Courses Descriptions

Department of Clinical Sciences

Principles of Human Anatomy and Physiology I (2-2-3)

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

Pre-requisite: NA

Introduction to pharmacy (2-2)

This course introduces professions and professionalism as concepts and presents the profession of pharmacy. It covers history of the pharmacy profession and factors that affected evolvement of pharmacist role and service. The course also covers pharmaceutical and medical abbreviations used in practice, the prescription, its anatomy and its legal requirements. The course gives students a view of the pharmacist career options in the settings of retail, hospital, industry, research and academia. This course will also offer some concepts of pharmaceutical calculations used in practice.
Pre-requisite: NA

Biochemistry I (2-2)

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

Pre-requisite: PHA110

Principles of Human Anatomy and Physiology II (2-2-3)

The course provides basic knowledge of normal human body structure and function necessary for students of Faculty of Pharmacy & Medical Sciences to be capable of understanding other related

pathological and clinical medical courses. It also assists students to properly understand the pharmacology of drugs and its application in clinical pharmacy.

Pre-requisite: PHA130

Communication skills in pharmacy (2-2)

This course aims to introduce skills in pharmacy communications and patient assessment and management. Types of communication such as verbal and nonverbal and written communications and their application in patient care will be covered. It also aims to introduce patient counseling and advice giving in the context of medication use.

Pre-requisite: NA

Biochemistry II (2-2-3)

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

Pre-requisite: PHA115

Pharmacology I (2-2-3)

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

Pre-requisite: (PHA131) + (PHA115)

Pharmaceutical Microbiology and Immunology I (2-2)

Microbiology and Immunology I designed to introduce the students to microbe's world exemplified by Prokaryotes, Eukaryotes and the unique properties of the viruses. Trying to give a brief and up-date presentation of those aspects of medical organisms that can inflict damages to human health. Explore sterilization techniques. Antibiotics discussed at length.

Immunology as rapidly developing field plays a pivoted role in health and disease so it deserve a fair share in this course

Pre-requisite: (PHA115)

Principles of Pharmaceutical Care (2-2-3)

The purpose of this course is to introduce patient assessment techniques and documentation. It also provides students with the background and application of pharmacist-provided patient-centered care.

Pre-requisite: (PHA172)

Introductory Practice Experience (1-1)

The course provides an introduction to the Profession of Pharmacy and practice**.** It provides students with an opportunity to experience a broad range of pharmacy practice experiences early in their academic career including community and institutional pharmacy and allows students, under appropriate supervision and as permitted by regulations, to take on medication distribution and direct patient care responsibilities.
Pre-requisite: (PHA172)

Pharmacology II (2-2-3)

This course provides students with in-depth pharmacological knowledge on cardiovascular, renal, blood and gastrointestinal medications. The course aims to improve students' ability to understand the pharmacodynamics and pharmacokinetic properties, mechanism of actions, adverse effects, indications and contraindications of these drugs.

Pre-requisite: (PHA230)

Pharmaceutical Microbiology and Immunology II (2-2-3)

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

Pre-requisite: (PHA260)

Therapeutics I (2-2-3)

This course provides students with in-depth therapeutic knowledge on cardiovascular and respiratory, gastrointestinal disorders (GIT). The course aims to improve students' ability to

identify and critically assess the relevant factors for the management of patients with cardiovascular, respiratory, and GIT diseases. Further, it is designed to help students integrate drug therapy into an overall cardiovascular/respiratory or GIT disease management plan

Pre-requisite: (PHA270)

Pharmacology III (3-2-4)

This course provides students with in-depth Pharmacological and Therapeutic knowledge on Central Nervous System and endocrine medications. The course aims to improve students' ability to understand the pharmacodynamics and pharmacokinetic properties, mechanism of actions, adverse effects, indications and contraindications of these drugs.

Pre-requisite: (PHA231)

OTC drug and products (3-2-4)

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

Pre-requisite: (PHA270)

Therapeutics II (2-2-3)

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

Pre-requisite: (PHA270)

Chemotherapy (3-3)

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

Pre-requisite: (PHA332)

Therapeutics III (2-2-3)

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

Pre-requisite: (PHA270)

Pharmacy Management and Pharmacoeconomics (2-2)

The course covers concepts of personal, human resource and business management in pharmacy practice. This module is an introduction to the role of pharmacoeconomics (PE) in medical decision making from multiple perspectives. It will introduce the concepts of types of PE/Cost-effectiveness analysis (CEA), general computation involved in these analyses, and how to evaluate a CEA.

Pre-requisite: (PHA276)

Arabic Language Competence in Pharmacy (3-3)

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

Pre-requisite: After completion of 100 Cr.Hr. and 1021400

Principles and Practice of Toxicology (2-2)

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

dose, diagnosis and treatment with focus on antidotes and, the basic principles and mechanisms of toxicology as applied to various chemicals or classes of chemicals in selected tissues and organs.

Pre-requisite: (PHA332)

Graduation Project (3-3)

By the time students reach this level (115Crd.Hrs) they will have studied a range of pharmaceutical topics, and have gained some experience of the techniques used in research, through lecture and workshop. Students will initially undertake a period of open-learning time covering research methodology and then spend a period of time on a course of specialist study. The faculty project committee has recently decided that this project should be run across both semesters in the final year. This will enable students to investigate an area of clinical pharmacy in significant detail, under supervision.

Pre-requisite: (PHA378)

Pharmacogenomics (2-2)

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

Pre-requisite: (PHA376)

Pharmaceutical Marketing (2-2)

This course is designed to provide students with a comprehensive understanding of the principles and aspects of pharmaceutical marketing to explore the major components of the marketing mix, including product, place, promotion and pricing, and their role in pharmaceutical industry. This prepares future pharmacy practitioners with the fundamentals of analytical and decision-making skills to create basic marketing strategies. The learning method involves using of group discussions with the role models to facilitate communication, critical thinking, problem solving, and team

building skills. It also involves in-depth and detailed examination of a number of case studies related to pharmaceutical marketing.

Pre-requisite: (PHA378)

Pharmacy Law and Ethics (2-2)

The course will cover an overview of the laws and regulations governing pharmacy practice and drug control in the UAE. Professional competency of pharmacists and international standards of practice will be covered. Ethical principles and codes that govern the practice of pharmacy and medicine in patient care are discussed.

Pre-requisite: (PHA378)

Pharmacovigilance and Epidemiology (2-2)

The course aimed to describe concepts and principles of pharmacoepidemiology in the broad context of therapeutic evaluation and drug decision-making.

It prepares students to develop a methodology to study medication use in large number of population, reports adverse drug reaction and use post-marketing surveillances, drug utilization reviews in order to study the safety and efficacy of medications.

Pre-requisite: (PHA378)

Professional Experience Rotation I (3-3)

The objectives of this initial training is to develop students' communication skills, knowledge of community pharmacy practice and to become familiar with different trade of the over- the- counter (OTC) and generic names of some drugs available in the market. In addition, students are expected to understand how to respond to commands in the different types of prescriptions.

Pre-requisite: (PHA370) + (PHA376)

Professional Experience Rotation II (3-3)

Through the utilization of selected community pharmacies and competency-based objectives, the student will gain an appreciation for the profession of pharmacy as practiced in the community and develop professional attitudes, judgment and skills needed to function in this setting.

Pre-requisite: (PHA370) + (PHA376)

Professional Experience Rotation III (3-3)

The course will provide an opportunity for students to work with dedicated mentors from the field on real-world industrial issues related to pharmaceutical marketing.

Pre-requisite: (PHA370) + (PHA376)

Professional Experience Rotation IV (3-3)

This training course will familiarize the student to hospital pharmacy practice in the inpatient and outpatient settings. The training is designed to provide students with the preparation needed to understand the practice environments they will enter and to expose them to areas of pharmacy practice they may have not previously considered within the hospital environment.

The student will learn different concepts in the hospital pharmacy, the philosophy of pharmacy consultant services and how to implement pharmaceutical care services. Moreover, the student will develop professional attitudes, judgment and skills needed to function in this setting. He will learn methods used to monitor drug therapy in the patient, treatment of common disease states seen, and how to effectively communicate with patients and health professionals regarding drug utilization. Where available, the student will be involved in the different operations carried out in the inpatient setting.

Pre-requisite: (PHA370) + (PHA376)

Professional Experience Rotation V (3-3)

This training course (clerkship) will introduce the student to clinical pharmacy practice in the inpatient setting through clinically oriented patient-specific and non patient-specific activities. The student will learn clinical pharmacy concepts, the philosophy of pharmacy consultant services and how to implement pharmaceutical care. In addition, the student will be exposed to methods used to monitor drug therapy in the patient, clinical manifestations,

treatment and monitoring parameters of common disease states seen, and how to effectively communicate with patients and health professionals regarding drug utilization.

Pre-requisite: (PHA370) + (PHA376)

Department of Pharmaceutical Sciences

Pharmaceutical Organic Chemistry I (2-2-3)

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

Laboratory work concerning specific chemical reactions, organic synthesis, identification of organic compounds and synthesis of aspirin.

Pre-requisite: NA

Pharmaceutical Analysis I (2-2-3)

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

Pre-requisite: NA

Physical Pharmacy (3-2-4)

This course provides students with basic physicochemical principles of solubility and solution properties of drugs, factors affecting solubility, surfactants, micellization, solubilization, and partitioning of drugs between immiscible solvents.

Rheological properties of various pharmaceutical formulations shall be covered.

The course also covers basic principles pertinent to explain characteristics and behavior of pharmaceutical dispersions including colloids, suspensions, emulsions, aerosols & semisolids. Physicochemical drug interactions and incompatibilities shall also be covered.

Pre-requisite: NA

Pharmaceutical Organic Chemistry II (2-2-3)

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

Laboratory work concerning specific chemical reactions, organic synthesis, identification of organic compounds and synthesis of paracetamol.

Pre-requisite: (PHA110)

Pharmaceutical Analysis II (2-2-3)

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

Pre-requisite: (PHA120)

Pharmaceutical Dosage Forms I (2-2-3)

The course comprised of principles and techniques involved in the formulation, preparation and evaluation of solid dosage forms. It covers physical properties of powders, preparation of bulk and divided powders, as well as effervescent and non- effervescent granules. Capsules and tablets types, methods of production/filling and storage are described. The course also covers rectal drug absorption, formulation and evaluation of suppositories. Counselling patients regarding the proper use of selected solid dosage forms will be emphasized during the course.

Pre-requisite: (PHA102)

Medicinal & Pharmaceutical Chemistry I (2-2-3)

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

receptor binding and drug metabolism. The second part of the course is devoted to the study of chemotherapeutic agents.

Pre-requisite: (PHA113)

Pharmaceutical Dosage Form II (2-2-3)

This course covers basic principles of drug stability, routes of drug degradation and various means of avoiding them. It also covers sterile products including parenteral and ophthalmic preparations; their advantages & disadvantages, formulations, quality control tests and various sterilization procedures. In addition, aseptic techniques applied during the preparations of sterile products shall be covered. The course also includes an introduction to sustained released products, as well as packaging materials.

Pre-requisite: (PHA200)

Medicinal & Pharmaceutical Chemistry II (2-2)

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

Pre-requisite: (PHA222)

Pharmaceutical Biotechnology (2-2)

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

Current some marketed biotechnology drug products, as well as the future prospects of biotechnology shall be discussed.

Pre-requisite: (PHA260)

Drug Information & Literature Evaluation (2-2-3)

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

Pre-requisite: (PHA172)

Pharmaceutical Technology (2-2-3)

This course covers theoretical aspects & practical demonstration of different manufacturing unit processes like; heat transfer, filtration, particle size reduction, and particle size analysis. The course also examines preformulation studies and identify essential manufacturing steps, including powder mixing, powder flow, granulation, and drying that are applied in pharmaceutical industries. The course shall also cover the principles and guidelines applied in the design & operation of clean rooms.

Pre-requisite: (PHA201)

Biopharmaceutics and Pharmacokinetics I (2-2-3)

This course focuses on biopharmaceutics aspects of how drugs get to the site of absorption, drug dissolution, membrane permeability, bioavailability and bioequivalence. More specifically, students are introduced to the importance of drug plasma levels, and the physiological and cell biology background related to gastrointestinal tract drug absorption. The routes of drug administration and formulation factors are covered as they influence its bioavailability. Emphasis are given to discuss bioavailability and bioequivalence along with the new drug development process.

Pre-requisite: (PHA201)

Pharmaceutical Quality Assurance (2-2-3)

This course provides students with an overview of quality management systems in pharmaceutical industry and patient care units. Regulatory requirements during manufacturing and control of pharmaceuticals including various good practices will be covered. Drug approval process and registration in local, regional, and key Arab and international world pharmaceutical markets will be discussed. The course also focuses on the selection criteria for suitable methods of drug analysis, the organization of quality control laboratories, and the detection and analysis of

counterfeit pharmaceutical products. A selected number of drugs in various dosage forms will be experimentally characterized.

Pre-requisite: (PHA121) + (PHA201)

Biopharmaceutics and Pharmacokinetics II (2-2-3)

Pharmacokinetic concepts are introduced, including the concepts of pharmacokinetic models, linear and nonlinear pharmacokinetics, clearance and volume of distribution as they relate to drug concentration-time relationships for common routes of administration. Physiologic determinants of variability including age, body composition, renal and hepatic disease are also covered in relation to clinical application of pharmacokinetics.

Pre-requisite: (PHA302)

Pharmacognosy (2-2-3)

Study of basic knowledge of official medicinal plants. The study includes brief morphological and microscopical characters as well as chemical active constituents as means for identification and authentication of these plants. Pharmacognostical Monographs of selected Pharmacopeia's medicinal plants are included in the study.

Pre-requisite: After 80 credit hours

Complementary and Alternative Medicine (CAM) (2-2-3)

In this course, CAM is classified into SIX Systems, based on different philosophies:

1- Alternative Medical Systems;
2- Mind-Body System;
3- Biological-Based System;
4- Manipulative Body- Based System;
5- Energy System;
6- Blood Cupping.
7- This in addition to Iridology as a diagnostic technique. Each of these systems include different therapies which are given in detail, including definition, philosophy, techniques, indications, and contraindications for each therapy.

Pre-requisite: After completion of 100 Cr.Hr.

Phytotherapy (2-2-3)

Study of Phytomedicines including their active constituents, preparation and therapeutic value relevant to Pharmacist and Complimentary Practitioners. The course also includes

pharmacodynamic and pharmacokinetic studies of the active constituents to support research and development in the field of Pharmacy.

Monographs and *Materia Medica* of Phytomedicines are included in the study.

Pre-requisite: (PHA326)

Professional Experience Rotation III (3-3)

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

Pre-requisite: (PHA300)