds, Aldehydes and Ketones, Carboxylic Acids, Amines, Phenols, Aryl Halides and Heterocyclic Compounds. These compounds will be explored through the concepts of aromaticity, electrophilic aromatic substitutions, nomenclature systems, selected reactions and preparations of aromatic-aliphatic compounds, interconversion reactions and utility. This course will also focus on spectroscopic methods. A concerted effort will also be made to provide information on the intimate link between organic chemistry and medicine. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

**Pharmaceutics I with Lab (PHAR 2004; 6 credits)**

The focus of this course is the physicochemical principles that are germane to the development of pharmaceutical formulations. These principles include pKa, pH buffer solutions, and thermodynamics, and solubility, colligative properties of solutions, isotonicity, and chemical kinetics with regard to stability of drug products. This course also explores the theories and concepts involved in the technology and design of solid dosage systems. Moreover, the course also covers the basic techniques used in the preparation of liquids, powders, capsules, and tablets, as well as the distinctive properties of these preparations. This is a one semester course of 39 hours of lectures, 13 hours of tutorials and 52 hours of laboratory work.
Pharmaceutics II with Lab (PHAR 2012; 6 credits)
Pharmaceutics II with Lab is a continuation of the study of physiochemical principles, pharmaceutical dosage forms and drug delivery systems. Upon completion of the course, students are expected to apply physicochemical concepts in the design and development of pharmaceutical formulations with emphasis on dispersion systems (colloidal, suspension, emulsion and aerosol), semisolid dosage systems, sterile dosage forms, novel and advanced dosage forms, and delivery systems and devices. In addition, the design and evaluation of dosing regimens and dosage forms (delivery systems) that overcome barriers and optimize drug action (and minimize adverse effects) will be introduced. Biochemical principles involved in the development of biotechnological pharmaceuticals will also be introduced. This is a one semester course of 39 hours of lectures, 13 hours of tutorials and 52 hours of laboratory work.

Pharmacokinetics (PHAR 2002; 3 credits)
This course will focus on the mechanisms and rates involved in absorption and disposition of drugs in the human body. Specifically, it is the mathematics of the time course of absorption, distribution, metabolism, and excretion (ADME) of drugs in the body. The course offers an introduction to basic mathematical concepts of pharmacokinetics, pharmacokinetic models, and concepts of drug elimination, drug clearance, and introduction to the impact of drug formulation on ADME. This course is required to prepare students for the level three course in Biopharmaceutics and Clinical Pharmacokinetics. This is a one semester course of 26 hours of lectures and 13 hours of tutorials.

Medicinal Chemistry I (PHAR 3000; 4 credits)
The focus of this course is the chemistry of natural and synthetic drug entities, their physicochemical properties, methods of synthesis, sources, derivatives, modes of biotransformation, and structure activity relationships. In this course, a concerted effort is made to link the chemical structure of drugs to their pharmacological, pharmacokinetic and toxicity profiles. This course review of Organic Chemistry Concepts, Organic Products as Pharmaceuticals, Physicochemical Properties of Drugs, Biotransformation of Xenobiotics, Cholinergic Neurotransmission, Cholinergic Agonists & Antagonists, Ganglionic and NMJ Blockers, Adrenergic Neurotransmission, Adrenergic Agonists & Antagonists, Sedatives, Hypnotics, Anxiolytics, Anticonvulsants, General Anaesthetics and Local Anaesthetics. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

Medicinal Chemistry II (PHAR 3012; 4 credits)
This is the second part of a two-course sequence of courses which explore the chemistry of natural and synthetic drug entities, their physicochemical properties, methods of synthesis, sources, derivatives, modes of biotransformation, and structure activity relationships. In this course, a concerted effort is made to link the chemical structure of drugs to their pharmacological, pharmacokinetic and toxicity profiles. The specific topics include neuroleptics, Central Nervous System Stimulants, Antidepressants, Drugs used to treat Parkinson’s disease, Narcotics, Pituitary Hormones, Thyroid Hormones, Antithyroid Agents, Insulin and Oral Hypoglycemic Agents, Estrogens, Progestogens & Androgen, Autacoids, Non-steroidal Anti-inflammatory Drugs, other Analgesics, Anti-Gout Agents, Steroidal Anti-inflammatory Agents, Antiasthma & Antiallergy Agents, Drugs Affecting the Gastrointestinal Tract Motility and Secretion, Drugs affecting Renin Angiotensin System, Diuretics, Antiarrhythmics, Calcium ion Channel Blockers, Nitrates & Nitrites, Positive Inotropic Agents, Antihyperlipidemics, Anticoagulants, Antibacterials, Antifungals, Antivirals, Antihelmintics, Antiproteozals and Antineoplastics. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

Pharmacology I (PHAR 3010; 4 credits)
This is the first of a two semester sequence of courses that are designed to develop students’ understanding of the pharmacological actions of drug entities, as well as their mechanisms of action, untoward effects, and therapeutic utility. Specifically, this course will focus on the following areas of pharmacology: cardiovascular, renal, endocrine, reproductive, antineoplastic, anti-infectives and gastrointestinal. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.
Pharmacology II (PHAR 3014; 4 credits)
This is the second part of a two semester sequence of courses that are designed to develop students’ understanding of the pharmacological actions of drug entities, as well as their mechanisms of action, untoward effects, and therapeutic utility. Specifically, this course will focus on the following areas of pharmacology: analgesics, local anaesthetics, anti-inflammatory, immunopharmacology, neuropharmacology and drugs of abuse. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

Toxicology (PHAR 3004; 4 credits)
This course provides the basic concepts of toxicology. The following topics will be explored: toxicodynamics, toxicokinetics, molecular mechanisms of toxicity, drug toxicity, toxins & poisons from natural sources, pesticides & herbicides, heavy metal intoxication & chelators, solvents, air pollutants, and management of poisoning. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

Pharmacognosy (PHAL3031; 3 credits)
The course will firstly examine the history of medicines from natural sources (primarily plants) and how such sources have increased with passing years to include medicines from animals and fungi. The course will focus on various natural efficacious ingredients, their grouping based on their chemistry and bioactivity and how the treatment of various ailments by traditionally used plants have contributed to the isolation and identification of current medicines. The course will also explore a sustainable approach towards natural product usage and current trends in Pharmacognosy. This is a one semester course of 26 hours of lectures and 13 hours of tutorials.

Biopharmaceutics and Clinical Pharmacokinetics (PHAR 3020; 4 credits)
The biopharmaceutics component of this course will present the principles of drug absorption or systemic availability for therapeutic effect. The course will discuss issues related to the impact of dosage forms on absorption, distribution, metabolism and excretion, in relation to the expected therapeutic outcomes. It will also focus on the skills related to therapeutic drug monitoring, designing individualized drug therapy with special considerations of pharmacokinetics/ pharmacodynamics. The clinical pharmacokinetic component will integrate the rate processes with biopharmaceutics principles for rational determination of dosage administration protocols that will optimize patients’ benefit from pharmacotherapy. Students will also develop skills in individualization of drug dosing regimens and adaptive care techniques through problem solving sessions to develop skills that will allow students to contribute to a patient management team. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

Pharmacy Law and Ethics I (PHAR 3008; 4 credits)
The basic principles of pharmacy law are reviewed as they relate to the practice of pharmacy in Jamaica and the other Caribbean countries. Many examples of how the law is applied to specific situations will be discussed. Critical thinking will be stimulated through the use of case studies involving issues in the law and ethics. Additionally, laws and ethical principles as they relate to professional and business activities will be explored. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

Pharmacy Law and Ethics II (PHAR 4020; 2 credits)
The basic principles of pharmacy law are reviewed as they relate to the practice of pharmacy in the USA. Many examples of how the law is applied to specific situations will be discussed. Critical thinking will be stimulated through the use of case studies involving issues in the law and ethics. Additionally, laws and ethical principles as they relate to professional and business activities will be explored. This is a one semester course of 13 hours of lectures and 13 hours of tutorials.

Pharmaceutical Sales and Marketing Operations (PHAR 3022; 4 credits)
The aim of this course is to expose Pharm.D. students to sales and marketing principles. It will train participants in critical marketing principles and prepares them to design and execute the personal selling element of the integrated marketing communications mix, with specific focus on pharmaceuticals. It also explores critical aspects of encouraging best practices among the sales force of pharmaceutical companies. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.
Patient Care Management Lab I (PHAR 4008; 4 credits)
This laboratory experience will simulate the actual practice of pharmacy in both retail and institutional settings and will promote practicing concepts learnt in clinical pharmacokinetics and pharmaceutical calculations. Students will practice the fundamentals of processing and filling a prescription or doctor's drug order. This course will receive pharmacy practice related to controlled substances. Additionally, students will gain experience in reviewing drug monographs, compounding medications, recommending over-the-counter medications, monitoring drug therapy and counselling patients. Emphasis will be placed on the role of the pharmacist in avoiding medication errors and fostering patient safety. This is a one semester course of 78 laboratory/practical hours and 13 hours of tutorials.

Patient Care Management Lab II (PHAR4018; 4 credits)
This laboratory experience is a continuation from Patient Care Management Lab I to simulate the actual practice of pharmacy in both retail and institutional settings and will to promote practicing concepts learnt in clinical pharmacokinetics and pharmaceutical calculations. Students will continue to learn the fundamentals of processing and filling a prescription, compounding medications, over-the-counter medications and counselling patients including use of home testing/monitoring devices. Special emphasis will be placed on preparing sterile products. Students will also receive training in immunization techniques. This is a one semester course of 78 laboratory/practical hours and 13 hours of tutorials.

Health Care Administration/Management I (PHAR 4002; 4 credits)
This course focuses on the structure, organization, delivery, regulation, and financing of the health care systems, primarily in the Caribbean and USA. The role and responsibilities of pharmacy in the health care systems, and their interactions with other health occupations are discussed. Reimbursement issues in health care are introduced and implications upon the practice of health care are discussed. This course covers the functions of management and administration (planning, organization, staffing, direction, and controlling) applied to pharmacy practice in the community and institutional settings. Additionally, this course also explores contemporary management principles, in addition to basic management principles and methods, as well as entrepreneurial, social and economic aspects of practice. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

Health Care Administration/Management II (PHAR 4012; 4 credits)
This course will offer additional pharmacy management principles that relate to contemporary pharmacy practice and present an introduction to the fundamentals of health outcomes research and pharmacoeconomic analysis. Students will be exposed to pharmacoeconomic articles and participate in discussions, which will provide them with tools useful to address the difficulties associated with implementing programmes. Through an active learning process, students will follow and interpret current issues that are shaping pharmaceutical and medical care as they discover the impact these events will have in shaping their future practice. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

THE CLINICAL PHARMACY SERIES [Fundamentals of Pharmacotherapy; 24 CREDITS]
The six courses of Clinical Pharmacy foster integration of the basic concepts of pharmacotherapy from year one through to year four of training. It is important for the students the develop the skills covered by these courses to then be able to apply the skills required in understanding efficacy, safety, rationale for treatment, realistic outcomes and parameters to monitor the progress of disease states. Each Clinical Pharmacy course runs in one semester and consist of 39 hours of lectures and 13 hours of tutorials.

The Clinical Pharmacy Series will consist of the following, each with FORUM:

FORUM
This is a weekly presentation by various stakeholders of the pharmacy profession. The underlying purpose of this series is to expose students to virtually every facet of the profession so that they can make informed decisions on the area of pharmacy practice that they are most passionate about.

Clinical Pharmacy I: Medical Terminology & Calculations (PHAR 2016; 4 credits)
This course will provide students with exposure to pharmaceutical calculations. Additionally, it is designed to provide the students with information about basic medication orders/prescriptions and the mathematical
calculations and abbreviations needed for interpretation of prescriptions. Students will be introduced to the term SOAP. This is a one semester course of 39 hours of lectures and 13 hours of tutorials/forum.

Clinical Pharmacy II: Interpretation of Lab Values, Medical Charts & SOAP Concepts (PHAR 3006; 4 credits)
This course provides the student with foundational concepts that are necessary to understand the practice of pharmaceutical care. Emphasis will be placed on understanding select laboratory values, principles of basic disease states, fundamentals of the patient medical chart, SOAP concepts, and methods for evaluating case studies. Students will also gain experience with oral and written presentations. Select concepts of professionalism and drug information will also be emphasized. This is a one semester course of 39 hours of lectures and 13 hours of tutorials/forum.

Clinical Pharmacy III: Communication in Patient Care (PHAR 3018; 4 credits)
This course is designed to expose professional pharmacy students to advanced concepts of pharmaceutical care. Emphasis is placed on developing skills necessary to effectively communicate in pharmacy practice environments. This course will also challenge students to acquire the skills necessary to successfully conduct patient assessment, develop pharmaceutical care plans, manage patient follow-up evaluations, and provide pharmacotherapy education, including pertinent information on the top 100 drugs. This is a one semester course of 39 hours of lectures and 13 hours of tutorials/forum.

Clinical Pharmacy IV: Drug Information, Informatics, & Literature Evaluation (PHAR 4004; 4 credits)
Drug information and informatics will be the primary focus of this course. Principles of drug information, drug information retrieval and analysis, literature evaluation, and verbal and written communication skills will be emphasized. Students will be able to utilize the drug information skills learned in this course to provide optimal pharmaceutical care in any pharmacy practice setting. This is a one semester course of 39 hours of lectures and 13 hours of tutorials/forum.

Clinical Pharmacy V: Non-Prescription Therapies (PHAR 4006; 4 credits)
This course is designed to familiarize the student with non-prescription (also known as Over-The-Counter) drugs and products or over-the-counter medications. Emphasis will be placed on the pharmacology of the drugs, potential disease states in which the drugs are utilized, self-administration techniques, considerations in selection of a product, and patient counselling. This is a one semester course of 39 hours of lectures and 13 hours of tutorials/forum.

Clinical Pharmacy VI: Patient Assessment, Data Collection and Therapeutic Care Plans (PHAR 4014; 4 credits)
This course is designed to develop knowledge in assessment, data collection, interpretation and evaluation profiling, and advisement will also be covered. Students will acquire skills on the development of effective therapeutic care plans. This is a one semester course of 39 hours of lectures and 13 hours of tutorials/forum.

PHARMACOTHERAPY [16 CREDITS]

Pharmacotherapy I (PHAR 3016; 4 credits)
This course explores the management of common disorders in humans. Specifically, it will focus on the efficacy, safety, rationale for treatment, realistic outcomes, and parameters to monitor the progress of the disease in the following: Respiratory, Cardiovascular, Renal and Urologic Disorders. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

Pharmacotherapy II (PHAR 4000; 4 credits)
This is the second course which explores the management of common disorders in humans. Specifically, it will focus on the efficacy, safety, rationale for treatment, realistic outcomes, and parameters to monitor the progress of the disease in the following: Gastrointestinal, Nutritional, Endocrinologic, Gynaecological and Obstetrics. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

Pharmacotherapy III (PHAR 4010; 4 credits)
This course explores the management of common disorders in humans. Specifically, it will focus on the efficacy, safety, rationale for treatment, realistic outcomes, and parameters to monitor the progress of the disease in the following: Neurological, Psychiatric, Substance Abuse, Bone, Joints, Dermatological, Ear, Nose and Throat Disorders. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

Pharmacotherapy IV (PHAR4016; 4 credits)
This is the fourth course which explores the management of common disorders in humans. Specifically, it will focus on the efficacy, safety, rationale for treatment, realistic outcomes, and parameters to monitor the progress of the disease in the following: Haematological, Oncologic Disorders, Infectious Diseases and Immunological Disorders. This is a one semester course of 39 hours of lectures and 13 hours of tutorials.

INTRODUCTORY PHARMACY PRACTICE EXPERIENCE [8 CREDITS]

Pre-Introductory Pharmacy Practice Experience (IPPE): Job Shadowing (PHAR2018; 0 credit)
This course is a fifty (50) hour IPPE to facilitate early shadowing experience with pharmacists in a community pharmacy setting to observe inter-professional activity and the interaction that takes place with patients. Students will have the opportunity to communicate using jargon appropriate for pharmacy practice and will be required to independently research at least non-prescription drug dispensed at the assigned pharmacy to gather pharmacy practice relevant information, such as dosage forms and mechanism of action. Students will complete this course during the summer semester of year one of the programme. This is a one semester course of 50 hours of job shadowing experience. Students will not receive credits.

Introductory Pharmacy Practice Experience I (IPPEI): Community Pharmacy (PHAR 2030; 4 credits)
This 4-week full time (160 hours) course is an introductory pharmacy practice experience (IPPE) that is designed to assist the student in actively participating in and experiencing the distributive functions of pharmacy and provision of pharmaceutical care in the community pharmacy practice setting. This pharmacy practice setting experience is divided into six main areas of experience: prescription processing and compounding, over the counter products, patient counselling and education, pharmacy administration and management, pharmacy law, and team interaction/education. This course runs in the summer semester of the second year. This is a one semester course of 160 hours of pharmacy practice.

Introductory Pharmacy Practice Experience II (IPPEII): Hospital/Institutional Pharmacy (PHAR 3030; 4 credits)
This course is an introductory pharmacy practice experience (IPPE) that is designed to assist the student in actively participating in and experiencing the distributive functions of pharmacy and provision of pharmaceutical care in the hospital/institution pharmacy practice setting. This pharmacy practice setting experience is divided into six main areas of experience: prescription processing and compounding, over the counter products, patient counselling and education, pharmacy administration and management, pharmacy law, and team interaction/education. This course runs in the summer semester of year three. This is a one semester course of 160 hours of pharmacy practice.

ADVANCE PHARMACY PRACTICE EXPERIENCE with SEMINARS [48 CREDITS]
The programme offers students one thousand and eight hundred (1800) hours of Advance Pharmacy Practice Experience (APPE I to IX; 45 credits) with seven compulsory APPEs:
- APPE I: Ambulatory Care
- APPE II: Community
- APPE III: Hospital/Institutional
- APPE IV: Internal Medicine
- APPE V: Acute Patient Care
- APPE VI: Infectious Diseases
- APPE VII: Paediatric Pharmacy
Students then have APPE VIII: Selective and APPE IX: Elective option. The APPEs will take place over one year and will be supported by three seminar courses (3 credits). Each APPE is 200 hours of pharmacy practice (rotations of 40 hours per week for 5 weeks).
APPE PROJECT: CLINICAL PHARMACY IMPROVEMENT RESEARCH

Students will complete a Clinical Practice Improvement Research Paper which is 40 hours of one of the APPEs in either semester 13 or 14. It is anticipated that student will work with secondary data rather than primary data, culminating in a publication ready research paper which will contribute to 30% of the APPE assessment. Students will be encouraged to submit final paper to a journal or scientific conference.

APPE I: Ambulatory Care (PHAR 4022; 5 credits)
The Ambulatory Care advanced pharmacy practice experience is designed to give students experience in treating patients who are typically not acutely ill in “out-patient” settings. These experiences could focus on the medication management of specific diseases or general care of patients with chronic conditions (such as hypertension, diabetes, asthma, hyperlipidaemia, etc.). Students will be involved in problem solving, patient medication counselling and therapeutic monitoring. In addition, they will address drug interactions, side effects, and medication adherence issues in the care of these patients.

APPE II: Community (PHAR 4024; 5 credits)
This course is an advanced pharmacy practice experience designed to assist the student in actively participating and experiencing the distributive functions of pharmacy in the community pharmacy practice setting. This pharmacy practice setting experience is divided into six main areas of experience: prescription processing and compounding, over the counter products, patient counselling and education, pharmacy administration and management, pharmacy law, and team interaction/education.

Seminar I (PHAR 4030; 1 credits)
Seminar I is the first part of a three course series that is designed to provide students with the skills, techniques, and competencies required to successfully navigate the advanced pharmacy practice experiences. In addition, these courses provide the student an opportunity and experience in preparing and presenting pharmacy related topics to colleagues and other healthcare professionals in a professional manner. Furthermore, this course involves the study of the top 200 most commonly prescribed drugs. Students will learn trade names, generic names, and mechanism of action, available strengths, available dosage forms, appropriate dosing guidelines, common adverse drug reactions, patient counselling information and clinically significant drug-drug interactions. Moreover, various stakeholders of the pharmacy profession will be invited to address the students on the need for pharmacists in various areas of pharmacy practice in Jamaica and the Caribbean. Furthermore, students will be required to perform routine pharmaceutical calculations, consistent with the requirements of the Pharmacist Licensure Examination. This is a course that runs in semester 12 for two APPEs and is 13 hours of seminars.

APPE III: Hospital/Institutional (PHAR 5002; 5 credits)
This is an advanced pharmacy practice experience that is designed to provide students with an opportunity to actively participate in the distributive functions of pharmacy in the institutional pharmacy practice settings. This pharmacy practice experience is divided into seven main areas: drug distribution, manufacturing activities, dissemination of drug and product information, patient counselling and education, pharmacy administration and management, pharmacy law, and team interaction/education.

APPE IV: Internal Medicine (PHAR 5004; 5 credits)
Advance Pharmacy Practice Experience (APPE) IV is a 5 week (200 hr.) supervised adult internal medicine rotation. This medicine experience is in an institutional acute care setting designed to provide the student with the opportunity to develop and refine the skills necessary to deliver pharmaceutical care, with an emphasis on rational drug therapy and patient outcomes. This will be accomplished by participation in the daily activities of work rounds with the internal medicine team and through consultation with other health care providers involved in the care of patients. Students will have the opportunity to apply basic pharmaceutical and pharmacological knowledge to various therapeutic issues and be introduced to various disease states encountered in clinical practice. Interaction and communication with other health care professionals for the promotion of optimal drug therapy are stressed to help the student develop a fundamentally sound professional approach to the practice of pharmacy.
APPE V: Acute Patient Care (PHAR 5006; 5 credits)
The Acute Patient Care Advanced Pharmacy Practice Experience (APPE) is one of two 5-week, full time (minimum 40 hours per week), out-of-classroom supervised experiences emphasizing direct-patient care in the inpatient, acute setting. In this APPE, students will apply didactic knowledge as they develop their professional maturity and judgment skills performing as active members of a healthcare team. Students will select one specialty area in acute pharmacy practice from multiple offerings to complete this requirement.

Seminar II (PHAR 5008; 1 credit)
Seminar II is the second part of a three course series that is designed to provide students with the skills, techniques, and competencies required to successfully navigate the advanced pharmacy practice experiences. In addition, these courses provide the student an opportunity and experience in preparing and presenting pharmacy related topics to colleagues and other healthcare professionals in a professional manner. Furthermore, this course involves the study of the top 200 most commonly prescribed drugs. Students will learn trade names, generic names, and mechanisms of action, available strengths, available dosage forms, appropriate dosing guidelines, common adverse drug reactions, patient counselling information and clinically significant drug-drug interactions. Moreover, various stakeholders of the pharmacy profession will be invited to address the students on the need for pharmacists in various areas of pharmacy practice in Jamaica and the Caribbean. Furthermore, students will be required to perform routine pharmaceutical calculations, consistent with the requirements of the Pharmacist Licensure Examination. This is a course that runs in semester 13 for four APPEs and is 13 hours of seminars.

APPE VI: Infectious Diseases (PHAR 5010; 5 credits)
The Infectious Diseases APPE is designed to introduce the student to many aspects of infectious diseases. They will develop a basic understanding of clinical microbiology, the utilization and spectrum of activity of anti-infectives, pharmacokinetic and pharmacodynamics properties and adverse effects of anti-infectives. The student will learn a systematic approach on the evaluation of each patient so that they will have an understanding of pathophysiology, presentation, diagnosis and treatment of the disease states that are covered. The student will be exposed to how to effectively communicate with other healthcare professionals their recommendations using evidence-based, patient-specific data related to infectious disease management.

APPE VII: Paediatric (PHAR 5012; 5 credits)
The Paediatric Advanced Pharmacy Practice Experience (APPE) is a 5-week, full time (minimum 40 hours per week), out-of-classroom supervised experiences emphasizing direct paediatric patient care in the ambulatory and/or inpatient settings. In this APPE, students will apply didactic knowledge as they develop their professional maturity and judgment skills performing as active members of a paediatric healthcare team.

APPE VIII: Selective (PHAR 5014; 5 credits)
The Selective Advanced Pharmacy Practice Experience (APPE) is the second of two 5-week, full time (minimum 40 hours per week), out-of-classroom supervised experiences in a variety of settings. These can include one of the following experiences: Geriatric Pharmacy, Nuclear Pharmacy, Home Infusion. Psychiatry Pharmacy, Oncology Pharmacy or Drug Information. In this APPE, students will apply didactic knowledge as they develop their professional maturity and judgment skills performing as active members of a team.

APPE IX: Elective (PHAR 5016; 5 credits)
The Elective Advanced Pharmacy Practice Experience (APPE) is a 5-week, full time (minimum 40 hours per week), out-of-classroom supervised experience in a variety of settings. These can include one of the following experiences: Hospital/Administration Pharmacy, Industrial Pharmacy, Compounding Pharmacy, Academic Pharmacy or Social and Administrative Pharmacy. In this APPE, students will apply didactic knowledge as they develop their professional maturity and judgment skills performing as active members of a team.

Seminar III (PHAR 5018; 1 credit)
Seminar III is the third part of a three course series that is designed to provide students with the skills, techniques, and competencies required to successfully navigate the advanced pharmacy practice experiences. In addition, these courses provide the student an opportunity and experience in preparing and presenting
pharmacy related topics to colleagues and other healthcare professionals in a professional manner. Furthermore, this course involves the study of the top 200 most commonly prescribed drugs. Students will learn trade names, generic names, and mechanisms of action, available strengths, available dosage forms, appropriate dosing guidelines, common adverse drug reactions, patient counselling information and clinically significant drug-drug interactions. Moreover, various stakeholders of the pharmacy profession will be invited to address the students on the need for pharmacists in various areas of pharmacy practice in Jamaica and the Caribbean. Furthermore, students will be required to perform routine pharmaceutical calculations, consistent with the requirements of the Pharmacist Licensure Examination. This is a course that runs in semester 14 for four APPEs and is 13 hours of seminars.

Academic Advisors
The Faculty assigns a member of the teaching staff to each student to serve as Academic Advisor. Students are expected to meet with the assigned person early in your course. The system of Academic Advisors is meant to provide one route for offering personal support and does not exclude other systems of student counselling nor the possibility of students approaching other members of the teaching staff for advice and assistance. The advisor will be the first port of call if a student is looking for help or advice, or need to share a problem and it need not be on a strictly academic matter. The advisor won't always be able to offer a solution but they should know where to send students and it's important that someone in the faculty knows you by name, and knows early on if you're having any kind of personal or academic difficulty.

The Pharm D Scholars Programme
The Scholars Programme of is designed to identify students with demonstrated excellence in academic achievement having an interest in postgraduate training. This program provides mentoring to year three and four students in the areas of clinical practice research, scholarship, and teaching, so as to help foster the future leaders of the profession. In addition to the standard requirements of the academic programme, the Scholars Programme student will participate in the following activities during their third and fourth year: mentoring, research, leadership, journal club, teaching activities, scholarship and professional presentations.

Inter-professional Activities and Outreach
Students in the Pharm D programme of the Faculty of Medical Sciences will enjoy the opportunity to share academic and outreach experiences with students in the medical, dental, nursing, physical therapy, radiography programmes; as well as the students being trained in the Basic Sciences of Anatomy, Physiology, Biochemistry and Pharmacology. Such a diverse association allows students to explore opportunities outside of the programme, such as graduate degrees in many disciplines.

Through the faculty activities students take part in Health Fairs/Medical Missions along with staff and licenced medical professionals.
### CURRICULUM OUTLINE STAGE 1 PRE-CLINICAL

#### YEAR 01

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<tbody>
<tr>
<td>August (weeks 3-4)</td>
<td>Semester 2 [23 credits] Jan-May (15 weeks)</td>
<td>Semester 3 [6 credits] Jun-Jul (6 weeks)</td>
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<tr>
<td>Freshman’s week (all programmes)</td>
<td>Semester 2 [23 credits] Jan-May (15 weeks)</td>
<td>Semester 3 [6 credits] Jun-Jul (6 weeks)</td>
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<tr>
<td>• Registration</td>
<td>Semester 2 [23 credits] Jan-May (15 weeks)</td>
<td>Semester 3 [6 credits] Jun-Jul (6 weeks)</td>
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<tr>
<td>• Welcome ceremony</td>
<td>Semester 2 [23 credits] Jan-May (15 weeks)</td>
<td>Semester 3 [6 credits] Jun-Jul (6 weeks)</td>
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<tr>
<td>• Campus Tours</td>
<td>Semester 2 [23 credits] Jan-May (15 weeks)</td>
<td>Semester 3 [6 credits] Jun-Jul (6 weeks)</td>
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<tr>
<td>• Dean’s Reception</td>
<td>Semester 2 [23 credits] Jan-May (15 weeks)</td>
<td>Semester 3 [6 credits] Jun-Jul (6 weeks)</td>
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<tr>
<td>• International Student Programme</td>
<td>Semester 2 [23 credits] Jan-May (15 weeks)</td>
<td>Semester 3 [6 credits] Jun-Jul (6 weeks)</td>
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<tr>
<td>• PHAR 2018 Pre-IPPE Job Shadowing [0]</td>
<td>Semester 2 [23 credits] Jan-May (15 weeks)</td>
<td>Semester 3 [6 credits] Jun-Jul (6 weeks)</td>
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|| 3 weeks |
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#### YEAR 02

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<tbody>
<tr>
<td>• PHAR 2030 IPPE I Community Pharmacy</td>
<td>• PHAR 3000 Medicinal Chemistry I [4]</td>
<td>4-WEEK Rotation Introductory Pharmacy Practice Experience (IPPE)</td>
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<tr>
<td>• PHAR 3008 Pharmacy Law and Ethics II [4]</td>
<td>• PHAR 3018 Clinical Pharmacy III: Communications in Patient Care [4]</td>
<td>4-WEEK Rotation Introductory Pharmacy Practice Experience (IPPE)</td>
</tr>
<tr>
<td>• PHAR3016 Pharmacotherapy I [4]</td>
<td>• PHAR 3018 Clinical Pharmacy III: Communications in Patient Care [4]</td>
<td>4-WEEK Rotation Introductory Pharmacy Practice Experience (IPPE)</td>
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#### YEAR 03

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<thead>
<tr>
<th>Semester 7 [19 credits] Sep-Dec (15 weeks)</th>
<th>Semester 8 [20 credits] Jan-Dec (15 weeks)</th>
<th>Summer Semester 9 [12 credits] Jun-Jul (8 weeks)</th>
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<tr>
<td>Semester 7 [19 credits] Sep-Dec (15 weeks)</td>
<td>Semester 8 [20 credits] Jan-Dec (15 weeks)</td>
<td>Summer Semester 9 [12 credits] Jun-Jul (8 weeks)</td>
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<tr>
<td>• PHAR 3004 Toxicology [4]</td>
<td>• PHAR 3020 Biopharmaceutics and Clinical Pharmacokinetics [4]</td>
<td>4-WEEK Rotation Introductory Pharmacy Practice Experience (IPPE)</td>
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<tr>
<td>• PHAR 3008 Pharmacy Law and Ethics II [4]</td>
<td>• PHAR 3018 Clinical Pharmacy III: Communications in Patient Care [4]</td>
<td>4-WEEK Rotation Introductory Pharmacy Practice Experience (IPPE)</td>
</tr>
<tr>
<td>• PHAR 3018 Clinical Pharmacy III: Communications in Patient Care [4]</td>
<td>• PHAR 3014 Pharmacology II [4]</td>
<td>4-WEEK Rotation Introductory Pharmacy Practice Experience (IPPE)</td>
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<tr>
<td>CURRICULUM OUTLINE STAGE 2 CLINICAL</td>
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<td><strong>YEAR 04</strong></td>
<td><strong>YEAR 05</strong></td>
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|  • PHAR4002 Health Care Administration/Management I [4]  
  • PHAR4000 Pharmacotherapy II [4]  
  • PHAR4008 Patient Care Management Lab I [4]  
  • PHAR4004 Clinical Pharmacy IV: Drug Information, Informatics and Literature Evaluation [4]  
  • PHAR 4012 Health Care Administration/Management II [4]  
  • PHAR 4014 Clinical Pharmacy VI: Patient Assessment, Data Collection & Therapeutic Care Plans [4]  
  • PHAR 4018 Patient Care Management Lab II [4]  
  • PHAR 4030 Seminar I [1]  
  5-WEEK ROTATION Advanced Pharmacy Practice Experiences (APPE) |  • PHAR4022 APPE I Ambulatory Care I [5]  
  • PHAR4024 APPE II Community Pharmacy[5] |
| Semester 13 [16 credits] Aug-Dec  
  ONE WEEK BREAK BETWEEN ROTATIONS (17 weeks) | Semester 14 [21 credits] Jan-Jul  
  ONE WEEK BREAK BETWEEN ROTATIONS (23 weeks) |  |
|  • PHAR 5008 Seminar II [1]  
  5-WEEK ROTATION Advanced Pharmacy Practice Experiences (APPE) |  • PHAR 5018 Seminar III [1]  
  5-WEEK ROTATION Advanced Pharmacy Practice Experiences (APPE) |  |
|  • PHAR 5002 APPE III : Hospital/Institutional [5]  
  • PHAR 5004 APPE IV: Internal Medicine[5]  
  • PHAR 5006 APPE V: Acute Patient Care [5]  
  APPE Project: Clinical Pharmacy Improvement Research Draft Paper |  • PHAR 5010 APPE VI: Infectious Disease [5]  
  • PHAR 5012 APPE VII: Paediatric [5]  
  • PHAR 5014 APPE VIII: Selective I* [5]  
  • PHAR 5016 APPE IX: Elective** [5]  
  APPE Project: Clinical Pharmacy Improvement Research Final Paper |  |

* Selectives can be chosen from: Geriatric Pharmacy, Nuclear Pharmacy, Home Infusion Pharmacy, Oncology Pharmacy, Psychiatry Pharmacy or Drug Information

**Electives can be chosen from: Hospital/Administration Pharmacy, Industrial Pharmacy, Compounding Pharmacy, Academic Pharmacy or Social and Administrative Pharmacy