

BACHELOR OF PHARMACY

Academic Programs

The College of Pharmacy encompasses three departments: Department of Pharmaceutics and Pharmaceutical Technology, Department of Medicinal Chemistry, and Department of Pharmacy Practice and Pharmacotherapies. The College of Pharmacy offers one program that leads to the Bachelor of Pharmacy degree (B. Pharm).

Admission Requirements

A student must have a minimum average of 80% in the General Secondary School Certificate (Scientific Stream), or its equivalent for admission in the College of Pharmacy. However, acceptance of students is on competitive basis where students with 90% and above are accepted immediately and students with 80-89% are registered on a waiting list.

Admission to the College of Pharmacy is subject to satisfying the English proficiency requirement and the necessary academic preparation as described in the University section on Admission in this bulleting. Applicants should refer to that section for details on the admission requirements. In addition to satisfying the University requirements, applicants aspiring to join the College of Pharmacy must submit to a personal interview.

Graduation Requirements

The five-year Bachelor of Pharmacy degree comprises 170 credit

hours of study made up as follows:

- a. General Education: 24 credit hours.
- b. College Requirements: 146 credit hours

Period of Study

A Bachelor degree in Pharmacy is conferred upon a student if he/she completes 170 credit hours of courses, attains a minimum CGPA of 2.0, and has been recommended by the College to receive the degree. The curriculum is distributed over 10 semesters. Although the program may normally be completed in 5 academic years, the period of study in the College of Pharmacy may not exceed fifteen semesters. The curriculum is comprised of 24 credits of University requirements (UR) and 146 of College requirements (CR) as indicated in the following table.

B.Pharm. (170 Credit)				
	UR	CR	Total	
Mandatory Courses	12	143	155	
Electives Courses	9	-	12	
Special Topics in Pharmacy	-	3	3	
Total	24	146	170	

I. University Requirements and Electives

Every student is required to take 24 credit hours of general education courses distributed over six domains. Fifteen (15) credit hours

from university compulsory. The student has to select one course from domain 1-3 as nine credit of university electives (this applied to the students registered in 2016 and above)

Domain 1: Islamic Studies; take one of the following courses (3 Credits)

0104100	Islamic Culture	3
0104100	Islamic Culture In English (for non-Arabic Speakers)	3

Domain 2: Languages (6 Credits)

Arabic Language, Literature and Culture; take one of the following courses

0201102	Arabic Language (for Arabic Speakers)	3
0201105	Arabic Language (for non-Arabic Speakers)	3

English Language, Literature and Culture

0202121	English For Medical Sciences	3
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Domain 3: IT (3 Credits)

1411100	Introduction to IT(English)	3
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Domain 4: Literature and Humanities (3 Credits)

0203100	Islamic Civilization	3
0602246	Human Rights in Islam and International Declarations	3
0201140	Introduction to Arabic Literature	3
0203200	History of the Sciences among Muslims	3
0203102	History of the Arabian Gulf	3
0900107	History of Medical and Health Sciences	3
0710109	Arts and Medicine	3

Domain 5: Applied Sciences, 3 Credits

1430101	Astronomy and Space Sciences	3
0401142	Man and the Environment	3
0500210	Health Awareness and Nutrition	3

Domain 6: Social Sciences and Education (3 Credits)

0206102	Fundamentals of Islamic Education	3
0204102	UAE society	3
0206103	Introduction to Psychology	3
0305110	Introduction to Economics (for non B) *	3
0302120	Introduction to Business for non-business students	3
0800107	Media in Modern Societies	3
0302327	Personal Finance*	3
0104130	Analytical Biography of the Prophet	3
* Not for students in the College of Business Administration		

Domain 7: one 3-credit hour course from Domain 4, 5, or 6

II. College Requirements

The College requirements consist of 143 credits of mandatory courses and **three credits** of elective course chosen from a group of selected topics.

Study Plan

The Bachelor of Pharmacy program encompasses 170 Credits distributed over 10 regular semesters that can be completed in five academic years. The following study plan serves as a roadmap for a smooth progression toward graduation.

Year 1, Semester 1 (16 Credits)			
Course #	Title	Cr Hrs.	Prerequisites
1101116	Chemistry for Pharmacy	3	
1101117	Chemistry for Pharmacy Lab	1	Pre/Co: 1101116
1102110	Human Biology	3	
1430113	Physics for Medical Sciences	3	
	General Education	3	
	General Education	3	

Year 1, Semester 2 (15 Credits)			
Course #	Title	Cr Hrs.	Prerequisites
1103111	Pharmaceutics A	3	
1440135	Calculus for Pharmacy	3	
1102113	Pathophysiology I	3	1102110
	General Education	3	
	General Education	3	

Year 2, Semester 3 (17 Credits)			
Course #	Title	Cr Hrs.	Prerequisites
1440136	Medical Biostatistics	3	1440135
1104251	Introduction to Pharmacy Practice	2	None
1101213	Medicinal Chemistry IA	3	1101116; 1101117
1103213	Pharmaceutics B	3	1103111
1102214	Pathophysiology II	3	1102113
	General Education	3	

Year 2, Semester 4 (19 Credits)			
Course #	Title	Cr Hrs.	Prerequisites
1104252	Public Health in Pharmacy	3	1104251
1101214	Medicinal Chemistry IB	3	1101213
1102241	Pharmaceutical Microbiology I	3	None
1102231	Biochemistry	4	1101213
1102321	Pharmacology IA	3	1102214
	General Education	3	None

Year 3, Semester 5 (19 Credits)			
Course #	Title	Cr Hrs.	Prerequisites
1104351	Social Pharmacy	3	1104252
1101311	Medicinal Chemistry IIA	3	1101214
1101311	Pharmaceutics IA	3	1103213
1102322	Pharmacology IB	3	1102321
1102341	Pharmaceutical Microbiology II	3	1102241
	General Education	3	

Year 3, Semester 6 (17 Credits)			
Course #	Title	Cr Hrs.	Prerequisites
1104352	Pharmacy Management	2	1104351
1101312	Medicinal Chemistry IIB	3	1101311
1103312	Pharmaceutics IB	3	1103311
1102421	Pharmacology IIA	3	1102321
1102351	Pharmacognosy	4	
	General Education	3	

Year 4, Semester 7 (15 Credits)			
Course #	Title	Cr Hrs.	Prerequisites
1104451	Drug literature Evaluation and Pharmacoeconomic	3	1104352
1101411	Medicinal Chemistry IIIA	3	1101312
1103411	Pharmaceutics IIA	3	1103312
1102422	Pharmacology IIB	3	1102321;1102231
1104421	Clinical Pharmacy IA	3	1102421; Co 1104451

Year 4, Semester 8 (17 Credits)			
Course #	Title	Cr Hrs.	Prerequisites
1104452	Principle of OTC Therapy	3	1104451

1101412	Medicinal Chemistry IIB	3	1101312
1103412	Pharmaceutics IIB	3	1103411
1102521	Pharmacology III	3	1102321; 1102341
1104422	Clinical Pharmacy IB	3	1104421
1104453	Law & Ethics	2	1104451

Year 5, Semester 9 (19 Credits)			
Course #	Title	Cr Hrs.	Prerequisites
1103511	Pharmaceutics III	3	1103412
1104521	Clinical Pharmacy II A	3	1104422, Co: 1104522
1104522	Clinical Pharmacy II B	3	1104422, Co: 1104521
1101521	Drug Development	3	Offered only to 4th and 5th Year students.
1105512	Graduation Project	4	Completion of 131 Cr.
110x5xx	Special Topics in Pharmacy	3	

Year 5, Semester 10 (16 Credits)			
Course #	Title	Cr Hrs.	Prerequisites
1104551	Professional Experiential Placement A	8	1104451, 1104452, 1104453 Co: 1104552
1104552	Professional Experiential Placement B	8	1104451, 1104452, 1104453 Co: 1104551

Course Coding

Accounting program courses are designated by numbers of the form 110XABC where:

X	Area (as follows) 1: Medicinal Chemistry 2: Pharmacology 3: Pharmaceutics 4: Pharmacy Practice and Clinical Pharmacy
ABC	Year, term and course sequence in area

Course Description

Competency outcomes acquired in various courses will help attain sound knowledge in pharmaceutical and clinical sciences and enable the students' integration of this knowledge with practical skills needed to offer pharmaceutical care for patients. The graduates will acquire analytical thinking processes that help them in communicating within multidisciplinary teams and in making evidence-based decisions about safe, effective and economic utilization of medications in the management and prevention of disease. As the students' progress through these courses, they transition from dependent to active self-directed learners who behave professionally according to ethical principles which governs pharmaceutical practice in their care of patients and in dealing with other professionals. Students are also introduced to different research methods used in conducting research projects along with familiarity with drug information resources available in conducting research projects and in providing patient care.

The following describes the contents of various pharmacy program courses.

Mandatory Core Courses

1430113 Physics for Medical Sciences

3-0:3

This introductory course covers topics in physics in life sciences, specifically in medicine, pharmacy, and other applied health fields. It discusses biological systems that can be analyzed quantitatively and how life sciences have been aided by physical or engineering analysis. The course includes a collection of problems, examples, and discussions at the boundary between physics and biology/medicine. Review of the basic concept in Mechanics, fluids motion, heat and thermodynamics, waves and sound, electricity and its application in biology and medicine, optics, the nature of atom, atomic spectra, nuclear physics and radioactivity, X-ray applications in biology and medicine. Applications of basic physics concepts in Medical Sciences including mechanics, fluids, heat and thermodynamics, waves and sound, electricity and magnetism, geometrical optics, atomic spectra and radiation. Prerequisite: None.

1101116 Chemistry for Pharmacy

3-0:3

This course reviews basic facts, concepts, and terminology of chemistry that are essential for medicinal chemistry and related subjects. It covers the atomic structure & periodic table, mole concept and stoichiometry, acid and bases, reactions in aqueous solutions, oxidation-reduction reactions, theories of bonding and structure, chemical equilibrium, acid-base equilibrium in aqueous solutions, as well as alkanes and cycloalkanes and their stereochemistry. It emphasizes the chemical background necessary to understand the various tests and procedures.

Prerequisite: None.

1101117 Chemistry for Pharmacy Lab

0-1:1

This course covers experiments on qualitative and quantitative aspects of chemistry as applied to medical and health

science, such as separation, identification, purification, and synthesis procedures. Prerequisite: Pre/Co 1101116.

1102110 Human Biology

3-0:3

This course gives students the chance to learn basic concepts and applications related to the human body. The course includes the structure and function of the normal cell; tissues in general, their different types, microscopic characteristics, locations, distribution and functions in the human body and of the different organ system and their respective roles and function in the organization of the body. The course is supported by multimedia and simulations to enhance student self-learning. Prerequisite: None.

1103111 Pharmaceutics A

2-3:3

This course covers several topics including basic pharmaceutical calculations, acids/ bases and buffer solutions, thermodynamics and heat capacity, phase equilibrium and the phase rule, partition behavior. Factors affecting solubility and dissolution. Formulation of solutions as dosage forms. Prerequisite: None.

1102113 Pathophysiology I

3-0:3

Basics of physiology, anatomy, histology and biochemistry. Pathophysiology of organ/ system. Synaptic transmission. Nervous system. Skeletal smooth and cardiac muscle. Circulation. Special senses. In addition to cells and tissue function and integrative body function. Prerequisite: 1102110.

1440135 Calculus for Pharmacy

3-0:3

Methods of differentiation; first and second derivatives and their application to maxima and minima problems. Integration methods and their application to rate equations (zero and first order) and chemical kinetics. Half-life. Exponential and power functions; plots using logarithmic scale graph papers. Triangular graph paper; plots and calculations. Integration methods and the solution of simple ordinary differential equations. The principles of partial differentiation, first and second derivatives, with an emphasis on application to thermodynamics and diffusion theory. Students will gain and appreciation of the application of calculus to physical chemistry, pharmaceutics and formulation. Prerequisite: None.

1104251 Introduction to Pharmacy Practice

2-0:2

The course provides students with important knowledge of topics related to pharmacy history, pharmacy profession, and different dosage forms and formulations available for different medications. The course will help students to begin using pharmaceutical calculations needed for compounding and dispensing of medications. Moreover, the course also covers basic skills and abilities needed to identify various pharmaceutical incompatibilities and basic techniques needed for identify different drug interactions.

Prerequisite: None.

1101213 Medicinal Chemistry IA

2-3:3

This course introduces students to the chemistry of organic compounds, their properties, synthesis, reactions and nomenclature. The functional groups covered in this course includes, alkane, chemical reaction, stereochemistry, alkyl halides, alkenes, alkynes, alcohols and ethers, The IR, and NMR-spectroscopy and their applications for structural determination. This course also includes practical experiments that allow students to master the synthetic methodologies related to some functional groups preparation, their purification, separation and structure elucidation.

Prerequisite: 1101116, 1101117.

1104252 Public Health Pharmacy

2-3:3

This course covers hospital pharmacy services and health systems, introduction to public health, definition, principles, the role of pharmacist in public health, health promotion and disease prevention and the role of pharmacist in their promotion. Alternative and complementary medicine – The nature and place of alternative and complimentary therapies in the health care system will also be covered in this course. Practical component covers aspects of compounding and proper dispensing.

Prerequisite: 1104251.

1103213 Pharmaceutics B

2-3:3

This course provides the student with good knowledge to study some physical pharmacy principles such as: colligative properties of solutions, isotonic solutions and Van't hoff factor. Rheology and flow properties of liquids and semisolids. Surface tension and interfacial phenomena. Physicochemical properties of disperse-systems and electrical and steric stabilization of colloidal systems.

Prerequisite: 1103111.

1102214 Pathophysiology II

2-3:3

Pathophysiology of each organ/system. Endocrine function. Skin. Respiration. Feeding, digestion and absorption. Liver, kidney and excretion. Temperature regulation. Reproduction and early embryological development. Blood and body fluids. Cellular reproduction and genetics. Prerequisite: 1102113.

1440136 Statistics for Pharmacy

3-0:3

Presentation of statistical data. The binomial, normal and log normal distribution. Normal probability and log probability graph papers. Sampling distributions. Confidence intervals. Student's t-distribution. Confidence intervals for the mean and for the difference of two means. Confidence interval for a proportion and for the difference of two proportions. Confidence interval for the variance, the chi square distribution. The confidence interval for paired data. Hypotheses testing. Regression and correlation. Contingency tables. Prerequisite: 1440135.

1101214 Medicinal Chemistry IB

2-3:3

This course introduces students to the chemistry of organic compounds, their properties, synthesis, reactions and nomenclature. The functional groups covered in this course includes aromatic compounds, amines, aldehydes, ketones, carboxylic acid, carboxylic acids derivatives. It also explains the principles of separation and mass spectroscopy as analytical techniques. This course also includes practical experiments that allow students to master the synthetic methodologies related to some functional groups preparation, their purification, separation and structure

elucidation.

Prerequisite: 1101213.

1102241 Pharmaceutical Microbiology I

2-3:3

Pharmaceutical Microbiology I aims to provide pharmacy students an introduction to fundamental microbiology and microbiological concepts, understanding the interaction between microbes, host and the resulting microbial diseases. The course will highlight the different classes of antimicrobial agents, their mechanisms of action, resistance and stewardship. This course covers different microorganisms such as bacteria, fungi, algae, protozoa and virus. It is expected that this

course will form the basis for pharmaceutical microbiology II and help students in understanding some topics in other courses such as pharmacology III.

Prerequisite: None.

1102231 Biochemistry

3-3:4

The subject will introduce the basic concepts of biochemistry and their application to biology and chemistry focused around interactions with humans or applied uses. This approach is designed to integrate the concepts of biochemistry and discourage rote learning. The specific topics that will be addressed are as follows: Structure and molecular properties of bio-molecules; Receptors, hormones and signaling processes; Metabolism; Catabolic pathways, synthetic pathways, energy production, control of metabolism; Information transfer (gene structure and regulation); Protein synthesis; and Molecular biology.

Prerequisite: None.

1103311 Pharmaceutics 1A

2-3:3

The course is designed to teach the students theoretical and practical formulation principles where the physicochemical properties of the drug and excipients may influence the formulation, component compatibility, manufacturing, bioavailability and stability of the final dosage form. The course deals with disperse systems and semisolids such as suspensions, emulsions, micro-emulsions, gels, ointments, aerosols, foams. Formulation principles of suppositories are also taught.

Prerequisite: 1103213.

1104351 Social Pharmacy

2-3:3

This course covers counseling and communications, communication skills, professional-patient communication, interviewing skills, listening skills and barriers to communications. Consumer Medicine Information Leaflets The course also covers patient centered care concept and pharmaceutical care definition, process and steps for pharmaceutical care application. Social pharmacy issues like adherence, the problem of noncompliance, placebo effect and illness behavior, men's and women's health are covered in this course. The hospital admission and discharge process is also included.

Tutorials will cover the hands on experience for counseling, role playing, oral and written communications, and the use of computer programs to retrieve information.

Prerequisite: 1104252.

1101311 Medicinal Chemistry IIA

2-3:3

This course introduces students to the heterocyclic organic chemistry with examples from medicinal and pharmaceutical industry that are having heterocyclic structures. This course covers the nomenclature, synthesis and reactions of six-membered aromatic heterocyclic with one and two heteroatoms, five-membered aromatic heterocycles with one and two heteroatom, heterocyclic systems fused to benzene ring like quinolone, indoles and others. Practical experiments that allow students to master the synthetic methodology related to drug synthesis and process chemistry. Therefore, the students will be trained on the synthesis, purification, separation and analysis of organic compounds in six different experiments.

Prerequisite: 1101214.

1102321 Pharmacology 1A

2-3:3

Introduction to pharmacology, general aspects of pharmacodynamics and pharmacokinetics, the pharmacological actions and therapeutic uses of drugs acting on the sympathetic and parasympathetic divisions of the autonomic nervous system, the therapeutically useful neuromuscular blocking drugs and the respiratory system. In studying therapeutic agents, emphasis is made on their pharmacokinetics, mechanisms of action, therapeutic indications, adverse effects, and contraindications. Practical classes using in vitro and in vivo experiments related to autonomic nervous system and formulation of parenteral.

Prerequisite: 1102214; Co-requisite: 1102231.

1102351 Pharmacognosy

3-3:4

The course will provide a brief historical description for the emergence of Pharmacognosy as a standalone branch of Pharmaceutical Science. The aim of this course is to provide Pharmacy students with a descriptive knowledge of drugs from natural sources including chemical and pharmacological properties. The mostly used natural drugs worldwide will be described in details including their discovery, folkloric use, pharmacological actions, their development for the market use and their published research and clinical studies including their latest news. Taxonomic and chemotaxonomic classification of natural drugs will be taught.

Prerequisite: None.

1104352 Pharmacy Management

2-0:2

Principles and components of pharmacy management are covered in this course. Management topics covered include general operations; personnel and human resource; financial and business, goods and merchandizing; value- added services; medicine safety, prevention of medication errors and risk management. Conditions and factors relevant to employment; working effectively within an organization; planning of pharmacy services and resources; safety in the work environment are detailed in this course.

Prerequisite: 1104351.

1102322 Pharmacology IB

2-3:3

Renal physiology, diuretics and Pharmacotherapeutics of gout. Physiological consideration of the cardiovascular system. Pharmacotherapeutics of arrhythmias, hypertension, congestive heart failure, and angina. Drug treatment of hyperlipidemia, and anemia. Drugs affecting blood.

Practical classes using in vitro and in vivo experiments and also tutorial classes.

Prerequisite: 1102321.

1101312 Medicinal Chemistry IIB

2-3:3

This course aims to introduce students to concrete knowledge about medicinal Chemistry, drug-enzyme and drug- receptor interactions including the design and types of agonists, antagonists, inverse agonists and partial agonists, types of inhibitors, qualitative structure activity relationships. Qualitative, quantitative structure-activity relationships (QSAR). Case studies in relation to qualitative and quantitative optimization of lead molecules. The medicinal chemistry aspects of metabolic biotransformation of drugs are covered in this course. Furthermore, providing information on the medicinal chemistry of adrenergic, cholinergic CNS. This course is also encompassing practical experiments that are related to the synthesis, purification, analysis and identification of anti-bacterial agents, beta-blockers, sulfa drugs, penicillin...etc. Furthermore, the students are also exposed to entry level computer-aided modeling, 2D and 3D drawings as well as physicochemical calculations.

Prerequisite: 1101311.

1103312 Pharmaceutics 1B

2-3:3

The course discusses topics related to solid dosage forms in terms of their production, manufacturing methods, machinery and evaluation of the final product. The general topics covered in this course include: powders and granules, hard and soft gelatin capsules and tablets.

Prerequisite: 1103311.

1102341 Pharmaceutical Microbiology II**2-3:3**

Pharmaceutical microbiology II course includes many topics ranging from the manufacture and quality control of pharmaceutical products to an understanding of the contribution of chemical disinfectants, antiseptics and preservatives in contamination and infection control as well as the wide contribution of microbiology in pharmaceutical sciences. Practical classes are related to the preparation of sterile pharmaceutical products.

Prerequisite: 1102241.

1104451 Drug literature Evaluation and Pharmacoeconomics**3-0:3**

Drug Information / Literature Evaluation. Sources of drug information, internet searching, study and research design and bio-statistical analysis are concepts covered in this course. An introduction to Pharmacoepidemiology and Pharmacoeconomics including cost determination and analysis (cost-benefit, cost-effectiveness, cost-utility, cost minimizations and cost-of-illness) is covered. Health-related quality of life analysis is also included.

Prerequisite: 1104352.

1101411 Medicinal Chemistry IIIA**3-0:3**

This course covers the medicinal chemistry aspects of, antipsychotics, antiparkinsons, narcotic and non-narcotic drugs, antidepressants, psychotropic agents, antidiabetic agents, antiarrhythmic agents, antianginal agents as well as ACE-inhibitors. The structure activity relationship, metabolism, synthesis and biochemical mechanism of action of each class is discussed.

Prerequisite: 1101312.

1103411 Pharmaceutics IIA**2-3:3**

This course introduces students to the concepts of pharmacokinetics and biopharmaceutics. Students cover structure of membranes and drug movement across membranes, distribution and absorption mechanisms and formulation factors affecting physiological outcomes in terms of bioavailability and drug product selection. The general topics covered in this course include: Pharmacokinetics of IV and extravascular administrations; Compartmental PK modeling; Multiple dosing kinetics; Hepatic and renal clearance; Bioequivalence. Prerequisite: 1103312

1102421 Pharmacology IIA**2-3:3**

The course focuses on CNS and covers physiological aspects and neurochemistry of the brain, movement disorders, and pharmacotherapeutics of Parkinson's disease, epilepsy, psychoses, depression, anxiety, autacoids and treatment of migraine, sleep disorders, and appetite disorders. General and local anesthesia, physiology and management of pain. Opioid analgesics and non-steroidal anti-inflammatory drugs. The pharmacology of alcohol, drug abuse and drug dependence. The course also includes practical classes using in vitro and in vivo experiments to illustrate some of the theoretical aspects and also tutorial classes to interactively revise the various topics covered in theory classes.

Prerequisite: 1102321.

1104421 Clinical Pharmacy IA

3-0:3

Topics covered in general are: Approach to clinical pharmacy, introduction to laboratory data, electrolyte homeostasis, arterial blood gases, drug use in pregnancy and breastfeeding, topics in child health. Disease states include respiratory disorders such as asthma, COPD and cystic fibrosis. Cardiovascular disorders such as hypertension, coronary heart disease, heart failure and arrhythmias.

Prerequisite: 1102322

1104452 Principles of Over the Counter (OTC) Therapy

3-0:3

OTC pharmacy and primary health care, the role of the pharmacist in responding to symptoms and helping patients' self-care as an essential contribution to good health is covered in this course. Topics include: eye lid disorders, ear problems, nausea and vomiting, constipation and hemorrhoids, diarrhea, cold and flu, fever and pain, analgesics, Eczema, Acne, allergic rhinitis, dermatitis, contraception, smoking cessation, vitamins and supplements.

Prerequisite: 1104451

1101412 Medicinal Chemistry IIIB

3-0:3

This course discusses the important medicinal chemistry aspects of chemotherapeutic agents: anticancer, antibacterial agents, antifungal, antiviral agents. Drugs affecting the hormones like steroid, thyroid hormones, prostaglandins and non-steroidal anti-inflammatory agents. The focus will be on structure activity relationships, synthesis, metabolism, and biochemical mechanism of action.

Prerequisite: 1101312

1103412 Pharmaceutics IIB

2-3:3

This course aims to provide students with the fundamental knowledge required assess drug product stability including the kinetics and pathways of drug degradation, factors affecting the rate of decomposition of pharmaceutical products and methods used for determination of shelf-life. It also addresses the topic of preparation and characterization of sterile parenteral dosage forms. General topics covered in this course also include: Kinetics of chemical reaction, determination of drug stability and formulation and quality control of sterile products for injection.

Prerequisite: 1103411

1102422 Pharmacology IIB

2-3:3

Drugs affecting endocrine system including the anti-inflammatory adreno-corticosteroids, and drugs affecting calcium metabolism emphasizing the role of parathyroid hormone, vitamin D and Calcitonin in regulation of calcium. Pharmacotherapeutics of diabetes mellitus including insulin and oral hypoglycemic agents. Drugs used in the management of thyroid gland disorders. Gonadal hormones and hormonal contraceptives and their antagonists. Drugs acting on uterus. Drugs used in gastro-intestinal disorders including pharmacotherapeutics of peptic ulcer, diarrhea, constipation and emesis. Tutorial classes and seminars to interactively revise the various theoretical topics.

Prerequisite: 1102321; 1102231

1104422 Clinical Pharmacy IB

3-0:3

Topics covered in general are: Geriatrics, musculoskeletal disorders such as rheumatoid arthritis, gout, and osteoarthritis, clinical pharmacokinetics of commonly used drugs, common eye disorders including glaucoma. Endocrine diseases such as parathyroid, thyroid, diabetes, Cushing's disease, etc...) will also be covered. Infectious disease such as respiratory, skin, bone and soft tissue, Urogenital, CNS) will also be covered.

Prerequisite: 1104421

1104453 Law and Ethics

2-0:2

The course will cover ethical principles and codes that govern the practice of pharmacy and medicine in patient care; the different ethical issues pharmacists encounter in daily pharmacy practice; competency of pharmacists and standards of practice expected to be met by regulatory and licensing bodies locally and internationally; the laws and regulations governing pharmacy practice and drug control in the UAE.

Prerequisite: 1104451.

1104522 Clinical Pharmacy II B

3-0:3

Topics covered in general are: Oncology-principles of chemotherapeutic agents. Psychiatry (depression, anxiety, bi- polar disease, manic-depressive disorder, schizophrenia). Drug abuse and Harm reduction. Transplant issues, Clinical toxicology. Palliative and end-of life supportive care. Acute and chronic renal diseases.

Prerequisite: 1104422; Co-requisite: 1104521

1103511 Pharmaceutics III

3-0:3

The course covers topics related to novel drug delivery systems. The course focuses on the novel aspects in drug formulation designs such as prodrugs, drug delivery by different routes of administration such as per oral, transdermal, ocular, vaginal, and parenteral; and the development of new drug delivery systems such as microencapsulation, liposomes and drug-loaded resealed erythrocytes. The course also discusses the pharmaceutical applications of biotechnology and methods used in delivery of peptides and proteins and therapeutic genes.

Prerequisite: 1103412.

1102521 Pharmacology III

3-0:3

General aspects and mechanisms of action of chemotherapeutic agents and development of resistance. Inhibitors of cell wall synthesis, penicillins, cephalosporins, monobactams and vancomycin. Drugs inhibiting protein synthesis, aminoglycosides, tetracyclines, erythromycin and chloramphenicol. Inhibitors of DNA gyrase, quinolones and inhibitors of RNA polymerase rifampicin. Inhibitors of folic acid synthesis metabolism, trimethoprim and sulfonamides.

Antifungal, ant tubercular and antileprosy. Anti-viral agents. Cancer chemotherapy. Prerequisite: 1102321 and 1102341.

1104521 Clinical Pharmacy II A

3-0:3

Topics covered in general are: Nutrition (enteral, parenteral feeding). Dermatology (common skin conditions, psoriasis). Hematology (anemia, coagulation disorders). Gastrointestinal diseases (PUD, liver disease, IBS, IBD). Neurology (stroke, migraine, epilepsy).

Prerequisite: 1104422 Co-requisite: 1104522.

1104551 Professional Experiential Placement A

0-24:8

The Professional Experiential Placement A (PEP-A) provides B. pharm students a structured, supervised program of participation in the practice of pharmacy. Students gain experience in problem solving and providing patient care services while applying the basic and pharmaceutical sciences learned in the classroom and practice laboratories. Under the supervision of faculty and selected preceptors, the student learns to make decisions based on professional knowledge and judgment. Broad exposure to as many pharmacy activities as possible, as well as significant personal study and reflection, facilitate this transition.

Prerequisites: 1104451, 1104452 and 1104453, Co-requisite: 1104552.

1104552 Professional Experiential Placement B

0-24:8

The Professional Experiential Placement B (PEP-B) provides B. pharm students a structured, supervised program of participation in the practice of pharmacy. Students gain experience in problem solving and providing patient care services while applying the basic and pharmaceutical sciences learned in the classroom and practice laboratories. Under the supervision of faculty and selected preceptors, the student learns to make decisions based on professional knowledge and judgment. Broad exposure to as many pharmacy activities as possible, as well as significant personal study and reflection, facilitate this transition.

Prerequisites: 1104451, 1104452, and 1104453; Co-requisite: 1104551.

1101521 Drug Development

3-0:3

This subject will provide students with an appreciation of the steps taken to develop a molecule into a pharmaceutical product. The purpose of this course is to provide a current and modern overview relevant to drug development process including Measures used in target and drug validation, lead identification through high throughput screening, combinatorial chemistry, parallel synthesis and natural products. Pharmacology and toxicity of drug candidates, phases in drug development, ethical issues related to different phases, patenting, registration, marketing and post marketing studies.

Prerequisite: offered only to 4th and 5th Year students

1105512 Graduation Project

4-0:4

This course provides the students with skills needed to deal with a scientific problem and how to solve it (or write a review article with updated information about a specific problem). It consists of a literature review, the proper use of equipment and instruments, performing an experiment that deals with the research topic, analyzing the data obtained from the experiments, writing the

dissertation and presenting a seminar about the work which is evaluated by faculty members.
Prerequisite: offered only for fifth-year students.

Special Topics in Pharmacy

1102561

Toxicology

2-3:3

This course deals with poisons that cause harmful effects to the living organism. This includes the following items: study the source of poisons or toxic agent, its absorption, distribution, as well as its metabolism. Classification of toxic agents according to the target organs that may be affected by these toxicants Examination of chemical toxicant according to exposure or specific use categories. Accordingly, it deals with toxicant found in air, soil, water, food, and the work place as well, chemicals encountered in specific use categories such as pesticides, drugs, and solvent. Prerequisite: None

1103521

Pharmaceutical Technology and Dosage Forms

3-0:3

This course provides the students with the recent and more advanced pharmaceutical technology. Dosage forms studied during this course including the following: Sustained release technology, therapeutic rate controlling delivery system, ambulatory infusion devices, solubilization technology, including: cyclodextrin inclusion complexes and supercritical fluids. Packaging technology and sterilization and Good Manufacturing Practice (GMP). Prerequisite: None

1101522

Analytical Methods of Nutraceuticals and Food Additives

**2-
1:3**

This course introduces students to the main instrumental methods used for the separation, identification and quantification of pharmaceutical products. The course addresses both the theoretical and practical aspects of UV-Visible Spectroscopy, Liquid Chromatography, Gas Chromatography and Mass Spectrometry. It covers also the criteria used for the validation of analytical methods. Experimental laboratories will be included. Prerequisite: None

1103221

Cosmetics and Para-pharmaceuticals

3-0:3

The course is designed to provide the students with the knowledge of the science and technology behind the production of cosmetic and personal care products. Theoretical lectures will focus on the cosmetic ingredients and active substances and the technology used in formulation and characterization of cosmetic products. Cosmetic GMP standards and requirements for optimal and sustainable quality control and management will be also covered as the quality and safety of these products used in our daily routine is essential for human safety. Prerequisite: None

1104532

Therapeutic Drug Monitoring (TDM)

3-0:3

This course TMD, specifically, is a practice applied to a small group of drugs in which there is a direct relation between serum drug concentration and pharmacological response, as well as a narrow therapeutic range and for which serum drug concentrations are used in conjunction with other measures of clinical observation to assess patient status.

The student should learn how to use serum drug concentrations, Pharmacokinetics and pharmacodynamics to individualize and optimize patient responses to drug therapy by maintaining serum drug concentration within therapeutic range above which drug induced toxicity occurs too after and below which the drug is too after ineffective. Prerequisite: None

1103241 Quality Control

3-0:3

This course exposes the students to the current good manufacturing practice techniques of quality control of the following: the injections, solutions, suspension, emulsions, suppositories, topical preparations, transdermal therapeutic system, aerosols, and tablets. Packaging and labeling control, holding and distribution and laboratory control are to be studied. The current good manufacturing practice (CGMP) of Building and Facilities as well as, Sterile and aseptic manufacturing facilities and design. Prerequisite: None

1103222 Biopharmaceutical Technology

3-0:3

This course is designed to provide student with the basic information about enzymes, their production, immobilization technology and its application and fermentation; covering general consideration to industrial applications. Basic genetics is given to prime up the existing familiarity and knowledge in this rapidly expanding science, recombinant - DNA technology where gene engineering, cloning and expression as well as various applications are also discussed. Prerequisite: None

1104531 Drug Information

2-3:3

The purpose of this course is to provide a current comprehensive overview of relevant information and concepts for students and pharmacists involved in providing drug information and evaluating scientific literature in the patient care setting. Prerequisite: None.