

Pharmacy Department Course Description

1.	Pharmaceutical Organic Chemistry	<p>Concepts in organic chemistry that apply to pharmaceutical sciences in general and medicinal chemistry in particular are covered in this course. It concentrates on a few key areas that are necessary to understand drug metabolism, drug-receptor interactions, drug mechanisms of action, and drug formulation from a chemical and physicochemical perspective. The first part of the course covers functional groups, focusing on ideas like conjugation, acid-base chemistry, and resonance. The mechanisms of some organic reactions that are closely related to drug metabolism and the mechanisms of action of certain drugs will be covered in relative detail throughout the course. A summary of heterocycles, stereochemistry, bonding, and drug-receptor interactions are also included in the course.</p>
	PHB110	
2.	Introduction to Pharmacy & Law	<p>This introductory course presents the students with an overview of the science and practice of pharmacy, the disciplines that comprise the profession, and areas of practice, including the history of pharmacy, the role of the pharmacist, pharmaceutical dosage forms, and the legal aspects of pharmacy practice in the UAE. This presents students with the scope of pharmacy practice enabling the choice of career direction early in the pharmacy curriculum at Fatima College of Health Sciences.</p>
	PHB120	
3.	Pharmacology 1	<p>This course imparts students with fundamental knowledge in pharmacology and clinical aspects of medications, specifically focusing on the Autonomic and Central Nervous System, respiratory system, and autacoids. The objective is to enhance students' comprehension of pharmacodynamics and pharmacokinetic properties of drugs, enabling them to assess relevant factors in the management of patients with conditions related to the ANS, CNS, and respiratory systems. Additionally, the course equips students with the foundational knowledge necessary for therapy decision-making, managing individuals with various common mental health, neurology, and respiratory disorders, covering both the pharmacology and clinical aspects of medications.</p>
	PHB 214	
4.	Medicinal Chemistry 1	<p>Medicinal Chemistry is a multidisciplinary field that integrates principles of organic chemistry, biochemistry, pharmacology, and molecular biology to discover, design, and develop therapeutic agents for the treatment of diseases. This course provides students with an in-depth understanding of the drugs' pharmacokinetics (absorption and metabolism) and pharmacodynamics, as well as the influence of drugs' physicochemical properties, Structural-Activity relationships (SAR), and Chemical mechanism of action. This course is horizontally integrated with Pharmacology 1, and therapeutics courses. Such as the Medicinal Chemistry of Autonomic and Central Nervous System, Respiratory System, and Autacoids, course is designed to provide pharmacy students with a comprehensive understanding of the basic chemical principles. It familiarizes the student with the organic medicinal agents' chemistry, which is essential for efficient professional practice. In addition to providing pertinent information on the chemistry of drugs currently in use, enough focus is also</p>
	PHB211	

		placed on fundamental concepts to allow practitioners to stay proficient in drug chemistry throughout their professional careers.
5.	Pharmaceutics	This course builds a firm understanding of the physicochemical basis of pharmaceuticals and its impact on a drug's biopharmaceutical characteristics. This will set the foundation for students to understand the formulation of pharmaceutical dosage forms. This course subsequently covers principles and techniques involved in the formulation, preparation and evaluation of mono and biphasic liquid dosage forms.
	PHB216	
6.	Basic & Clinical Biochemistry	This course aims to introduce pharmacy students to essential elements of biochemistry. The course covers the structure and properties of biomolecules, nucleic acid metabolism, the characterization of major metabolic pathways. In the process, students will develop their abilities to integrate the fundamentals of biochemical information and their application to clinical practice.
	PHB213	
7.	Pharmacology 2	This course explores the complex realm of cardiovascular, gastrointestinal, and endocrine drugs, equipping students with a deep understanding of the mechanisms of action, therapeutic applications, and potential adverse effects linked to medications that impact these crucial systems. Through a blend of lectures and case studies, students will cultivate a robust knowledge foundation, allowing them to critically analyze and apply pharmacological principles in authentic clinical situations. The course emphasizes evidence-based decision-making, therapeutic monitoring, and the incorporation of drug therapy within the context of holistic patient care.
	PHB215	
8.	Medicinal Chemistry 2	This course is horizontally integrated with Pharmacology 2 (PHB215), in this course, we will provide the chemical basis for the interdisciplinary field of therapeutics, such as the Medicinal Chemistry of Cardiovascular, Gastrointestinal, and Endocrine Drugs course provides pharmacy students with a comprehensive exploration of the chemical properties, chemical mechanisms of action, and therapeutic applications of drugs targeting the cardiovascular, gastrointestinal, and endocrine systems. Through a blend of theoretical lectures, laboratory experiments, and case studies, students will delve into the molecular basis of drug interactions with physiological targets, including receptors, enzymes, and ion channels, relevant to these systems. Emphasis will be placed on understanding structure-activity relationships, pharmacokinetics, and pharmacodynamics of medications, as well as the integration of medicinal chemistry principles with pharmacological concepts to optimize therapeutic outcomes while minimizing adverse effects. Additionally, students will explore emerging trends in drug development and design, including novel therapeutic targets, drug delivery systems, and personalized medicine approaches for certain biological systems.
	PHB212	
9.	Microbiology & Immunology	This course covers fundamentals of microbiology and epidemiology. Students learn bacteriology, mycology, and virology. Emphasis will be given to classification, identification, and cultivation of bacteria. Bacterial, fungal, and viral diseases, drugs and vaccines used in these diseases also covered. Later, the course introduces role of immunology and protection from various infectious diseases. Human-microbe interaction, role of innate immunity, presentation of antigen and development of adaptive immunity will be taught. An introduction to autoimmune disorders and the use of antibodies in various medical conditions will also be provided.
	PHB217	

10.	Pharmaceutical Calculation	This course focuses on developing proficiency in foundational mathematical calculations essential for pharmaceutical sciences. Students will gain an understanding of international systems of units and measurements pertinent to pharmaceutical practice. The course emphasizes the interpretation of prescription orders and the execution of precise calculations for prescription preparation. Through practical applications, problem-solving exercises, and real-world scenarios, students will develop the skills and knowledge necessary for accurate and effective pharmaceutical calculations, ensuring their competence in pharmaceutical practice.
	PHB222	
11.	IPPE 1 - Introductory Pharmacy Practice Experience 1	This course is designed to provide students with an understanding of the pharmacy supply chain and the role of community pharmacy in providing healthcare services. Students will gain insights into the various aspects of the pharmaceutical industry, including manufacturing, distribution, and dispensing.
	PHB223	
12.	IPPE 2 - Introductory Pharmacy Practice Experience 2	This course provides students with the opportunity to apply the knowledge and skills learned in the classroom to a real-world community pharmacy setting. Students will work under the supervision of experienced pharmacists to gain hands-on experience in all aspects of community pharmacy practice.
	PHB223	
13.	Pharmacotherapy 1	This course provides students with a thorough grasp of therapeutic principles about neurological, psychiatric, and inflammatory disorders. Geared towards refining students' proficiency in discerning and critically evaluating relevant factors, the curriculum centres on the adept management of patients dealing with conditions affecting the nervous system, mental health, and inflammatory disorders. It is meticulously structured to seamlessly integrate drug therapy into holistic management plans for neurological, psychiatric, and inflammatory disorders. By cultivating a profound understanding of pharmacological aspects and their practical application, the course empowers students to make meaningful contributions to the comprehensive care of patients with diverse medical needs in these specialized domains. Through interactive discussions, case studies, and hands-on experiences, the course aims to equip pharmacy students for excellence in their roles within neurological care and inflammatory diseases, ultimately contributing to enhanced patient outcomes.
	PHB321	
14.	Pharmaceutical Care	This course is crafted to empower pharmacy students with the knowledge and skills essential for delivering patient-centered pharmaceutical care. Upon completion of the course, students will master the art of designing effective pharmaceutical care plans tailored to individual patient needs, showcasing proficiency in identifying, preventing, and resolving drug-related problems through comprehensive medication reviews and evidence-based interventions.
	PHB320	
15.	Pharmaceutical Analysis	The course provides fundamental knowledge of the principles and techniques of pharmaceutical analysis used for qualitative and quantitative analysis of drugs. It introduces the theoretical background, practical skills,

	PHB315	and regulatory requirements for analysing pharmaceutical drugs and their formulations. It equips students with practical experience in a wide range of modern instrumentations and techniques.
16.	Evidence-Based Pharmacy	This course is developed to improve students' knowledge regarding the following topics: introduction to evidence-based practice/medicine (EBP/EBM), basics of research and statistics (including measures, reliability, validity, and ethical concerns), assessment of clinical research proposals and reports, an overview of the FDA drug approval processes, and the five steps of EBP (identifying/formulating answerable questions, conducting information searches using active strategies, critically evaluating evidence, applying evidence in practice, and assessing EBP). Additionally, it introduces fundamental concepts related to drug information services, drug information requests, sources of drug information, evaluating internet health information, pharmacy information systems, drug utilization review, limitations of study designs, quality use of medicine, drug audits, continuing education for pharmacy and medical professionals, formulary management, and the utilization of micro-medics and up-to-date databases.
	PHB323	
17.	Institutional Pharmacy Practice	The course will provide students with knowledge about different aspects of hospital pharmacy and the role of pharmacists in aged-care facilities and palliative care. The course will focus on medication management reviews, drug information, clinical pharmacy, and optimization of drug treatment for the individual patient. The aim of this course is to provide the foundation necessary for students to enter a hospital practice environment and have a clear understanding of the different departments and roles a pharmacist may participate in patient-centered pharmaceutical care.
	PHB324	
18.	Pharmacotherapy 2	This pharmacotherapy course is specifically designed to provide pharmacy students with a comprehensive understanding of the therapeutic management of cardiovascular, respiratory, and gastrointestinal conditions. The curriculum extensively covers the pharmacological principles, mechanisms of action, and clinical applications of medications used to treat these prevalent disorders. The course adopts an interdisciplinary approach, incorporating the synthesis of pharmacotherapy with lifestyle modifications and other non-pharmacological interventions, along with collaboration with healthcare professionals to ensure comprehensive patient care. Additionally, the focus on patient-centered care emphasizes personalized therapy, considering patient-specific factors, adherence, and monitoring. Case studies and simulated patient scenarios are employed to refine clinical decision-making skills. The course also explores emerging therapies and research trends, delving into cutting-edge advancements in pharmacotherapy for cardiovascular, respiratory, and gastrointestinal disorders. Rigorous critical evaluation of evidence-based practices is emphasized. Through a dynamic blend of theoretical knowledge and practical applications, this course empowers students to navigate and contribute effectively to the evolving landscape of pharmacotherapy, enhancing their ability to improve patient outcomes in diverse healthcare settings.
	PHB322	

19.	Pharmaceutical Technology	This course covers pharmaceutical manufacturing processes and quality control for capsules and tablets. Unit operations such as size reduction, powder flow, granulation, mixing, and compression will be covered. It also covers chemical kinetics, expiry date calculations, factors influencing drug and dosage forms stability as well as pre-formulation studies. The course also includes basic formulation principles and characteristics of aerosols and semisolids dosage forms. Later, it also introduces novel drug delivery systems.
	PHB317	
20.	Biopharmaceutics and kinetics	This course covers factors influencing oral absorption of drugs and various reasons for poor absorption and reduced bioavailability. It also covers transport of drugs across the membrane and metabolic pathways. Later, students will learn drug disposition by studying compartmental and non-compartmental pharmacokinetic analysis. Effect of protein binding and metabolism on drug clearance will also be covered.
	PHB318	
21.	Non-RX Pharmacotherapy	This course aims to acquaint students with non-prescription drugs, commonly known as over the counter (OTC) medications. When patients approach a pharmacist with a medical issue, the pharmacist's initial task is to decide if the issue can be handled through self-care. The course will focus on clinical scenarios where OTC products can be used in an evidence-based approach. It covers topics such as the causes of possible medical conditions treated with these drugs, drug pharmacology, self-administration methods, product selection considerations, and patient counseling.
	PHB325	
22.	Public Health & Vaccination	This course aims to provide a thorough understanding of the various facets of public health, with a focus on vaccination strategies and their role in maintaining and enhancing global health. Also, it will delve into the critical role of pharmacists in promoting public health and preventing diseases through vaccination.
	PHB327	
23.	IPPE 3 - Introductory Pharmacy Practice Experience 3	In this placement, Students will understand unit-based pharmacy services, drug information services, hospital drug formulary management, outpatient dispensing, distribution services, and specialized sterile and cytotoxic dispensing. The course focuses on applying theoretical knowledge to various operational units within a hospital setting.
	PHB326	
24.	PIE - Pharmaceutical Industry Experience	The industrial placement provides an applied understanding of dosage form design, basic industrial processes in production, quality control and product packaging units that extends the theoretical knowledge of these operational units. The course enables to identify the main roles and responsibilities of industrial pharmacists by observing the industrial activities in research and development, quality control, production, marketing, and regulatory department.
	PHB319	
25.	Pharmacotherapy 3	This Pharmacotherapy course delves into the therapeutic management of Endocrine, Renal, and Urological disorders, with a strong emphasis on the integral role pharmacists play in patient care. Exploring the pharmacological principles, mechanisms of action, and clinical applications of medications specific to these conditions, the course entails an in-depth study of diseases like diabetes, thyroid disorders, and hormonal
	PHB423	

		<p>imbalances. Students examine pharmacological interventions for renal impairments, including chronic kidney disease and glomerular disorders, as well as the analysis of urological conditions such as urinary tract infections, benign prostatic hyperplasia, and erectile dysfunction. The curriculum considers the mechanisms of action of drugs used in urological disorders and the impact of medications on renal function and overall patient health. Understanding the role of medications in restoring hormonal balance and managing endocrine-related diseases is a focal point. Throughout the course, there is an emphasis on the pharmacist's pivotal role in therapeutic decision-making, patient education, and medication management, achieved through collaboration with healthcare teams. Real-life case studies and practical scenarios are incorporated to enhance critical thinking and decision-making skills. The overarching goal is to empower pharmacy students with the knowledge and skills necessary to assume a central role in the therapeutic management of endocrine, renal, and urological disorders.</p>
26.	<p>Pharmacoepidemiology & Pharmacovigilance PHB420</p>	<p>The course is designed to provide students with a comprehensive understanding of the principles and methods used in pharmacoepidemiology and pharmacovigilance. This course delves into the study of the utilization and effects of drugs in large numbers of people, focusing on the identification and assessment of drug-related problems. It also covers the systematic monitoring, detection, assessment, understanding, and prevention of adverse effects or any other drug-related problems.</p>
27.	<p>Pharmacy Management & Pharmacoeconomics PHB422</p>	<p>This course combines evidence-based management theories with practical solutions and is designed to impart crucial skills to pharmacy students for all practice settings. It covers leadership, budgeting, human resource management, inventory management, financial statements, risk management in pharmacy settings, and marketing, providing a well-rounded foundation for future pharmacy practitioners. The course emphasizes the development of analytical and decision-making skills necessary for devising basic marketing strategies within the pharmacy context. The Pharmacoeconomics component explores concepts and applications, addressing diverse evaluation methods to assess the costs, risks, and benefits of therapies. This equips students with decision-making proficiency based on a variety of pharmacoeconomic evaluation approaches.</p>
28.	<p>Advanced Drug Delivery & Development PHB410</p>	<p>The course will address advanced oral drug delivery technologies and targeted drug delivery systems for non-oral drug delivery routes, including transdermal, pulmonary, nasal, buccal, rectal, vaginal, ocular, intramuscular and subcutaneous with a detailed understanding of the specific biopharmaceutical and formulation considerations. This course also covers new drug development process for novel therapeutic agents, bioequivalence studies for generic formulations and good manufacturing practices and quality assurance in the pharmaceutical industry.</p>
	<p>Research Methodology PHB411</p>	<p>This course offers a concise overview of various methodologies including qualitative, quantitative, and mixed methods, with a strong focus on choosing the right approach and understanding its philosophical background. The course is designed to develop essential skills in creating effective introductions, purpose statements,</p>

		research questions, and hypotheses for research studies. Incorporating case studies from contemporary pharmaceutical research, students will enhance their abilities in critical analysis and ethical evaluation, preparing them for advanced research in their field.
29.	Pharmaceutical Compounding	The Pharmaceutical Therapeutic Compounding course offers a comprehensive overview of tailored medication preparations for individual patients. This course combines both theoretical and practical learning to cover essential concepts and techniques in medication preparation. Students will delve into fundamental compounding principles, including sterile and nonsterile techniques, regulatory standards, hazardous drug handling, quality assurance, therapeutic applications, and ethical responsibilities. Additionally, hands-on laboratory activities provide the opportunity for students to apply their knowledge and develop the necessary skills and ethical framework for success in pharmaceutical compounding practice.
	PHB421	
30.	Pharmacotherapy 4	The Pharmacotherapy of Infectious Diseases and Dermatology Disorders course is meticulously designed to provide pharmacy students with a profound understanding of managing infectious diseases and dermatological conditions. The curriculum extensively covers the pharmacological foundation of antimicrobial agents, emphasizing mechanisms of action and clinical applications. Special attention is given to the pharmacist's pivotal role in promoting antimicrobial stewardship and addressing challenges associated with infectious diseases. Through engaging lectures, case studies, and practical scenarios, students acquire essential knowledge and skills for navigating infectious disease intricacies. The overarching goal is to prepare students for a pivotal role within interdisciplinary healthcare teams, enabling effective contributions to infectious disease treatment and prevention while advocating for responsible antimicrobial use. Simultaneously, the course on Dermatology Disorders provides students with a comprehensive understanding of therapeutic principles related to skin health. Emphasizing the pharmacological foundation of dermatological agents, the course highlights the pharmacist's essential role in dermatological care. It explores pharmacotherapy protocols for common skin disorders, integrating evidence-based approaches and individualized patient care. With a dual focus, the course aims to prepare students to adeptly contribute to both infectious disease management and dermatological care within the healthcare landscape.
	PHB424	
31.	Pharmacogenomics & Precision Medicine	The Pharmacogenomics & Precision Medicine course delves into the fusion of genetics, pharmacology, and healthcare, aiming to optimize drug therapy tailored to individual patients. Through a multidisciplinary approach, students explore key principles and applications, including genetic variations affecting drug response, genomic technologies like sequencing and genotyping, and how pharmacogenomic data personalizes drug therapy and informs dosage decisions. Ethical, legal, and social considerations, along with integration strategies into clinical practice, are addressed. The course also examines precision medicine's role across disease management, emphasizing patient education and counseling. Interactive lectures, case studies, and discussions facilitate a
	PHB425	

		comprehensive understanding, equipping students to navigate the evolving realm of personalized medicine and enhance patient care outcomes.
32.	Digital Pharmacy & Informatics	This course is designed to introduce pharmacy students to telehealth, tele-pharmacy, and the use of artificial intelligence in pharmacy practice, with a focus on automation and robotics, driven by the COVID-19 pandemic. It aims to equip graduates with the skills needed for the changing healthcare landscape, emphasizing digital health and information technology. Students will learn to facilitate telepharmacy services within interdisciplinary teams and apply these skills in real-world settings. Topics covered include digital health tools, remote counseling, patient monitoring, electronic health records, e-prescribing, online pharmacy, telemedicine/telehealth, digital therapeutics, blockchain, ethics, innovation, data privacy, e-professionalism, reimbursement for digital health services, cybersecurity, mobile apps, wearable devices, clinical decision-making, and digital health literacy.
	PHB426	
33.	Phytotherapy	Phytotherapy in Pharmacy Practice is a comprehensive course covering herbal medicines and marine products, offering pharmacy students a detailed understanding of their principles, applications, and evidence-based use in clinical settings. Through a blend of theory and practice, students explore pharmacology, therapeutic effects, safety considerations, and regulatory aspects of both herbal and marine-based remedies. Key topics include an introduction to phytotherapy and marine products, pharmacognosy, evidence-based evaluation, therapeutic applications, safety considerations, regulatory standards, and patient counseling. Through case studies, practical demonstrations, and discussions, students enhance their understanding and gain the skills needed to integrate evidence-based herbal and marine medicine into pharmacy practice, ensuring safe and effective patient care.
	PHB427	
34.	Research Proposal	This course will engage students in a comprehensive exploration of their research interests through the development of a research proposal. Focused on producing a literature review within their chosen topic, students will work both independently and collaboratively within a group setting, under the supervision of faculty members. This course serves as a foundational platform for students to cultivate their research skills, critically analyze existing literature, and formulate a coherent research proposal. Beyond its immediate academic objectives, the proposed research will lay the groundwork for future graduation projects, providing a springboard for students to embark on in-depth investigations in their chosen areas of interest. Through this course, students will not only enhance their understanding of research methodologies but also develop the skills necessary to contribute meaningfully to the evolving landscape of pharmacy.
	PHB412	
35.	*IPPE 4 - Introductory Pharmacy Practice	

	<p>Experience 4 (Academic and education)</p> <p>PHB723</p>	<p>In this rotation, students will cultivate a deep comprehension of educational theories and methodologies. They will utilize this knowledge to design, implement, and assess one or more educational programs. This process will involve a thorough examination and application of relevant scholarly articles and research findings to bolster the activities undertaken during this rotation. Students will engage in critical analysis of current educational literature to inform their program planning and execution, ensuring their approaches are evidence-based and effective. Additionally, they will learn to adapt educational strategies to various learning styles and environments in addition to understanding the concepts of curriculum development & its quality assurance. This hands-on experience in educational program development and evaluation will enhance their pedagogical skills, preparing them for future roles where education and training are integral.</p>
36.	<p>*IPPE 4 - Introductory Pharmacy Practice Experience 4 (Dig Health and automation)</p> <p>PHB724</p>	<p>The "Digital Health and automation" training is designed for pharmacy students, focusing on integrating digital health into pharmacy practice. It covers the fundamentals of digital health, telepharmacy, digital therapeutics, data privacy, patient-centered technologies, and the latest innovations like AI in pharmacy. The course employs case studies, group discussions, and presentations from industry experts for a comprehensive learning experience. Students are assessed through participation, written assignments, and a final project involving digital health solutions. Preceptors and instructors play a crucial role in mentoring and guiding students through real-world applications. Students are expected to actively participate and demonstrate their understanding of digital health principles. The training course, a crucial part of the Introductory Pharmacy Practice Experiences (IPPE), prepares students to be proficient in the rapidly evolving field of digital health in healthcare.</p>
37.	<p>*IPPE 4 - Introductory Pharmacy Practice Experience 4 (Pharmaceutical marketing)</p> <p>PHB725</p>	<p>The Introductory Pharmacy Practice Experience (IPPE) in Pharmaceutical Marketing equips pharmacy students with foundational knowledge of marketing within the pharmaceutical industry. Through hands-on learning and practical exposure, students explore key aspects such as market analysis, promotional strategies, and regulatory compliance. They explore into fundamental concepts, conduct market research, and study various promotional methods. Emphasis is placed on understanding regulatory frameworks and fostering professional communication and ethical practices. Practical experiences, including shadowing professionals and engaging in marketing projects, allow students to apply theoretical learning in real-world contexts. Through reflective practice, students evaluate their experiences and develop skills for continuous improvement. By the course's conclusion, students gain a solid understanding of pharmaceutical marketing principles and practical skills applicable to future pharmacy careers, offering valuable insight into this dynamic industry.</p>
37.	<p>*IPPE 4 - Introductory Pharmacy Practice Experience 4</p>	<p>The Pharmacovigilance & Regulatory Affairs Placement is a specialized placement providing pharmacy students with practical experience in pharmacovigilance and regulatory affairs. The key objectives include exploring pharmacovigilance principles, hands-on experience in adverse reaction monitoring, and</p>

	(Pharmacovigilance & RA) PHB726	understanding its role in ensuring patient safety. Students will navigate regulatory frameworks, learn document compilation for drug approval, and grasp effective communication with regulatory agencies. The placement covers drug safety monitoring, risk management, quality assurance, and ethical considerations. Engaging with industry professionals and staying current on trends equips students for roles in ensuring compliant drug development and post-marketing surveillance. This experiential placement enhances students' skills for contributing to the pharmaceutical industry's safe and regulated practices.
38.	*IPPE 4 - Introductory Pharmacy Practice Experience 4 (Drug Discovery and development) PHB727	The objective of this course is to impart thorough knowledge of the drug discovery process to conducting clinical trials, including past, present, and future trends, and to foster the development of skills in program design for preclinical development, lead optimization, and discovery. Learn about the different phases of nonclinical drug development and how a new compound's therapeutic profile is determined. Learn about the process of developing clinical drugs and how an experimental treatment is evaluated for human safety and efficacy.
39.	*IPPE 4 - Introductory Pharmacy Practice Experience 4 (Forensic Medicine) PHB728	This foundational experience aims to equip students with a solid understanding of applying pharmaceutical knowledge in forensic investigations and legal contexts. Key components include exploring pharmacological concepts relevant to forensics, understanding medications' role in legal cases, and gaining hands-on experience in toxicological principles and drug analysis techniques. The course dig in legal and ethical considerations within the pharmacy and forensics intersection, emphasizing the pharmacist's role in legal proceedings. It also covers forensic pharmacy in crime scene investigations, emphasizing collaboration with law enforcement through effective communication and simulated scenarios. Students receive training in accurate documentation and reporting of pharmaceutical evidence, preparing them for future pharmacy practice by instilling a comprehensive understanding of the diverse applications of pharmaceutical knowledge in legal and forensic settings.
40.	Pharmacotherapy 5 PHB526	The Pharmacotherapy in Oncology and Haematology course is meticulously designed to provide pharmacy students with a comprehensive understanding of the principles, applications, and challenges inherent in chemotherapy, specifically tailored for the treatment of cancer and haematological disorders. This curriculum delves into the pharmacological foundations of chemotherapy agents, intricately studying their pharmacodynamics and pharmacokinetics. Special attention is given to understanding the cellular targets and mechanisms of action specific to anticancer drugs. The course places a strong emphasis on the integral role of pharmacists in supporting oncology and haematology teams. Students will learn to ensure the safe and effective utilization of medications while adeptly managing therapy-related challenges. Topics covered include a

		comprehensive analysis of both common and severe side effects associated with chemotherapy, accompanied by strategies for managing and mitigating adverse effects, with a particular focus on supportive care. Pharmacy students will be immersed in the multidisciplinary nature of oncology care, understanding their pivotal role within collaborative teams. This involves integration into treatment planning, active participation in patient education, and diligent therapeutic monitoring. The curriculum delves into emerging trends in chemotherapy, discussing cutting-edge advancements, novel therapies, and targeted approaches in the dynamic field of cancer treatment. Ethical considerations in chemotherapy administration are thoroughly examined, ensuring students grasp the ethical dimensions of patient care. Principles of patient-centered care are woven into the course, enhancing communication skills and support throughout the treatment process. Through interactive discussions, case studies, and hands-on experiences, the course aims to equip pharmacy students with the knowledge and skills needed to excel in their role within oncology and haematology care, contributing significantly to improved patient outcomes in the challenging and evolving landscape of cancer therapy.
41.	Clinical Pharmacokinetics and drug Toxicity	The Clinical Pharmacokinetics course equips pharmacy students with a comprehensive understanding of factors influencing drug blood concentrations, focusing on those with a narrow therapeutic index and the assessment of drug toxicity in clinical settings. Key objectives include proficiency in calculating essential pharmacokinetic parameters, interpreting scientific monographs, comprehending organ roles in drug elimination, designing tailored dosage regimens, and understanding the significance of peak and trough drug levels. The course integrates theoretical knowledge with practical applications through case studies and hands-on calculations, preparing students to navigate clinical pharmacokinetics complexities and contribute effectively to patient-centered pharmaceutical care.
	PHB520	
42.	Medication Therapy Management	This course is designed to provide students with an in-depth understanding of Medication Therapy Management (MTM) principles, practices, and applications in contemporary pharmacy settings. The course explores the critical role of pharmacists in medication review and optimizing patient outcomes through effective medication management.
	PHB521	
43.	Graduation Research Project	The Graduation Research Project builds upon the foundational knowledge and skills acquired during the preceding Research Proposal course. This collaborative group project provides students with a unique opportunity to contribute new insights, address relevant research questions, and proactively solve challenges in their chosen field. Guided by faculty supervision, students will work both independently and as a cohesive team, honing their research and critical evaluation skills, essential for future roles as pharmacists. The course places a central focus on project planning, the development of robust methodologies, data analysis, and the effective dissemination of results. Students will not only assess the significance of their findings but also craft comprehensive reports, showcasing their ability to apply research principles in a real-world context.
	PHB513	

44.	APPE-1 Internal Medicine	During this rotation, students will acquire proficiency in internal medicine. Emphasis will be placed on developing advanced knowledge and skills necessary for delivering pharmaceutical care, particularly to patients admitted in the internal medicine wards. Learning opportunities will be facilitated through active participation in ward rounds alongside the healthcare team, engagement in student projects, presentations, and completion of tasks assigned by the preceptor.
	PHB531	
45.	APPE-2 Surgery	The Surgery Placement for pharmacy students offers a hands-on program focused on integrating pharmaceutical knowledge with surgical care in the healthcare sector. Students will gain practical insights into medication management throughout the surgical process, emphasizing optimization for enhanced patient outcomes. The key objectives include preoperative assessments, intraoperative support, postoperative care, and pain management, fostering collaboration within interdisciplinary surgical teams. Participants will become proficient in pharmacy protocols, patient education, infection control, and antimicrobial stewardship. This placement aims to equip students with valuable skills and experiences for a seamless integration of pharmaceutical expertise in surgical settings, preparing them for optimal patient care.
	PHB532	
46.	APPE-3 Ambulatory Care	This course provides students with an immersive learning experience in the field of ambulatory healthcare services through supervised clinical placement in primary care setting. Students will explore issues related to ambulatory healthcare services and will play active role in the day-to-day activities of the pharmacy. They will work with other healthcare professionals and experience how the provision of primary care to patients is a team approach that includes pharmacy.
	PHB533	
47.	APPE-4 Critical Care	During this rotation, students will gain expertise in critical care medicine. The focus will be on developing advanced knowledge and skills essential for delivering pharmaceutical care to critically ill patients, with a particular emphasis on those admitted to the intensive and coronary care units. Additionally, students will acquire proficiency in dosage adjustment of common medications utilized in the ICU and CCU. Learning experiences will be facilitated through active participation in ward rounds with the healthcare team, engagement in student projects, and presentations, and the completion of tasks assigned by the preceptor.
	PHB534	
48.	Pharmacy Elective (Cosmetic Formulations)	The course is designed to enable the student to be familiar with specific ingredients used in cosmeceutical and cosmetic formulations and their technical aspects especially related to skin, hair and nail cosmeceuticals. This module includes the application of sophisticated methodologies for evaluation of cosmeceuticals and emphasizes the importance of utilizing advance techniques to evaluate safety of cosmetics and cosmeceuticals.
	PHB711	
49.	Pharmacy Elective Complementary and Alternative Medicines	This course is designed to provide students with a comprehensive understanding of various non-conventional medical practices, their historical background, and their potential applications in modern healthcare. The course aims to equip students with the knowledge required to critically evaluate the safety, efficacy, and ethical considerations of complementary and alternative medicine (CAM) practices.

	PHB721	
50.	Pharmacy Elective Clinical Nutrition	<p>Clinical Nutrition for the Pharmacy Program is a specialized course tailored to equip pharmacy students with comprehensive understanding and practical skills in the realm of nutrition within healthcare and pharmacy practice. Combining theoretical foundations with real-world applications, students investigate the pivotal role of nutrition in health promotion, disease prevention, and management across various medical conditions. Fundamental principles encompass macronutrients, micronutrients, dietary guidelines, and recommended dietary allowances (RDAs), alongside techniques for assessing nutritional status in patients, catering to diverse demographic groups from infants to older adults. Emphasis is placed on nutrition's impact on chronic diseases like obesity, diabetes, cardiovascular ailments, and cancer, as well as the intricate interplay between drugs and nutrients, influencing absorption, metabolism, and therapeutic outcomes. Through medical nutrition therapy (MNT), students explore enteral and parenteral nutrition support, dietary modifications, and supplementation, while honing skills in counseling, goal setting, and fostering behavioral changes in patients. Critical appraisal of scientific literature and evidence-based practice underpins the curriculum, complemented by hands-on experiences via case studies, practical exercises, and clinical simulations. By course culmination, students emerge adept at integrating nutrition interventions into their pharmacy practice, thereby enhancing patient outcomes and healthcare delivery at large.</p>
	PHB722	
51.	Pharmacy Elective Drug Discovery from Nature	<p>The "Drug Discovery from Nature" course explores the diverse sources of natural compounds with therapeutic potential, including plants, marine organisms, and microorganisms. It covers the principles and methodologies of discovering, isolating, and developing drugs from natural sources. Students navigate the entire drug discovery process, from identifying bioactive compounds to their formulation into pharmaceutical agents. Key components include an introduction to natural products, bioprospecting, isolation techniques, pharmacological screening, bioinformatics, drug development strategies, and regulatory considerations. Practical exercises, case studies, and discussions enhance students' understanding of the complexities and opportunities in utilizing natural sources for novel therapeutic agents, aiming to equip them with the knowledge and skills to contribute to pharmaceutical exploration.</p>
	PHB712	
52.	Pharmacy Elective Vaccine formulation	<p>Vaccine Formulation is an elective course designed to provide students with specialized knowledge and skills in the formulation, development, and manufacturing of vaccines. This course will explore the fundamental principles of immunology, antigen selection, adjuvants, stabilizers, delivery systems, and regulatory considerations specific to vaccine development. Through a combination of lectures, and case studies, students will gain a comprehensive understanding of the complexities and challenges involved in vaccine formulation, preparing them for careers in pharmaceutical research, development, and regulatory affairs.</p>
	PHB713	
53.	Pharmacy Elective	

	<p>Artificial Intelligence Assisted Drug Discovery</p>	<p>The Artificial Intelligence Assisted Drug Discovery course provides a comprehensive exploration of the synergy between artificial intelligence (A.I.) and pharmaceutical research. Designed to equip students with cutting-edge skills, the course delves into AI applications, historical evolution, and challenges in drug discovery. Key components include data mining and analysis, predictive modeling, virtual screening, structural bioinformatics, deep learning, cheminformatics, ethical considerations, and industry perspectives. Through a dynamic mix of lectures, hands-on exercises, case studies, and collaborative projects, participants gain the knowledge to apply AI in addressing complex challenges within drug discovery. By course completion, students possess a nuanced understanding of AI's role in advancing pharmaceutical research, ready to contribute to this interdisciplinary field's exciting developments.</p>
	<p>PHB714</p>	