



# COLLEGE OF PHARMACY

## COURSE DESCRIPTION

### **PHRM 131: Orientation to Pharmacy**

2 C.H.

This course covers history of pharmacy, orientation to pharmacy, scope of pharmacy, careers, education, local and international organizations, information resources in pharmacy and pharmaceutical sciences, drug literature, an introduction to various drug delivery systems concerning definition, route of administration, advantages, disadvantages and the prescriptions.

**Practical work:** covers preparation of waters, simple solutions, douches, enemas, gargles, mouthwashes, juices, nasal solutions, ear solutions, irrigation solution syrups, mucilages, jellies, collodions, elixirs, glycerins, inhalations and liniments.

### **PHRM 132: Pharmaceutical Organic Chemistry:**

5 C.H.

This course covers: classification, properties, structure, nomenclature, radicals and groups, of organic pharmaceuticals as acids, alcohols, aldehydes, ketones, phenols, ethers, polynuclear, alkanes, alkenes, aromatic hydrocarbons, alkadienes, alicyclics, halides, amines, anilines, hydralazine, and heterocycles found in official pharmaceuticals

**Practical work:** covers identification of constants and certain pharmaceutical organic chemicals.

### **PHRM 221: Anatomy and Histology**

4 C.H.

This course covers the macro and micro structure of major body systems: integumentary, muscular, skeletal, cardio-vascular, lymphatic, respiratory, digestive, nervous, endocrine, urinary and reproductive systems.

**Practical work:** covers demonstrations of the various organs and microscopic investigations of various, cells and tissues

**PHRM 433: Pharmaceutics (1)**

3 C.H.

This course covers weights and measures, weighing and measuring, density and specific gravity, pharmaceutical calculations, significant figures, fractions, exponents, powers and roots, laws and rules logarithmic calculations, household equivalents, dosage calculation, problem solving methodology, stock solutions, and milli-equivalents, molecular structure, statistics in pharmacy, properties and states of matter, solution and phase equilibriums, ionic solutions, electrolytic equilibriums, tonicity, osmolality, interfacial phenomena, colloidal and coarse dispersions and rheology.

**Practical work:** covers adjustment of tonicity, osmolality, measurements: of surface tension, viscosity, partition coefficient, pH, buffers, and buffer capacity.

**PHRM 232: Pharmaceutical Analytical Chemistry**

4 C.H.

This course covers preparation of solutions, indicators for determining end points, potentiometric determination of end points, acid- base reactions, precipitation reactions, redox reactions, complexation reactions, acid-base reactions, nonaqueous solvents, gravimetric analysis, spectrometry, geometric analysis, volumetric measurements, optic rotation, specific gravity and radioactivity as methods for analysis of drugs.

**Practical work:** covers examples of titrimetric (acid – base and residual) precipitation reactions (direct and residual), redox reactions (direct and residual), complexation (direct and residual) and large anion reagent and large action reagent reactions, gravimetric, spectrophotometric methods, electrochemical, miscellaneous methods, and distillation for analysis of drugs.

**PHRM 321: Physiology**

2 Cr. Hs.

This course covers cell physiology, molecular aspects of cell biology, and the functions of major body systems: integumentary, muscular skeletal, cardiovascular, lymphatic, respiratory, digestive, nervous, endocrine, urinary, and reproductive systems, body fluid and electrolytes, along with homeostatic mechanism maintaining normal function of the body, with demonstrations of relevant measurements.

**PHRM 435: Pharmacognosy**

3 C.H.

This course covers structure of animal and plant cells, basic botanical structure, microscopy, active constituents, uses and storage of Pharmacopeial medicinal herbs, medicinal herbs containing carbohydrates, fixed oils, tannins, alkaloids, glycosides, volatile oils, gums and mucilages, drug-medicinal-herbs interactions

**Practical work:** covers macro and micro investigations of medicinal herbs.

**PHRM 532: Pharmaceutics (2)**

3 C.H.

This course cover micromeretics, physico- chemical principles of dosage forms, preformulation classification, types, ingredients, production on large scale, quality control of powders, granules, capsules, tablets, controlled release products, suspensions, semisolid and heterogeneous drug delivery systems.

**Practical work** includes micromeretics of powders, formulation, preparation, packaging, labeling and quality control of suspensions, suppositories, ointments, creams, pastes, powders, granules tablets, and capsules.

**PHRM 631: Pharmacology (1)**

3 C.H.

This course covers mechanism of action of drugs in various categories, dose – response relationship, pharmacodynamics of drug action, ADME, drug receptor interactions, cellular and molecular targets of drug action, pharmacology of drugs affecting the autonomic nervous system and central nervous system, autocooids and their antagonists, non narcotic analgesics-antipyretics,, NSAIDs, drug – drug, drug – food, drug – lab test, drug – pollutant interactions, adverse drug reactions.

**Practical work** covers models for dose response relationship including CAL, anti cholinesterase, demonstration of nicotinic and muscarinic effects of parasympathomimetics,  $\alpha$  and  $\beta$  effects of catecholamines and their antagonists, action of dopamine glycoside, and calcium antagonists on heart, action of pilocarpine and atropine on eye.

**PHRM 736: Pharmaceutical and Medicinal Chemistry (1)**

3 C.H.

This course covers physicochemical properties of drug molecules in relation to drug ADME, drug nomenclature program , international nonproprietary names , structure activity relationships, fundamental pharmacophores for drugs used to treat diseases, pharmaceutical medicinal chemistry of drugs affecting central nervous system, autocooids and their antagonists non narcotic analgesics-antipyretics and NSAIDs, analysis using IR, UV, NMR and MS

**Practical work** covers analysis of representing examples of the above groups of drugs, according to USP or BP.

**PHRM 323: Microbiology and Virology**

4 C.H.

This course covers classification, structure, culture, identification, properties of medically significant bacteria, pathogenic mechanisms of microorganism, principles of infectious diseases, hostel – parasite relationship, inflammatory response to infections, clinical aspects of infection, examples of invasive and chronic diseases, fungal infection , parasites and protection by vaccines.

Virology includes virus structure multiplication, diseases, mechanism of transmission, defenses against infection and antiviral drugs.

**Practical work** includes microscopy of bacteria, fungi and parasites, bacterial culture, selective media, antibiotic sensitivity, fungal, parasite and viruses demonstrations.

**PHRM 424: Pathophysiology**

2 C.H.

This course covers introduction to pathology, the importance of pathophysiology for pharmaceutical care; its correlation to various diseases, the basic principles of diseases including inflammation and repair, degeneration, disturbances of hemodynamics, developmental defects, neoplasm, certain cardiovascular, respiratory, bone, joints, and endocrine pathogenic problems.

**PHRM 422: Biochemistry / Biotechnology**

4 C.H.

This course covers chemistry of proteins, lipids, carbohydrates and DNA, enzymology, bioenergetics, and metabolic pathways of energy utilization, mitochondrial respiration and oxidative phosphorylation, active transport, phosphate pathway and Krebs cycle, nucleic acid metabolism including DNA replication and repair, RNA and protein synthesis, recombinant and DNA technology, carbohydrates, fats, amino acids, and hormones metabolism.

**Practical work** includes UV – visible absorption spectroscopy, separation of proteins by column chromatography, subcellular fractionation of rat liver, enzyme kinetics, and mitochondrial bioenergetics, PCR and biochemical calculations.

**PHRM 523: Immunology**

2C.H.

This course covers human immunity and immune response, including innate and acquired immunity, determinants and control of immune response, serology of infection, molecular biology of immune response, genetic basis of antibody synthesis, development and function and immunopathology, hypersensitivity, assessment of immunocompetence, immunotherapy with demonstrations of relevant subjects.

**PHRM 833: Pharmaceutical and Medicinal Chemistry (2)**

3 C.H.

This course covers pharmaceutical medicinal chemistry of cardiovascular drugs and diuretics, GIT drugs, respiratory drugs, endocrinology and related drugs, anti-infective drugs, radionuclides, and antineoplastics.

**PHRM 731: Pharmacology (2)**

4 C.H.

This course covers the pharmacology of cardiovascular drugs, diuretics, GIT drugs, respiratory drugs, endocrinology and related drugs, anti-infective drugs, and antineoplastics

**PHRM 332: Phytochemistry and Complementary Medicine**

2 C.H.

This course covers composition, classification, structure, physicochemical properties, occurrence, analysis and uses of carbohydrates, glycosides lipids, peptides, polypeptides, alkaloids, volatile oils, resins gums and mucilages. Also, it provides types, limitations and uses of acupuncture, acupressure, aroma therapy, hydration therapy, homeopathy, food therapy, music therapy magnet therapy and other complementary medicines.

**PHRM 722: Clinical Chemistry**

2 C.H.

This course covers the fundamentals of laboratory medicine and its importance in screening, diagnosis and evaluation of patient's clinical data relevant to state management, technique used for bioanalysis as hematology, serum levels of hormones, glucose, glycosylated hemoglobin, lipids, uric acid, electrolytes, minerals, urine analysis, and stool analysis and other biological fluids analysis and diagnostics.

**Practical work:** include analysis of bloods, stool, urine, other biological fluids, evaluation of patient profiles concerning various laboratory tests, and diagnostics.

#### **PHRM 644: Biopharmaceutics and Pharmacokinetics**

4 C.H.

This course covers physicochemical factors affecting drug absorption, dissolution rate as rate determining step, generic equivalence and its implication in practice, bioavailability – bioequivalency and dosage uniformity. Pharmacokinetics includes basic principles of ADME, kinetic principles of pharmacodynamic design, and different models of drug distribution, multiple dose administration, non compartmental analysis following instantaneous input, clearance, dose –and time – dependent pharmacokinetics.

**Practical work** includes studying factors affecting dissolution rate of various dosage forms, calculation of C max, T max AUC to assess bioequivalence and calculation of pharmacokinetic parameters.

#### **PHRM 831: Toxicology**

2 C.H.

This course covers the mechanism of toxicity, toxic effects of different agents on the body, including drug overdose, toxic signs, drug abuse, and toxicity of: alcohol, barbiturates, hypnotics, inhalants marijuana, nicotine, amphetamine cocaine, hallucinogens, anabolic steroids, pesticides, insecticides and pollutants with demonstrations. Also, this course includes application of statistics in biological assays and clinical studies.

**Practical work:** demonstrations and experiments on toxicity of drugs and various agents and biostatistics problems.

#### **PHRM 744: Pharmacy Practice and Pharmaceutical Care**

3 C.H.

This course includes an over view of pharmacy profession world wide, issues of contemporary pharmacy on national and international levels, emerging and unique roles of the pharmacist as an active member in the health care team, concepts of

pharmaceutical care, medication therapy, management services, patient- oriented pharmacy services , SOAP system for pharmaceutical care, with review of systems in details , methods and outcomes of monitoring and assessment techniques, development of pharmaceutical care plans relative to disease states, role of pharmacist in ambulatory institutional and long term care.

**Practical work:** covers pharmaceutical care of selected cases using SOAP technique.

#### **PHRM 541: Drug Information and Literature Evaluation**

3 C.H.

This course includes the pharmacist and drug information, fundamentals of the practice of drug information, types of literature with evaluation for each, application of drug information skills for the delivery of pharmaceutical care and pharmaceutical industry, understanding the practical implications of the literature, technology of drug information, and retrieval for quality assurance

**Practical Work** includes solving problems of case studies for selection of drugs of choice for the treatment of diseases, drugs interactions, contraindications, dose adjustment, and I.V. admixtures.

#### **PHRM 545: Pharmacogenomics and Pharmacoepidemiology**

3 C.H.

**Pharmacogenomics** includes genetic basis for diseases and drug metabolism due to glucose 6-phosphate dehydrogenase, globin and heme metabolizing enzymes, catechol – o–methyltransferase, thiopurine methyl transferase, glycolytic enzymes, dihydropyrimidine dehydrogenase, N- acetyl transferase enzymes, choline- esterase, cytochrome P450 isoenzyme(CYP2D6), cytochrome P450 isoenzyme(CYP2C19), HGPTASE, alcohol dehydrogenase ,genetic basis for alternation of drug metabolism and genome and proteomic principles in relation to disease and drug development.

**Pharmacoepidemiology** covers the application of epidemiology to the study of drug use and outcomes in large population, studies that provide an estimate of the probability of beneficial effects in populations and other parameters relating to drug use, benefits and methods of continual monitoring of untoward effects and other safety – related aspects of drugs, recall and withdrawal of drugs from the market.

**Practical work** provides calculations of clinical pharmacokinetic parameters and TDM

#### **PHRM 642: Non – Prescription Drugs**

4 C.H.

This course covers the role and the responsibilities of the pharmacist for patient's self care , his triangle function, product – related factors , patient – related decision factors, counseling, gaining the patient's cooperation , precautions, using examples of : skin, hair, nail, eye, ear, nose, respiratory tract , GIT, urinary tract, female, children, dental diseases, weight control, sleeping aids, smoking cessation, fever, pain, cosmetics, nutraceuticals and milk products.

**Practical work** covers pharmaceutical care of cases related to above diseases.

#### **PHRM 623: Medication Dispensing and Distribution System**

3 C.H.

This course covers preparation and dispensing of prescription, patient medication profiling and issues of distribution systems.

**Practical work** covers reviewing, dispensing and distribution of prescriptions.

**PHRM 743: Patients Assessment Laboratory**

2 C.H.

This course covers basis of patient physical assessment ,cultural considerations in patient assessment, health and medication history, general assessment and vital signs, ,principles and methods of basic physical examination, skills related to various diseases that help to achievement of SOAP, including, height, BMI, vital signs, blood pressure, heart rate, EKG, heart and respiratory sounds, skin rashes, changes in nails, hair, eyes, ears, head, neck, functions of liver and kidney as well as all reviews of systems(ROS).

**Practical work** covers measurements of blood pressure, BMI, body temperature, heart rate bowel rate, respiratory rate, EKG, kidney function, and demonstrations of skin rashes, changes in nails, hair, eyes, ear, head, and neck as well as other parameters

**PHRM 745: Pharmacotherapy (1)**

3 C.H.

This course covers the epidemiology, etiology, pathophysiology, principles of non-pharmacological and drug treatment, evaluation of clinical trials, and drug monitoring of certain gynecological, obstetric, pediatric, renal and urological diseases.

**Practical work:** provides pharmaceutical care of cases

**PHRM 844: Pharmacotherapy (2)**

3 C.H.

This course covers the epidemiology, etiology, pathophysiology, principles of non-pharmacological and drug treatment, evaluation of clinical trials, and drug monitoring of certain nutritional, cardiovascular infectious diseases, eye disorders and skin disorders.

**Practical work:** provides pharmaceutical care of cases

**PHRM 845: Pharmacotherapy (3)**

3 C.H.

This course covers the epidemiology, etiology, pathophysiology, principles of non-pharmacological and drug treatment, evaluation of clinical trials, and drug monitoring of certain neurological, psychiatric, bone and joint disorders, and immunological disorders

**Practical work:** provides pharmaceutical care of cases

**PHRM 846: Pharmacotherapy (4)**

2 C.H.

This course covers the epidemiology, etiology, pathophysiology, principles of non-pharmacological and drug treatment, evaluation of clinical trials, and drug monitoring of certain GIT and respiratory and endocrine diseases

**Practical work:** provides pharmaceutical care of relevant cases

**PHRM 457: Social and Behavioral Aspects of Practice**

1 C.H.

This course covers Pharmacy as a profession, professionalism, image of the pharmacist by health care providers and patient, role of the pharmacist in health care and his interaction with health care professionals, patient's behavior and models used to prevent bad behaviors.

**PHRM 456: Pharmacy Law and Regulatory Affairs**

1 C.H.

This course covers legal basis of pharmacy practice in UAE as compared to other countries, rules of professional conduct, pharmacist responsibilities and limits under the law, pharmacist's role in reducing liability by reducing drug related misadventure, principles of civil and criminal liability, principle of business contract, rules of initiation of a pharmacy , and industrial pharmacy .

**PHRM 857: Practice Management / Health Care Systems**

1 C.H.

This course covers the management principles applied to various pharmacy practice setting, principles of planning, evaluation, organizing, directing and controlling and operating pharmacy resources, tools and needs to address changes , increase competitiveness and optimize patients services,  
Also, an introduction o health care system in UAE, social, political and economic factors of UAE health care system, principles that influence the distribution of products and services role of public and private insurances and pharmaceutical industry to improve health resources are covered by this course.

**PHRM 858: Practice Marketing / Pharmacoeconomics**

2 C.H.

This course covers an introduction to economics, definition of economic terms, economic principles, concepts of Pharmacoeconomics for drug selection, application of economic theorists of evaluation and quality of life concepts to improve allocation of limited health care resources.

Marketing section covers functions of pharmaceutical marketing department, selling, transport, distribution, storage and order-system, principles of promotion, principles of finance exportation, insurance systems, and principles of accounting.

**PHRM 061: Professional Practice Experience (1)**

120 Contact Hours = 3 C.H.

This is an introductory pharmacy practice experience carried out to develop students practice skills in interaction with community pharmacists; assistant pharmacists and patients, arrangement and storage of medications, dispensing and recording of prescriptions and identifying medicaments grouping and their producing companies. A special logbook is designed for this course.

**PHRM 062: Professional Practice Experience (2)**

120 Contact Hours = 3 C.H.

This is the second introductory pharmacy practice experience carried out to improve student's practice skills in interaction with more health care professionals as physicians besides community pharmacists, professional attitudes, confidence and personal responsibilities, dispensing and prescriptions. A special logbook is designed for this course.

**PHRM 063: Professional Practice Experience (3)**

120 Contact Hours = 3 C H.

This is carried out to optimize student's skills for interaction with patients through self care and selection non-prescription drugs, conducting physical assessment of patient referral, direct interaction with health care professionals for drug related problems, interpreting and evaluating patient information, dispensing and administering medications, assessing patient's adherence, and documenting interventions in patient records. A special logbook is designed for this course.

**PHRM 961-963: Advanced Professional Practice (4)**

**Hospital Pharmacy, Drug information and Clinical Pharmacy** 480 contact hours =12C.H.

This advanced professional practice experience is carried out in hospitals for participation in hospital – care, ambulatory care and acute care. The students must participate in activities including pharmaceutical care, patients' pharmacotherapy, identifying and resolving drug-related problems, patients' education, applying and dealing with scientific publications, assessing patient's adherence, preparing and dispensing prescriptions, carry out patients' consultation, managing the medications use. A special logbook is designed for this course.

**PHRM 964: Industrial Pharmacy Experience**

80 Contact Hours = 2 C.H.

This comprises participation in activities of arrangement, and storage of raw materials and finished products, production of medications and quality control of raw materials and finished products in addition to GMP, quality assurance and ISO-systems. A special logbook designed for this course.