

Courses Description

College: Pharmaceutical Sciences

Department:

Course ID: 131701231 **Description:** Pharmaceutical Calculations and Compounding

Full Course Description: This course aims to teach the students legal and professional aspects of pharmaceutical compounding. It discusses the pharmacopeias, official formulations, good compounding practices, storage for dispensed products, prescription, abbreviations, labeling, and operational requirements to compound a formulation. In addition, the Pharmaceutical calculations and Pharmaceutical considerations of common compounding procedures for various formulations beginning with solution dosage forms through the dispersed system and semisolid formulations, and ending with suppositories will be discussed. □
The course will foster the ability of the student to decide the need for suitable materials to be used for the formulation of a drug substance into a stable liquid or semisolid dosage form with build-in skills in problem-solving during compounding procedures. The students will be able to critically think and appreciate the need of designing an innovative dosage form that corresponds to the new challenges. □

Course ID: 131701232 **Description:** Pharmaceutical Calculations and Compounding - Practical

Full Course Description: The pharmaceutical calculation and compounding lab focuses on several interests in the pharmaceutical field, including the fundamentals of calculations, compounding of solutions, suspensions, emulsions, semisolids, and suppositories preparations, in addition, to building up students' information regarding preparations and dispensing. □
This course aims to provide the students with good knowledge in calculations, formulation, and extemporaneous dispensing, packaging, and storage of medicines, specifically, solutions, suspensions, emulsions, creams, ointments, and gels, as well as suppositories, are discussed along with their various types, additives, methods of preparation, common examples, packaging, and quality requirements. □
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Course ID: 131701317 **Description:** Physical Pharmacy (1)

Full Course Description: This course investigates the application of physicochemical principles on problems in the pharmaceutical sciences. The impacts of physicochemical and biopharmaceutical properties of drugs on the safety, effectiveness, stability, and formulation of various pharmaceutical dosage forms are discussed thoroughly during the course. Topics of states of matter, phase equilibria, thermodynamics, solutions, ionic equilibria and buffering, solubility, and partitioning are investigated.

Course ID: 131701318 **Description:** Physical Pharmacy - Practical

Full Course Description: This course consists of practical applications of physicochemical concepts that control the behavior and processing of pharmaceutical materials, such as the drug diffusion across membranes, increasing the solubility of the drug by different approaches, the partitioning of drugs between immiscible solvents, phase equilibria, and viscosity.

Course ID: 131701333 **Description:** Physical Pharmacy (2)

Full Course Description: This course addresses the basic physicochemical principles that determine the behavior of pharmaceutical materials in different physical and biological systems related to drug formulation and delivery. Diffusion, drug release and dissolution, chemical kinetics and stability, colloidal and coarse dispersions, interfacial phenomena, rheology, and complexation are thoroughly discussed.

Course ID: 131701334 **Description:** Sterilization and Aseptic Manufacturing

Full Course Description: This course builds up on the information that the student gain in the Pharmaceutical Microbiology course. It discusses the most important features the pharmacists need to know in the area of contamination, sterilization, and infection control, as well as the manufacture of microbiologically sterile medicines (mainly parenterals and ophthalmics) and their subsequent protection against microbial contamination and spoilage. Clean room classifications and entry requirements are also introduced.

Courses Description

College: Pharmaceutical Sciences

Department:

Course ID: 131701335 **Description:** Ethics and Pharmaceutical Legislation

Full Course Description: This course introduces the students to existing laws and regulations governing the practice of Pharmacy in Jordan. In addition, the course discusses the code of ethics in pharmacy and helps the student distinguish ethics from other kinds of issues in pharmacy, and identifies options open to a pharmacist faced with an ethical issue. Several ethical dilemmas as well as case studies are presented and discussed. Guests from the Jordan Food and Drug Administration as well as Jordan Pharmacy syndicate are hosted during the course to introduce various regulatory topics to the students.

Course ID: 131701341 **Description:** Pharmaceutical Microbiology-Practical

Full Course Description: This course aims to provide students with practical skills to identify microorganisms. Prepare growth media, prepare stained smears, and differential staining specifying the gram staining. Determine the effectiveness of some of the materials and methods used to limit the growth or kill different types of microorganisms. Study the effectiveness of various sterilization techniques and introduce students to the methods used to identify the sensitivity of microorganisms to various antibiotics.

Course ID: 131701342 **Description:** Biopharmaceutics

Full Course Description: This course introduces students to the concepts of biopharmaceutics. The students study the processes of absorption, distribution, metabolism, and excretion of drugs to improve the evaluation of drug delivery systems and the therapeutic management of patients. An increased mechanistic understanding of the physiological, physiochemical, and formulation factors that influence drugs absorption from the intestine and metabolism, distribution, and elimination will be discussed. Additionally, the relevance to the generic substitution of drugs and the regulatory aspects on the absorption, bioavailability, and bioequivalence are described

Course ID: 131701354 **Description:** Pharmaceutical Microbiology

Full Course Description: The course concerns antimicrobial agents and their clinical uses in the treatment of respiratory infections, gastrointestinal infections, CNS infections, and urogenital infections. As well, it will allow the students to understand the mechanisms of bacterial resistance and how to control this problem.

Course ID: 131701436 **Description:** Industrial Pharmacy (1)

Full Course Description: This course discusses the necessary technological concepts for processing and characterization of pharmaceutical powders (size analysis, reduction, and separation as well as mixing, powder flow, granulation, and drying). The course also covers the formulation, manufacturing and quality requirements for powders, granules, and tablets.

Course ID: 131701437 **Description:** Industrial Pharmacy (1) - Practical

Full Course Description: The experiments in this course cover pharmaceutical technologies regarding powder including, size analysis and reduction, mixing, powder flow, and granulation. The course also covers the manufacturing and quality requirements of tablet dosage forms.

Course ID: 131701438 **Description:** Non-Prescription Drugs and Parapharmaceuticals

Full Course Description: This course aims to teach students how to help patients to choose and use the drugs that are dispensed without a prescription to achieve the best patient-self-care practices. This course also aims to provide students with information on managing common healthcare problems (common cold, diarrhea, constipation). Additionally, it aims to prepare students to advise on how to use medical equipment and Parapharmaceuticals such as diabetes care devices, thermometers and blood pressure measurement devices.

Course ID: 131701471 **Description:** Industrial Pharmacy (2)

Full Course Description: This course addresses pharmaceutical manufacturing processes (Coating, clarification, and packaging) and formulation, manufacturing and quality requirements for capsules, aerosols, and modified release oral dosage forms. The course also introduces students to pharmaceutical nanotechnology and preformulation.

Courses Description

College: Pharmaceutical Sciences

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Course ID: 131701472 **Description:** Industrial Pharmacy (2) - Practical

Full Course Description: This course aims to develop qualified pharmacists in the field of the pharmaceutical industry by providing students with practical work (including processes, machinery, materials, formulation, standards, and quality requirements) concerning the covered topics.

Course ID: 131701539 **Description:** Cosmetics

Full Course Description: This course discusses the scientific aspects of skin & hair care. It describes various cosmetics and cosmeceuticals available in community pharmacies, such as moisturizers, skin cleansers, masks, sunscreens, acne, skin pigmentation, and skin aging ameliorating products. It discusses the effects of various cosmetics ingredients on skin & hair and their mode of action using data supported by scientifically researched criteria. In addition, local and international legal requirements for cosmetics registration and labelling will be discussed as well as basic principles of formulations of some cosmetics. The course offers lectures enriched with case studies and assignments.

Course ID: 131701575 **Description:** Drug Quality and Regulatory Affairs

Full Course Description: This course investigates the current international guidelines and regulatory affairs related to the quality, safety, and efficacy of pharmaceutical dosage forms. It reviews the different guidelines related to the common technical document, test procedures and acceptance criteria for new drug substances and new drug products, Impurities in new drug substances and drug products, stability testing of new drug substances and products, Good Manufacturing Practices, Scale-Up and Postapproval Changes (SUPAC) Regulations, validation of analytical procedures, product development, Quality by Design and quality risk management, and investigation of bioequivalence studies.

Course ID: 131701576 **Description:** Pharmaceutical Biotechnology

Full Course Description: This course aims to teach the students the pharmaceutical uses of some microorganisms in the manufacturing of antibiotics. In addition, the principles of molecular biology and genetic engineering, including the isolation of genes, insertion into vectors, and transformation into different hosts to be expressed. This course also teaches the various biological drugs produced by biotechnology such as insulin, hormones, vaccines, and monoclonal antibodies, and the guidelines of the FDA and EMA regarding biologicals and biosimilars.

Course ID: 131701578 **Description:** Technical Writing Skills

Full Course Description: This course raises the awareness of written communication, how to assess the readability metrics of a paragraph and basics of effective writing are all important skills that are useful and valued by employers. Topics cover students' employability and job application skills and written research and business skills.

Course ID: 131701591 **Description:** Field Training

Full Course Description: This course gives students the knowledge, skills and actual exposure required for their prospective working in pharmaceutical industrial firms. This comprises training in various departments of pharmaceutical manufacturing plants including research & development, production, quality control and assurance departments.

Course ID: 131701592 **Description:** Development and Manufacturing of Solid Dosage Forms

Full Course Description: This course gives students essential information on the formulation and production of pharmaceutical dosage forms. The covered topics include taste masking approaches, formulation and manufacture of effervescent preparations, formulation and production of different dosage forms for specific types of active ingredients including peptides and proteins, plant medicines and poorly soluble drugs. The course also addresses the formulation strategies of generic oral drug products.

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Course ID: 131701593	Description: Development and Manufacturing of Liquids and Semi-Liquid Dosage Forms
Full Course Description:	This course gives students essential information on the formulation and production of pharmaceutical dosage forms. The covered topics include taste masking approaches, formulation and manufacture of effervescent preparations, formulation and production of different dosage forms for specific types of active ingredients including peptides and proteins, plant medicines and poorly soluble drugs. The course also addresses the formulation strategies of generic oral drug products.
Course ID: 131701594	Description: Pharmaceutical Quality Control and Assurance
Full Course Description:	This course addresses the roles and responsibilities associated with Quality Assurance and Quality Control. It discusses the critical components that make up a pharmaceutical quality system (e.g. GMP, GLP, validation, investigations, audits, corrective actions and risk assessment, etc.). This course also attempts to evaluate and apply the principles of Quality Assurance and Quality Control to achieve a quality pharmaceutical operation.
Course ID: 131701595	Description: Advanced Physical Pharmacy
Full Course Description:	This course is designed to study the advanced physical concepts and methods that are applied to pharmaceutical systems and problems. A strong emphasis will be on chemical kinetics, solubility and dissolution, complexation, and interfacial phenomena.
Course ID: 131701596	Description: Selected Topics in Industrial Pharmacy
Full Course Description:	In this course, the students have to attain recent knowledge about relevant specialized topics in Industrial Pharmacy.
Course ID: 131701597	Description: Drug Discovery and Development
Full Course Description:	This course will explore the process of drug design and development, from target identification to final drug registration. It will present drug development as a process involving target selection, lead discovery using computer-based methods, and combinatorial chemistry/high-throughput screening. Safety evaluation, bioavailability, clinical trials, and the essentials of patent law will also be discussed. Along students will learn about molecular recognition, computer-aided drug design, and toxicology as applied to the development of new medicines.
Course ID: 131701598	Description: Applied Research in Industrial Pharmacy
Full Course Description:	This course aims to integrate the skills, concepts, and knowledge of industrial pharmacy into research related to this field.
Course ID: 161701590	Description: Advanced Drug Delivery Systems
Full Course Description:	The course covers the fundamentals and principles of drug delivery, the strategies and materials used in controlled drug delivery, and the evaluation and characterization of such delivery systems. The strategies and design of controlled delivery systems for various administration routes will also be discussed.
Course ID: 161701591	Description: Biological Drugs & Biosimilars
Full Course Description:	This course is concerned with biological drugs, their definition, techniques used in their production and purification, and their therapeutic applications. In addition, it discusses the definition of biosimilars and the guidelines developed by different agencies such as the European Medicines Agency (EMA), the World Health Organization (WHO) and the Food and Drug Administration (FDA), as well as the approval requirements and type of testing required for biosimilarity. In addition, this course covers topics related to innovation, patents and biologics: The road to biosimilar competition: factors in?uencing investment, Business Decisions and Marketing of Biosimilars.
Course ID: 161701592	Description: Projects Management in Pharmacy
Full Course Description:	The objective of this course is to provide students with basic knowledge of project management in relation to the pharmaceutical disciplines. Key educational aspects include: strategic planning, calculated decision making, total quality management, operations management, risk assessment, and economic management.

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Course ID: 1717011590 **Description:** Drug Development & Manufacturing

Full Course Description: This course gives students essential information on the formulation and production of pharmaceutical dosage forms. The covered topics include taste masking approaches, formulation and manufacture of effervescent preparations, formulation and production of different dosage forms for specific types of active ingredients including peptides and proteins, plant medicines and poorly soluble drugs. The course also addresses the formulation strategies of generic oral drug products.

Course ID: 1717011591 **Description:** Field Training

Full Course Description: This course gives students the knowledge, skills and actual exposure required for their prospective working in pharmaceutical industrial firms. This comprises training in various departments of pharmaceutical manufacturing plants including research & development, production, quality control and assurance departments.

Course ID: 1717011592 **Description:** Projects Management in Pharmacy

Full Course Description: The objective of this course is to provide students with basic knowledge of project management in relation to the pharmaceutical disciplines. Key educational aspects include: strategic planning, calculated decision making, total quality management, operations management, risk assessment, and economic management.

Course ID: 1717011595 **Description:** Advanced Seminar

Full Course Description: The material is no longer offered during the semester

Course ID: 1717011596 **Description:** Selected Topics in Industrial Pharmacy

Full Course Description: In this course, the students have to attain recent knowledge about relevant specialized topics in Industrial Pharmacy.

Course ID: 1717011597 **Description:** Drug Discovery and Development

Full Course Description: This course will explore the process of drug design and development, from target identification to final drug registration. It will present drug development as a process involving target selection, lead discovery using computer-based methods, and combinatorial chemistry/high-throughput screening. Safety evaluation, bioavailability, clinical trials, and the essentials of patent law will also be discussed. Along students will learn about molecular recognition, computer-aided drug design, and toxicology as applied to the development of new medicines.

Course ID: 1917011231 **Description:** Pharmaceutical Calculations and Compounding

Full Course Description: This course aims to teach the students legal and professional aspects of pharmaceutical compounding. It discusses the pharmacopeias, official formulations, good compounding practices, storage for dispensed products, prescription, abbreviations, labeling, and operational requirements to compound a formulation. In addition, the Pharmaceutical calculations and Pharmaceutical considerations of common compounding procedures for various formulations beginning with solution dosage forms through the dispersed system and semisolid formulations, and ending with suppositories will be discussed. □
The course will foster the ability of the student to decide the need for suitable materials to be used for the formulation of a drug substance into a stable liquid or semisolid dosage form with build-in skills in problem-solving during compounding procedures. The students will be able to critically think and appreciate the need of designing an innovative dosage form that corresponds to the new challenges. □

Course ID: 1917011334 **Description:** Physical Pharmacy - Practical

Full Course Description: This course consists of practical applications of physicochemical concepts that control the behavior and processing of pharmaceutical materials, such as the drug diffusion across membranes, increasing the solubility of the drug by different approaches, the partitioning of drugs between immiscible solvents, phase equilibria, and viscosity.

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College: Pharmaceutical Sciences

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Course ID: 1917011461 **Description:** Ethics and Pharmaceutical Legistlation

Full Course Description: This course introduces the students to existing laws and regulations governing the practice of Pharmacy in Jordan. In addition, the course discusses the code of ethics in pharmacy and helps the student distinguish ethics from other kinds of issues in pharmacy, and identifies options open to a pharmacist faced with an ethical issue. Several ethical dilemmas as well as case studies are presented and discussed. Guests from the Jordan Food and Drug Administration as well as Jordan Pharmacy syndicate are hosted during the course to introduce various regulatory topics to the students.

Course ID: 1917011559 **Description:** Advanced Drug Delivery Systems

Full Course Description: The course covers the fundamentals and principles of drug delivery, the strategies and materials used in controlled drug delivery, and the evaluation and characterization of such delivery systems. The strategies and design of controlled delivery systems for various administration routes will also be discussed.

Course ID: 1917011575 **Description:** Pharmaceutical Quality Control and Regulatory Affairs

Full Course Description: This course investigates the current international guidelines and regulatory affairs related to the quality, safety, and efficacy of pharmaceutical dosage forms. It reviews the different guidelines related to the common technical document, test procedures and acceptance criteria for new drug substances and new drug products, Impurities in new drug substances and drug products, stability testing of new drug substances and products, Good Manufacturing Practices, Scale-Up and Postapproval Changes (SUPAC) Regulations, validation of analytical procedures, product development, Quality by Design and quality risk management, and investigation of bioequivalence studies.

Course ID: 2217011571 **Description:** Hair and Body Care Products

Full Course Description:

Course ID: 2217011572 **Description:** Special Topics in Cosmotic Science

Full Course Description: This course is a continuation for Cosmetic Science Course. Various cosmetic science special topics will be discussed including: Hair care products formulation, mechanism of action as well as customer counselling, sunscreen legislations worldwide, skin care products and customer counselling for rosacea and various skin conditions. Laser Hair removal as well as various up-to-date research published articles in cosmetic science will be discussed. The course will include field trips to local cosmetic companies.

Course ID: 2217011573 **Description:** Applied Research in Industrial Pharmacy and Cosmotics

Full Course Description: The course is new within the new plan and has not been presented yet□

Course ID: 2317011573 **Description:** Specialized field training in cosmetic pharmacy

Full Course Description:

Course ID: 131702221 **Description:** Biochemistry

Full Course Description: This course aims to provide the students with the basic information about the physical and chemical properties for macromolecules (carbohydrate, lipids and proteins) and their function in the biological system. The metabolism of carbohydrate, proteins, triglycerides, cholesterol and phospholipids will also be studied. In addition, it concerns with explanation of energy production and oxidative phosphorylation reactions.

Course ID: 131702222 **Description:** Biochemistry - Practical

Full Course Description: This course aims to discuss the practical application of the basic methods used in the laboratory identification of sugars, proteins, and lipids. in addition to their methods of analysis in vitro and in biological specimens such as blood and urine and to study different enzymatic reactions and their analysis methods and applications. Gel electrophoresis (SDS-PAGE) for protein isolation is also studied.□

Courses Description

College: Pharmaceutical Sciences

Department:

Course ID: 131702251 **Description:** Anatomy and Histology

Full Course Description: Anatomy and Histology are two essential basic medical courses. Histology is the science that studies normal microscopic structures, ultra-structures and their related function; whereas, Anatomy studies the gross appearance of the various organs that make up the systems of the human body. Through class lecture, the students will be made to master the basic knowledge of the morphology and relations of the anatomical structures that are present in humans and the histological tissues that form these structures. The relation between the type of tissue present in an organ and the shape and functions of that organ is stressed.

Course ID: 131702252 **Description:** Physiology

Full Course Description: The course is a lecture based one. Physiology is discussed in systemic approach. Each unit of the human body will be discussed from both structural and functional basis. □
This course is designed to provide students with an understanding of the function & regulation of the human body and physiological integration of the organ systems to maintain homeostasis. Course content will include neural & hormonal homeostatic control mechanisms, as well as study of the musculoskeletal, circulatory, respiratory, digestive, urinary, immune, reproductive, and endocrine organ systems. □
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Course ID: 131702253 **Description:** Pathology

Full Course Description: This course aims to introduce the basic terminology, concepts, aetiologies and characteristics of altered function, causes and complications of many diseases including cardiovascular, gastrointestinal, respiratory, liver and renal diseases. In addition to pain pathogenesis. Furthermore, the course discusses the pathogenesis of inflammation and cancer.

Course ID: 131702343 **Description:** Pharmacokinetics

Full Course Description: This course focuses on basic pharmacokinetic principles, discusses time concentration curve, and aims at teaching students how to calculate drug levels in blood and in urine after various administrations (IV bolus, IV infusion, oral, single dosing and multiple dosing) by solving various practice problems.

Course ID: 131702355 **Description:** Pathophysiology

Full Course Description: This course aims to introduce the basic terminology, concepts, aetiologies and characteristics of altered function, causes and complications of many diseases including cardiovascular, gastrointestinal, respiratory, liver and renal diseases. In addition to pain pathogenesis. Furthermore, the course discusses the pathogenesis of inflammation and cancer.

Course ID: 131702361 **Description:** Pharmacology (1)

Full Course Description: Pharmacology is the study of drugs. This course will cover a brief introduction about pharmacology, pharmacokinetics, pharmacodynamics and receptors. Moreover, this course provides the students with the pharmacology of the drugs working on the autonomic nervous system (ANS), cardiovascular (CV) system and drugs used in dyslipidemia, anemia and coagulation diseases regarding their mechanism of action, biotransformation, side effects, contraindications and their clinical uses.

Course ID: 131702362 **Description:** Pharmacology (2)

Full Course Description: Pharmacology is the study of drugs. Pharmacology II course deals with the action, mechanism of action, biotransformation, side effects, clinical uses, and contraindications of: drugs used in Asthma, autocooids, nonsteroidal anti-inflammatory drugs, disease modifying antirheumatic drugs, drugs used in gout as well as endocrine drugs and drugs act in the CNS.

Courses Description

College: Pharmaceutical Sciences

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Course ID: 131702368 **Description:** Community Pharmacy (1)

Full Course Description: This course is the first part of the college's experiential training program. It aims at training students in community pharmacies or other pharmaceutical institutions as deemed appropriate under the supervision of faculty members where they will be evaluated at the end of the course.

Course ID: 131702426 **Description:** Clinical Biochemistry

Full Course Description: The course covers electrolyte hemostasis, acid-base balance tests, kidney function tests, liver function tests, glucose metabolism disorders, calcium and magnesium hemostasis, proteins and amino acid disorders, hematology and hemoglobin disorders, lipid profile and thyroid glands disorders.

Course ID: 131702456 **Description:** Toxicology

Full Course Description: This course introduces the students to the fundamentals of toxicology, at both molecular and clinical aspects. It also introduces the general concepts behind poison treatments. The course starts with introducing the student to toxicological terms such as LD50. Then, it moves to describing animal toxicological studies and dose-response curves with a focus on acute and chronic intoxications. Afterwards, the basic pharmacokinetics of toxicants is described such as absorption, metabolism, distribution and elimination, with great emphasis on the last aspect as a mechanism of detoxification. □

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Part of the course focuses on famous toxicants such as cyanide and carbon monoxide toxicities and their clinical treatment strategies. By the end of the week, every student will present a case study of a drug that caused significant toxicity and how this was managed pharmacologically and clinically. □

Course ID: 131702457 **Description:** Communication Skills and Pharmaceutical Care

Full Course Description: This course aims to teach essential daily communication skills, best conflict management practices, best ethical practices, and best pharmacist-patient communication practices within the society. It aims to teach students the optimum healthcare communication skills especially within a pharmacy; how to best communicate with the elderly and people with special needs to ensure the best specialized pharmaceutical services. It provides students with basic concepts on public health, the role of the pharmacy in the community and the role of the pharmacist in promoting public health.

Course ID: 131702458 **Description:** Immunology and Vaccines

Full Course Description: This course focuses on the study of the immune system of humans that has evolved to protect against infection by pathogens. The course will provide a basic understanding of human immunology and its relationship to health and disease. Immunology overlaps with many other biological disciplines including biochemistry, molecular biology, cell biology, genetics, physiology, and microbiology, it relies on methods and concepts derived from these disciplines and in turn makes a major contribution to them. This course aims to teach basic immunology and its role in disease and treatment. It also includes a section on vaccine types and their mechanism of action and a section on pharmacogenomics and drug response based on genetic differences.

Courses Description

College: Pharmaceutical Sciences

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Course ID: 131702463 **Description:** Pharmacology (3)

Full Course Description: This course provides students the knowledge of mechanism of action, pharmacokinetics, clinically significant side effects & drug interactions, contraindications and clinical uses of antimicrobials, anticancer drugs, immunotherapy and medications used for gastrointestinal disorders. In addition, this course will introduce the students on pathophysiology and clinical manifestations of some diseases. Thereby, they will understand the goal of pharmacotherapy, patient education of selected medications □
Some of the drugs that will be mentioned include: □
Drugs that have antibacterial, antiviral, antifungal and antiprotozoal activity as well as ones used to treat cancer. □
Drugs for gastrointestinal disorders including peptic ulcer, vomiting, diarrhea and constipation. □
Drugs that act or manipulate on the immune system and the immune response respectively.

Course ID: 131702464 **Description:** Pharmacotherapy (1)

Full Course Description: This course teaches pharmacy students how to integrate their background in biomedical and pharmaceutical sciences with pharmacotherapy to make reasonable judgment and decisions about patients' care in a patient-centered and team-based approach. It helps students to develop and refine their skills in critical thinking and problem-solving to identify and manage medication-related problems for safe, appropriate and cost-effective drug therapy regimens that respect the choice of the patient and enhance adherence. These skills promote students' self-confidence and self-learning and allow them to appreciate the vital role of pharmacists as key healthcare providers for optimal outcomes of patients' health in preparation for the students' professional practice. □
Topics that are covered here include cardiovascular, endocrinologic and respiratory disorders, and other miscellaneous topics. These topics will be discussed based on the knowledge of the pathophysiology, diagnosis, clinical manifestations, risk factors, complications, goals of therapy, and treatment guidelines. □

Course ID: 131702465 **Description:** Pharmacotherapy Case Studies (1)

Full Course Description: This course discusses patient case studies related to the topics covered in pharmacotherapy 1. It aims to help pharmacy students develop their critical thinking and problem-solving skills to identify and resolve drug therapy problems. By practicing developing patients' pharmacotherapeutic care plans for the patient case studies, students are actively engaged in the learning process, and developing their self-confidence, self-study and learning, decision-making process, oral communication and teamwork. □

Course ID: 131702469 **Description:** Community Pharmacy (2)

Full Course Description: This course helps pharmacy students identify and understand the role of pharmacists in the community and the hospital at practice sits. In this experiential training program, students will spend most of their class and learning time (at least 224 hours) in the practice environment interacting and communicating with pharmacists, technicians, peers, other healthcare providers, and patients. Students will develop their skills to integrate their basic pharmaceutical and medical knowledge and apply it into patient care particularly, in the outpatient setting. It also offers the students to acquire an understanding of their role in the pharmaceutical care of hospitalized patients with an appreciation of some important hospital-related medications. In addition, students will have the opportunity to enhance their communication and interpersonal skills to promote constructive relationships with patients and co-workers including healthcare professionals and develop professional attitude.

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College: Pharmaceutical Sciences

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Course ID: 131702473 **Description:** Pharmaceutical Marketing and Management

Full Course Description: This course is designed to introduce students to the theory and practice of the management and marketing sciences in the pharmacy profession. The purpose of this course is to provide students with the necessary skills relating to the management of health care products and services. Furthermore, this course will focus on the fundamental principles of marketing and selling of pharmaceutical products by providing students with a broad understanding of the different consumer and health care provider's behavior. Students will be given the opportunity to apply the relevant theories to practical marketing issues through encouraging students to conduct role-plays; produce written work and collaborate with peers on set tasks or projects.

Course ID: 131702474 **Description:** Phytotherapy

Full Course Description: This course aims to introduce the student to the phytochemical and natural drugs that has been registered internationally and nationally, in addition, the student will be introduced to the medicinal plants used to treat various disorders such as the disorders related to the GI tract, the nervous system, the cardiovascular system the autonomic system, the skin and the endocrine system. This course will emphasize on the duration of drug use, drug-drug interactions and side effects related to the use of the medicinal plants. In addition to that the student will learn more about the use of hallucinogenic plants, their toxicity and side effects related to these plants with emphasis on the plants that habitat in the Jordanian environment. □
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Course ID: 131702544 **Description:** Pharmaceutical Statistics

Full Course Description: Introduces students to the most important concepts in pharmaceutical statistics which help undergraduate students to acquire knowledges in different important topics with the purpose of improving the students' statistical knowledge to use the proper methods to collect the data, employ the correct analyses, and effectively present the results, as well as to make decisions based on data, and make predictions in different aspects of pharmaceutical researches. Topics include understanding types of data encountered in pharmaceutical studies and their appropriate graphical presentation, other statistical tools for describing central tendency and dispersion of data; probability concepts; statistical hypothesis testing and its application to group comparisons; and epidemiology concepts.

Course ID: 131702545 **Description:** Pharmacoeconomics

Full Course Description: This course will discuss the concepts and applications of Pharmacoeconomics. Moreover, studying different Pharmacoeconomic evaluation methods to identify, measure and compare the costs, risks and benefits of therapies and determining which alternative produces the best health outcome for the resource invested. In addition to provide students with decision making skills based on different pharmacoeconomic evaluation methods. Furthermore, provide the students with the ability to criticize published Pharmacoeconomics studies and its suitability for Jordan.

Courses Description

College: Pharmaceutical Sciences

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Course ID: 131702566 **Description:** Pharmacotherapy (2)

Full Course Description: This course teaches senior pharmacy students how to integrate their background in biomedical and pharmaceutical sciences with pharmacotherapy to make reasonable judgment and decisions about patients' care in a patient-centered and team-based approach. It helps students to develop and refine their skills in critical thinking and problem-solving to identify and manage medication-related problems for safe, appropriate and cost-effective drug therapy regimens that respect the choice of the patient and enhance adherence. These skills promote students' self-confidence and self-learning and allow them to appreciate the vital role of pharmacists as key healthcare providers for optimal outcomes of patients' health in preparation for the students' professional practice. □
Topics that are covered here include infectious diseases, gastrointestinal disorders, anemia, rheumatologic disorders, and other miscellaneous topics. These topics will be discussed based on the knowledge of the pathophysiology, diagnosis, clinical manifestations, risk factors, complications, goals of therapy, and treatment guidelines. □

Course ID: 131702567 **Description:** Pharmacotherapy Case Studies (2)

Full Course Description: This course discusses patient case studies related to the topics covered in pharmacotherapy 2. It aims to help pharmacy students develop their critical thinking and problem-solving skills to identify and resolve drug therapy problems. By practicing developing patients' pharmacotherapeutic care plans for the patient case studies, students are actively engaged in the learning process, and developing their self-confidence, self-study and learning, decision-making process, oral communication and teamwork.

Course ID: 131702577 **Description:** Drug Informatics

Full Course Description: This 1 credit hours course introduces students to the increasing importance of drug information. Provides students with skill and ability to obtain, manage, evaluate, and use information across different settings (i.e. community pharmacy, hospitals, pharmaceutical companies and educational institutions) and various levels (i.e. general resources and specific case oriented resources). Furthermore, this course aims to encourage students to lead innovations and attempts to support National Jordanian Health Information Care Systems for building better applications, similar to informatics systems in U.K., USA., and other developed countries.

Course ID: 131702581 **Description:** Field Training

Full Course Description: This course aims to train students on-site in one of the predetermined pharmaceutical institutions under the supervision of a faculty member. The student will be evaluated at the end of the training period. □
The course outline has detailed clarification of the intended learning outcomes. Training will be in the following main departments: Sales and medical representative visits, Awareness and public relations department, Human resources department, Financial department, Supply Chain department, Medical department, Compliance - Pharmacovigilance department and Registration department. □

Course ID: 131702582 **Description:** Business Principles

Full Course Description: This course explores the topic of management in terms of current management concepts, trends and practices and the historical foundations and development of management thought. The course introduces the student to many management concepts such as: organizations, managers and their levels, types, roles and skills, organizational and managerial performance, performance effectiveness and efficiency, the external and internal environment, competitive advantage, environmental uncertainty and complexity, business sustainability and innovation while highlighting and exploring the four main management functions (i.e. planning, organizing, leading and controlling)

Courses Description

College: Pharmaceutical Sciences

Department:

Course ID: 131702583 **Description:** Advanced Marketing and Promotion

Full Course Description: Students in the previous course (Management and Marketing course) had been introduced to the main concepts of management and marketing, how they are affecting each other, the importance of the planning process. Managerial skills in marketing and other pharmaceutical functions, wherein advanced pharmaceutical marketing the course will focus on practice tips to answer questions as How do the pharmaceutical marketing companies function? what is the role of the sales force? what is the job description of the medical sales representative? How do medical reps manage their areas and territories during their job?

Course ID: 131702584 **Description:** Pharmaceutical Epidemiology

Full Course Description: Students must acquire knowledge to: explain the nature and use of pharmacoepidemiology; recognize and apply the terms associated with the pharmacoepidemiology; calculating measures of morbidity and mortality; compare without bias measures of morbidity and mortality for various populations; enumerate and evaluate the designs of pharmacoepidemiological studies; discuss limitations of methods for collecting pharmacoepidemiological data; calculate measures of association and impact between risk factors and the onset of disease; evaluating diagnostic tests. It is intended that students develop research skills, information gathering and critical analysis of the scientific literature. They should also develop the necessary recognition of the major research methodologies in Epidemiology and Public Health skills and understand the importance of research in the prevention and control of health events in populations.

Course ID: 131702585 **Description:** Health Policy

Full Course Description: This course presents an introduction to health policy, i.e., the various ways in which the government plays a role in health and in the provision of health care. Health policies can have a profound effect on quality of life. Accessibility, cost, quality of health care; safety of drugs; the right to make decisions about our health; these issues are vitally tied to health policies. This course provides a framework for understanding the social, political and economic dimensions of health policy. It introduces the policy-making and legal system, offers brief comparisons to health policies in certain other countries, provides knowledge about the organization of the health care system ., and highlights issues in health policy including pharmaceutical policy, Students will learn to think systematically about these issues and the various methods available to public and private policymakers to solve them, specifically pharmaceutical health policy.

Course ID: 131702586 **Description:** Research Methods in Drug Policy

Full Course Description: This course aims to train students on the scientific methods for pharmacy research, policy setting, methods of sampling and data analysis. □
□
The aim of this course is to provide students with advanced knowledge related to research designs, type of studies and specific terms in statistics. Moreover, the course will provide an overview of the tools to assess pharmaceutical care policies in a given country. Finally, common theories in Pharmaceutical care policies shall be illustrated.□

Course ID: 131702587 **Description:** Selected Topics in Pharmacy Management

Full Course Description: It is an advanced course in the pharmacy management discipline. Specialized selected skills and topics will be presented: such as electronic management and electronic marketing, leadership and its applications, entrepreneurship and innovation and their evaluation tools, coaching skills and team formation, promotion and performance appraisal skills, and crisis management skills. Other topics will be considered based on demands, developments and requirements of the labour market and pharmaceutical practice.

Courses Description

College: Pharmaceutical Sciences

Department:

Couse ID: 131702588 **Description:** Applied Research in Management Pharmacy

Full Course Description: It is an advanced course in research. This course will review research types, study designs. Moreover, indicators of critical appraisal will be reviewed and statistical models accompanying each type of research. This course deals with a number of research topics in pharmaceutical and administrative practice, such as: adherence to medication, measures of health-related quality of life, tools for the economic evaluation of treatment plans, types of patients' beliefs, types of patients' behaviors and methods to change it, indicators to assess the success of therapeutic care programs, methods in medication optimization and medicines review. This course will also have topics for research in types of pharmaceutical marketing and selling models, patterns of promotion and health awareness. Finally, the course will be updated based on demands from the labour market or literature recommendations.

Couse ID: 1717021580 **Description:** Pharmaceutical Finance

Full Course Description: This Course covers the basics of financial analysis, including the time value of money, simple and compound interest, using comparative financial statements, trend analysis, and ratio analysis. Through comparative financial statement analysis, it describes how the pharmacy students can apply financial information to create usable metrics to assess the internal business performance.□

□
These analyses can then be used to determine the necessary resource allocation for staffing, inventory, and investment, as well as the overall current and future business direction. In addition a case study will be held to apply the previous knowledge.□

□
Subsequently, shows how pharmacy students can use the financial information from pharmacy businesses, along with knowledge of the marketplace and customer needs, to appropriately control the inventory of a pharmacy operation. Proper inventory control can result in optimal levels that keep inventory costs to a minimum while at the same time ensuring customer/ patient satisfaction.□

Couse ID: 1717021589 **Description:** Pharmaceutical Accounting

Full Course Description: This course consists of understanding the guiding principles of accounting and how individual business transactions are summarized in financial statements and reports. This basic understanding should allow pharmacy students to determine the source and flow of financial information within any pharmacy and form a knowledge base of how their financial information should be categorized, recorded, and then reviewed. In addition to lectures, A case study workshop will be held to apply the previous knowledge.□

□
Withal, the importance of financial statements in analyzing a company's economic activity is discussed as well as a review of the various users and types of financial statements used to determine the success or failure of a pharmacy business over a specified time period, and how their analysis affects the current and future business direction.□

□

Courses Description

College: Pharmaceutical Sciences

Department:

Course ID: 1917021241 **Description:** Pharmaceutical Statistics

Full Course Description: Introduces students to the most important concepts in pharmaceutical statistics which help undergraduate students to acquire knowledges in different important topics with the purpose of improving the students' statistical knowledge to use the proper methods to collect the data, employ the correct analyses, and effectively present the results, as well as to make decisions based on data, and make predictions in different aspects of pharmaceutical researches. Topics include understanding types of data encountered in pharmaceutical studies and their appropriate graphical presentation, other statistical tools for describing central tendency and dispersion of data; probability concepts; statistical hypothesis testing and its application to group comparisons; and epidemiology concepts.

Course ID: 1917021251 **Description:** Anatomy and Histology

Full Course Description: Anatomy and Histology are two essential basic medical courses. Histology is the science that studies normal microscopic structures, ultra-structures and their related function; whereas, Anatomy studies the gross appearance of the various organs that make up the systems of the human body. Through class lecture, the students will be made to master the basic knowledge of the morphology and relations of the anatomical structures that are present in humans and the histological tissues that form these structures. The relation between the type of tissue present in an organ and the shape and functions of that organ is stressed.

Course ID: 1917021253 **Description:** Pathophysiology

Full Course Description: This course aims to introduce the basic terminology, concepts, aetiologies and characteristics of altered function, causes and complications of many diseases including cardiovascular, gastrointestinal, respiratory, liver and renal diseases. In addition to pain pathogenesis. Furthermore, the course discusses the pathogenesis of inflammation and cancer.

Course ID: 1917021343 **Description:** Pharmacokinetics

Full Course Description: This course focuses on basic pharmacokinetic principles, discusses time concentration curve, and aims at teaching students how to calculate drug levels in blood and in urine after various administrations (IV bolus, IV infusion, oral, single dosing and multiple dosing) by solving various practice problems.

Course ID: 1917021463 **Description:** Pharmacology (3)

Full Course Description: This course provides students the knowledge of mechanism of action, pharmacokinetics, clinically significant side effects & drug interactions, contraindications and clinical uses of antimicrobials, anticancer drugs, immunotherapy and medications used for gastrointestinal disorders. In addition, this course will introduce the students on pathophysiology and clinical manifestations of some diseases. Thereby, they will understand the goal of pharmacotherapy, patient education of selected medications □
Some of the drugs that will be mentioned include: □
Drugs that have antibacterial, antiviral, antifungal and antiprotozoal activity as well as ones used to treat cancer. □
Drugs for gastrointestinal disorders including peptic ulcer, vomiting, diarrhea and constipation. □
Drugs that act or manipulate on the immune system and the immune response respectively.

Courses Description

College: Pharmaceutical Sciences

Department:

Course ID: 1917021567 **Description:** Hospital Pharmacy

Full Course Description: The course provides students with the knowledge and understanding of the responsibilities of the hospital pharmacist. It discusses several relevant topics to the hospital pharmacy practice in order to ensure adequate and appropriate healthcare to patients and support to healthcare professionals. It also focuses on developing and enhancing the student's effective communication skills with all parties involved in the hospital pharmacy practice. Students will be offered a learning experience about hospital pharmacy practice through visits to regional hospitals and/or hospital pharmacy simulations at the Faculty of Pharmaceutical Sciences.□

Topics include hospital pharmacy organization, laws and regulations of hospital pharmacy practice, pharmacy and therapeutic committee, safe use of medications in the hospital, crash cart medications, specialisation in pharmacy practice, preparing and administering parenteral medications, and communication skills (nonverbal communication, barriers to communication, ethical patient care, assertiveness).□

Course ID: 1917021577 **Description:** Drug Informatics

Full Course Description: This 1 credit hours course introduces students to the increasing importance of drug information. Provides students with skill and ability to obtain, manage, evaluate, and use information across different settings (i.e. community pharmacy, hospitals, pharmaceutical companies and educational institutions) and various levels (i.e. general resources and specific case oriented resources). Furthermore, this course aims to encourage students to lead innovations and attempts to support National Jordanian Health Information Care Systems for building better applications, similar to informatics systems in U.K., USA., and other developed countries.

Course ID: 1917021583 **Description:** Advanced Pharmaceutical Marketing and Promotion

Full Course Description: Students in the previous course (Management and Marketing course) had been introduced to the main concepts of management and marketing, how they are affecting each other, the importance of the planning process. Managerial skills in marketing and other pharmaceutical functions, wherein advanced pharmaceutical marketing the course will focus on practice tips to answer questions as How do the pharmaceutical marketing companies function? what is the role of the sales force? what is the job description of the medical sales representative? How do medical reps manage their areas and territories during their job?

Course ID: 2117021250 **Description:** Pharmacology for Nursing

Full Course Description: This course focuses on the basic principles of pharmacology, methods of administration of the most common used drugs. It emphasizes on drugs' classes and their therapeutic uses to treat body disorders in common body systems (cardiovascular, blood, gastrointestinal, endocrine systems and central nervous systems).

Course ID: 2117021251 **Description:** Pharmacology for Applied Health Sciences

Full Course Description: This course helps nursing students identifies and understands the basics of pharmacology which is relevant to students from applied health sciences backgrounds. This course focuses on the basic principles of pharmacology, methods of administration of the most common used drugs, drug properties including pharmacokinetic and pharmacodynamic processes and on understanding the role of nerve pathways in exerting drug's action. It emphasizes on drugs' classes and their therapeutic uses to treat body disorders in common body systems (cardiovascular, blood, gastrointestinal, endocrine and nervous systems). In addition, this course provides the basic knowledge about the antimicrobial agents' mechanisms of action to treat infectious diseases. Dietary supplements and herbal medications also will be covered as well as topics related to Laboratory test-drug interactions and Drug -Food Interactions.

Course ID: 2217021561 **Description:** Advanced OTC and Medical Devices

Full Course Description: The course is new within the new plan and has not been presented yet□

Courses Description

College: Pharmaceutical Sciences

Department:

Course ID: 2217021562 **Description:** Case Studies in Community Pharmacy

Full Course Description: This course equips future community pharmacists with the necessary training to implement patient care services in a dynamic and challenging environment. This is achieved by community pharmacy practice case scenarios and MyDispense community pharmacy simulation program exercises to manage medications and diseases, educate patients and customers and safely dispense medications.

Course ID: 2217021563 **Description:** Applied Research in Community Pharmacy

Full Course Description: This course aims to provide an opportunity for pharmacy students to engage with pharmacy practice research in community pharmacy fields and enhance their skills in developing public health awareness programs and pharmaceutical care services within community pharmacies. In addition, this course will introduce the concept of Good Pharmacy Practice (GPP) to help pharmacy students in enhancing the pharmacy profession in the future.

Course ID: 2217021581 **Description:** Supply Chain and Operation Management

Full Course Description: The course is new within the new plan and has not been presented yet□

Course ID: 2217021582 **Description:** Topics in Managerial Finance in Community Pharmacy

Full Course Description: This course is specialized to community pharmacy financing. It consists of understanding the guiding principles of accounting and how pharmacy transactions are summarized in financial statements and reports. This basic understanding should allow pharmacy students to determine the source and flow of financial information within any pharmacy and form a knowledge base of how their financial information should be categorized, recorded, and then reviewed. Furthermore the basics of financial analysis, including the time value of money, simple and compound interest, using comparative financial statements, trend analysis, and ratio analysis. Through comparative financial statement analysis, it describes how the pharmacy students can apply financial information to create useful metrics to assess the internal business performance. These analyses can then be used to determine the necessary resource allocation for staffing, inventory, and investment, as well as the overall current and future business direction. In addition a case study will be held to apply the previous knowledge.

Course ID: 131703211 **Description:** Pharmaceutical Organic Chemistry

Full Course Description: The course is planned to cover knowledge of organic chemistry with particular emphasis on heterocyclic organic compounds including their nomenclature, natural sources, and methods of synthesis. It covers the chemistry of different classes of heterocyclic and polycyclic aromatic compounds involving one or more heteroatoms with focusing on their medical and pharmaceutical importance. Additionally, the course will confer the stereo-chemical aspects of these systems focusing on their effect on drugs activities.□

Course ID: 131703212 **Description:** Pharmaceutical Organic Chemistry - Practical

Full Course Description: This course is created to cover practical applications of various methods and techniques used for the identification of functional groups of organic compounds of pharmaceutical interest, giving more attention to chemical identification. The laboratory includes two parts; the first part includes the various separation and purification techniques of organic compounds such as crystallization, distillation, extraction, and chromatography. The second part concentrates on the identification of functional groups of organic compounds of pharmaceutical interest, giving more attention to chemical identification.

Course ID: 131703313 **Description:** Pharmacognosy and Phytochemistry

Full Course Description: Study of basic information on pharmacognosy and medicinal plants regarding classification and identification of their components. Providing information on different naturally occurring secondary metabolites. The course will emphasize the chemical, biological and therapeutic activities of these compounds and the different constituents used in the pharmaceutical industry.

Courses Description

College: Pharmaceutical Sciences

Department:

Course ID: 131703314 **Description:** Pharmacognosy and Phytochemistry - Practical

Full Course Description: Understanding the definition and material of pharmacognosy science and its applications in therapy and pharmacy, acquainting knowledge of natural drug products, their classification, production, evaluation as well as their general chemistry, and understanding the qualitative and quantitative tests used to evaluate plant material in its crude and powdered status according to pharmacopeia and WHO guidelines for plant-based material. □
In addition, this practical course intends to acquaint students with the required practical skills of natural product analysis including herbal sample preparation (drying and grinding), extraction, separation (chromatography; TLC), and characterization. The applications covered include some selected medicinal herbs and their extractives that are rich in various phytochemical groups of primary and secondary metabolism such as sugars, fixed and volatile oils, alkaloids, phenols, terpenoids, etc., particularly covered by the theoretical courses Photochemistry. □

Course ID: 131703315 **Description:** Pharmaceutical Instrumental Analysis

Full Course Description: The course is designed to give the pharmacy student an overview of the various modern instrumental analytical technique used in pharmaceutical analysis. The requirements for instrumentation including the precision, accuracy, sensitivity, selectivity, detection limit, and dynamic range will be discussed during this course. Students will be taught how to identify the chemical structure from the complementary information afforded by four types of spectra: UV, IR, NMR, and MS. Additionally, the introduction to the chromatographic theory, separation techniques, and applications concerned HPLC and GC.

Course ID: 131703316 **Description:** Pharmaceutical Instrumental Analysis - Practical

Full Course Description: This course is designed to cover the practice of instrumental analysis as applied to the identification and quantitation of analytes in samples typically encountered in chemical and pharmaceutical industries. Course emphasis will be placed on Potentiometric titration, UV-Visible spectroscopy qualitative analysis, Infrared, Solid-phase extraction, High-performance liquid chromatography, and Gas chromatography. These methods are used in the lab along with other analytical procedures in applications for the analysis of pharmaceutical preparations.

Course ID: 131703323 **Description:** Medicinal Chemistry (1)

Full Course Description: This course explains the effects of a drug's structure and physicochemical properties on pharmacokinetics ADME (Absorption, Distribution, Metabolism and Excretion), pharmacodynamics (reaction of drug with its receptor), and drug metabolism (phase I (oxidative, reductive, and hydrolytic biotransformation) and phase II (conjugation). Prodrugs also will be discussed. In addition, the structure activity relationship of the different drug classes including autonomic nervous system, cardiovascular system, antiasthmatic and antiallergic drugs, drugs used in gastric ulcer and hormone therapy and the effect of chemical modification on the efficacy and the physicochemical properties of these groups of compounds.

Course ID: 131703424 **Description:** Medicinal Chemistry (2)

Full Course Description: In this course, the knowledge from prerequisite course will be applied. Recognize the relation between molecules for design of certain synthetic leads. The categories of drug classes and their efficacies including antibiotics, antibacterial, antiviral, antifungal, anthelmintic, central nervous system drugs (antipsychotic, antiepileptic, sedative-hypnotics, anxiolytic, antidepressants and CNS stimulants), antidiabetic drugs, analgesics (opoid and non-opoid) anticancer, will be identified.

Courses Description

College: Pharmaceutical Sciences

Department:

Course ID: 131703425 **Description:** Medicinal Chemistry -Practical

Full Course Description: This practical course in medicinal chemistry concerned with multistep synthesis of selected medicinal compounds. The successful medicinal chemist is an expert organic chemist who has, or can acquire, sufficient knowledge in other disciplines to apply that knowledge to drug synthesis and design. We shall have opportunities to illustrate the dependence of medicinal chemistry on knowledge from other disciplines as we progress through this course. So our course will build on the experience gained from organic chemistry lab through the synthesis and characterization of complex molecules, the acquisition and interpretation of physical data and the investigation of chemical systems through computational techniques gained in analytical and instrumental labs. It consists of a series of laboratory-based experiments aimed at developing skills in the synthesis, safe handling and analysis of chemical substances of a range of different classes of compounds; an understanding of modern characterization techniques (e.g. chromatography, atomic and molecular spectroscopy), and the operation of instrumentation for the acquisition of kinetic, structural and thermodynamic data.

Course ID: 161703590 **Description:** Spectroscopic Methods Applications in Pharmacy

Full Course Description: This course is designed to develop an understanding of spectroscopy and its application in the elucidation of the structures of chemical compounds. This will include aspects of C H N S O elemental analysis, UV- visible spectroscopy, infrared spectroscopy, nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry. The fundamental physical and chemical principles of each method will be discussed. The major emphasis of this course is on chemical structure determination by way of interpreting the data (generally in the form of a spectrum or spectra) that each method provides.

Course ID: 1717031590 **Description:** Advanced Pharmaceutical Analysis

Full Course Description: This course is designed to develop an understanding of spectroscopy and its application in the elucidation of the structures of chemical compounds. This will include aspects of C H N S O elemental analysis, UV-visible spectroscopy, infrared spectroscopy, nuclear magnetic resonance (NMR) spectroscopy, and mass spectrometry. The fundamental physical and chemical principles of each method will be discussed. The major emphasis of this course is on chemical structure determination by way of interpreting the data (generally in the form of a spectrum or spectra) that each method provides.

Course ID: 1917031210 **Description:** Pharmaceutical Organic Chemistry (1)

Full Course Description: The course is designed to focus on the most important substance classes in organic chemistry (e.g. alcohols, amines, alkenes, alkynes, aldehydes, ketones, carboxylic acids, and carboxylic acid derivatives) with respect to their structure and their chemical properties. Naming by means of rational chemical nomenclature (IUPAC), including some common names, is an important part of this course. The interplay between structure and function will be discussed for a greater understanding of chemical reactions and processes. Further, organic-chemical reactions (e.g. substitution, elimination, addition to the alkene and the alkyne, carbonyl group reactions, carboxylic acid derivatives reactions, oxidation, and reduction) are discussed together with the associated reaction mechanisms.

Course ID: 1917031211 **Description:** Pharmaceutical Organic Chemistry (2)

Full Course Description: The course is planned to cover knowledge of organic chemistry with particular emphasis on heterocyclic organic compounds including their nomenclature, natural sources, and methods of synthesis. It covers the chemistry of different classes of heterocyclic and polycyclic aromatic compounds involving one or more heteroatoms with focusing on their medical and pharmaceutical importance. Additionally, the course will confer the stereo-chemical aspects of these systems focusing on their effect on drugs activities.

Courses Description

College: Pharmaceutical Sciences

Department:

Course ID: 1917031315 **Description:** Pharmaceutical Instrumental Analysis

Full Course Description: The course is designed to give the pharmacy student an overview of the various modern instrumental analytical technique used in pharmaceutical analysis. The requirements for instrumentation including the precision, accuracy, sensitivity, selectivity, detection limit, and dynamic range will be discussed during this course. Students will be taught how to identify the chemical structure from the complementary information afforded by four types of spectra: UV, IR, NMR, and MS. Additionally, the introduction to the chromatographic theory, separation techniques, and applications concerned HPLC and GC.

Course ID: 1917031323 **Description:** Medicinal Chemistry (1)

Full Course Description: This course explains the effects of a drug's structure and physicochemical properties on pharmacokinetics ADME (Absorption, Distribution, Metabolism and Excretion), pharmacodynamics (reaction of drug with its receptor), and drug metabolism (phase I (oxidative, reductive, and hydrolytic biotransformation) and phase II (conjugation). Prodrugs also will be discussed. In addition, the structure activity relationship of the different drug classes including autonomic nervous system, cardiovascular system, antiasthmatic and antiallergic drugs, drugs used in gastric ulcer and hormone therapy and the effect of chemical modification on the efficacy and the physicochemical properties of these groups of compounds.