جامعة عمان العربية
AMMAN ARAB UNIVERSITY

College of Pharmacy

Department of Pharmacy.

Study Plan of the Bachelor's Degree

In: Pharmacy

Academic Year: 2021/2022

Study Plan Credit hours(160) Type of Program: **Blended/ Online**

Major Type: ☐Humanities ☐Scientific/Technical √Science Medical

Teaching Type	Percentage of study plan hours/number	Actual Ratio
Complete Online E-Learning	20% - 10% Maximum	17% (27/160)
Blended learning (for scientific majors)	50% - 30% Maximum	45% (72/160)
Face-to-face learning (for scientific majors)	30% Minimum	38% (61/160)

Note: The learning types of the courses are disseminated at all academic levels in the program

Department Vision

Entrepreneurship and distinction in pharmaceutical sciences, academically and professionally, at the local, regional, and international levels.

Department Mission

Preparing pharmaceutical cadres supported by the knowledge, skills, and ethics of the profession, to meet the needs of the local, regional and global community, by local and international quality criteria.

Program Mission

Providing distinguished academic programs supported by the knowledge, skills, and ethics of the profession through qualified cadres capable of keeping pace with the local and approved e-learning criteria.

Educational Program Objectives

1. Providing advanced and distinguished education to graduate professionally and research-qualified pharmacists.
2. Preparing students with the skills of pharmacists work in line with the labor market and the needs of society.
3. Encouraging scientific research, the appropriate atmosphere for conducting it, and developing it.
4. Serving public and private civil society institutions, especially those working in the pharmaceutical field.

Educational Program Outcomes

1. Develop, integrate, and apply knowledge from the foundational sciences (i.e., pharmaceutical, social/behavioral/administrative, health, and clinical sciences) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and patient-centered care.
2. Provide patient-centered care as the medication expert (collect and interpret evidence, prioritize, formulate assessments and recommendations, foster patient support and empowerment, implement, monitor and adjust plans, and document activities).
3. Manage patient healthcare needs using human, financial, technological, and physical resources to optimize the safety and efficacy of medication use systems.

4. Design prevention, intervention, and educational strategies for individuals and communities to manage disease and improve health and wellness.
5. Describe the way in which population-based care influences patient-centered care and influences the development of practice guidelines and evidence-based best practices.
6. Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.
7. Educate all audiences by determining the most effective and enduring ways to impart information and assess understanding.
8. Assure that patients' best interests are represented.
9. Actively participate and engage as a healthcare team member by demonstrating mutual respect, understanding, and values to meet patient care needs.
10. Recognize social determinants of health to diminish disparities and inequities in access to quality care.
11. Effectively communicate verbally and nonverbally when interacting with an individual, group, or organization.
12. Examine and reflect on personal knowledge, skills, abilities, beliefs, biases, motivation, and emotions that could enhance or limit personal and professional growth.
13. Demonstrate responsibility for creating and achieving shared goals, regardless of position.
14. Engage in innovative activities by using creative thinking to envision better ways of accomplishing professional goals.
15. Exhibit behaviors and values that are consistent with the trust given to the profession by patients, other healthcare providers, and society.

Plan Contents

The study plan for a bachelor's degree consists of a major in Pharmacy Of (160) credit hours disseminated as follows:

Sequence	Classification	Credit Hours	Percent %
1st	University Requirements	27	17%
2nd	College Requirements	26	16%
3rd	Program Requirements	107	67%
Total		160	100%

Coding System Approved by the University

		Semester	year			0	1	7
Sequence		Course Level		Knowledge domain		Major Code		College Code

Knowledge Domain

Credited Hours of Study Plan	Knowledge Domain	Domain Code
46	Foundational Knowledge	1
41	Essentials for Practice and Care	2
12	Approach for Practice and Care	3
6	Personal and Professional Development	4
19	Pharmaceutical Product Expert	5

First: University Requirements: (27) Credit Hours

A. Compulsory Requirements: (18)Credit Hours

Teaching type			Course Number	Course Title	Credited Hours	Pre-Requisite
Online E-Learning	Blended	Face-to-Face				
√			50511104	Communication and Communication Skills 1 (Arabic)	3	((Pre) 50511108)
√			50511105	Communication and Communication Skills 1 (English)	3	((Pre) 50511109)
√			50511108	Remedial Course in Arabic	0	
√			50511109	Remedial Course in English	0	
√			50511110	Remedial Course in Computer Science	0	
√			50511205	Life Skills and Social Responsibility	3	
√			50511206	National Education	3	
√			50511305	Leadership and Innovation	3	
√			50511308	Military Sciences	3	
			Total			

B. Elective Requirements: (9)Credit Hours from the following list:

Teaching type			Course Number	Course Title	Credited Hours	Pre-Requisite
Online E-Learning	Blended	Face-to-Face				
√			50521106	Communication and Communication Skills 2 (Arabic)	3	((Pre) 50511104)
√			50521107	Communication and Communication Skills 2 (English)	3	((Pre) 50511105)
√			50521203	Principles of Psychology	3	
√			50521204	Human Rights	3	
√			50531101	Islamic Culture	3	
√			50531205	Quds and Hashemite Custodianship	3	
√			50541103	Computer Skills	3	((Pre) 50511110)

Teaching type			Course Number	Course Title	Credited Hours	Pre-Requisite
Online E-Learning	Blended	Face-to-Face				
√			50541204	Development and Environment	3	
√			50541206	Health and Community	3	
√			50541308	Foreign Language	3	
√			50541309	Digital Culture	3	((Pre) 50511110)
			Total		9	

Second: College Requirements: (26) Credit Hours

A. **Compulsory Requirements:** (26) Credit Hours

Teaching type			Course Number	Course Title	Credited Hours	Pre-Requisite
Online E-Learning	Blended	Face-to-Face				
	√		70113229	Immunology	3	Pharmaceutical Microbiology 70113121
	√		70134139	Pharmaceutical Legislation and Ethics	1	Pharmacology (3) 70123232
		√	70111106	Organic Chemistry	3	-
		√	70111208	Pharmaceutical Analytical Chemistry and Instrumental Analysis	3	General Chemistry 50551103
		√	70111209	Pharmaceutical Analytical Chemistry and Instrumental Analysis Practical	1	(Co- Requisite) Pharmaceutical Analytical Chemistry and Instrumental Analysis 70111208
		√	50551103	General Chemistry	3	-
	√		50551107	General Biology	3	-
	√		70111105	Anatomy and Histology	2	-
	√		70111210	Physiology	3	Anatomy and Histology 70111105
		√	70111211	Physiology Practical	1	(Co- Requisite) Physiology

						70111210
	√		70112112	Pathophysiology	3	Physiology 70111210
			Total		26	

Third: **Program Requirements** (107) Credit Hours

A. **Compulsory Requirements:** (98) Credit Hours

Teaching type			Course Number	Course Title	Credited Hours*	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
		√	70112215	Medicinal Chemistry (1)	3	3	-	Pharmaceutical Organic Chemistry 70111265
		√	70111265	Pharmaceutical Organic Chemistry	3	3	-	Organic Chemistry 70111106
		√	70112113	Physical Pharmacy	2	2	-	General Chemistry 50551103
		√	70112114	Physical Pharmacy Practical	1	-	2	(Co- Requisite) Physical Pharmacy 70112113
	√		70112111	Biochemistry	2	2	-	General Chemistry 50551103
	√		70112110	Pharmacognosy and Phytochemistry	3	3	-	Pharmaceutical Organic Chemistry 70111265
	√		70122216	Clinical Biochemistry	3	3	-	Biochemistry 70112111
		√	70113125	Medicinal Chemistry (2)	2	2	-	Medicinal Chemistry (1) 70112215
		√	70113126	Medicinal Chemistry (2) Practical	1	-	2	Medicinal Chemistry (2) 70113125

Teaching type			Course Number	Course Title	Credited Hours*	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
		√	70113230	Medicinal Chemistry (3)	2	2	-	Medicinal Chemistry (2) 70113125
	√		70154244	Cosmetics	2	2	-	Pharmaceutics 70153227
	√		70123231	Biopharmaceutics	2	2	-	Physical Pharmacy 70112113
		√	70124133	Pharmacokinetics	3	3	-	Pharmacology (2) 70123122
		√	70124134	Pharmacokinetics Practical	1	-	2	(Co- Requisite) Pharmacokinetics 70124133
	√		70155150	Industrial pharmacy	3	3	-	Biopharmaceutics 70123231
		√	70155151	Industrial Pharmacy Practical	1	-	2	(Co- Requisite) Industrial pharmacy 70155150
	√		70135146	Pharmacoeconomics	2	2	-	Pharmacology (3) 70123232
	√		70135255	Pharmaceutical Marketing	2	2	-	Pharmacoeconomics 70135146
	√		70112217	Microbiology	2	2	-	Anatomy and Histology 70111105
		√	70122218	Pharmacology (1)	3	3	-	Phathophysiology 70112112
		√	70123122	Pharmacology (2)	3	3	-	Pharmacology (1) 70122218
		√	70123123	Pharmacology (2) Practical	1	-	2	(Co- Requisite) Pharmacology (2) 70123122
	√		70113121	Pharmaceutical Microbiology	3	3	-	Microbiology 70112217
		√	70124135	Clinical Pharmacy and Therapeutics (1)	3	3	-	Pharmacology (3) 70123232

Teaching type			Course Number	Course Title	Credited Hours*	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
	√		70123232	Pharmacology (3)	3	3	-	Pharmacology (2) 70123122
		√	70144266	Pharmaceutical Field Training (1)	2	-	4	Virtual Pharmacy 70144165
		√	70145267	Pharmaceutical Field Training (2)	2	-	4	Pharmaceutical Field Training (1) 70144266
		√	70144165	Virtual Pharmacy	2	-	4	Successfully Complete 90 CH
	√		70124243	Toxicology	2	2	-	Pharmacology (3) 70123232
	√		70125145	Over the Counter Drugs (OTC)	2	2	-	Pharmacology (3) 70123232
		√	70125147	Clinical Pharmacy and Therapeutics (2)	3	3	-	Clinical Pharmacy and Therapeutics (1) 70124135
	√		70123124	Medicinal Phytotheraphy	3	3	-	Pharmacognosy and Phytochemistry 70112110
	√		70154242	Pharmaceutical Biotechnology	3	3	-	Immunotherapy 70124138
		√	70155256	Pharmaceutical Technology	3	3	-	Industrial Pharmacy 70155150
	√		70152219	Pharmaceutical Calculation and Compounding of Dosage Forms	3	3	-	Physical Pharmacy 70112113
		√	70152220	Pharmaceutical Calculation and Compounding of Dosage Forms Practical	1	-	2	(Co-Requisite) Pharmaceutical Calculation and Compounding of Dosage Forms 70152219

Teaching type			Course Number	Course Title	Credited Hours*	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
		√	70134241	Pharmacy Practice Lab (1)	1	-	2	Pharmaceutics 70153227
		√	70135254	Pharmacy Practice Lab (2)	1	-	2	Industrial pharmacy 70155150
		√	70134136	Clinical Cases (1)	1	-	2	(Co- Requisite) Clinical Pharmacy and Therapeutics (1) 70124135
		√	70135148	Clinical Cases (2)	1	-	2	(Co- Requisite) Clinical Pharmacy and Therapeutics (2) 70125147
		√	70125253	Clinical Pharmacy and Therapeutics (3)	3	3	-	Clinical Pharmacy and Therapeutics (2) 70125147
	√		70153227	Pharmaceutics	2	2	-	Pharmaceutical Calculation and Compounding of Dosage Forms 70152219
		√	70153228	Pharmaceutics Practical	1	-	2	(Co- Requisite) Pharmaceutics 70153227
	√		70135149	Gene Therapy	3	3	-	Pharmaceutical Biotechnology 70154242
	√		70124138	Immunotherapy	3	3	-	Immunology 70113229
			Total		98			

* **Credit Hours**

B. **Elective Requirements:** (9) Credit Hours

Teaching type			Course Number	Course Title	Credited Hours*	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
	√		70125157	Pharmacoepidemiology	3	3	-	Clinical Pharmacy and Therapeutics (1) 70124135
	√		70145158	Research Project	3	3	-	Successfully Complete 120 CH)
	√		70155159	Genetic Engineering	3	3	-	Immunotherapy 70124138
	√		70155160	Drug Delivery Systems	3	3	-	Pharmacokinetics 70124133
	√		70115261	Biostatistics	3	3	-	-
	√		70155262	Drug Design	3	3	-	Medicinal Chemistry (3) 70113230
	√		70115263	Poisonous and Hallucinogenic Plants	3	3	-	Medicinal Phytotherapy 70123124
	√		70115264	First Aid	3	3	-	-
	√		70115265	Special topics	3	3	-	-
			Total		9	9	-	

* **Credit Hours**

Guidance plan

First Year

First Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
50551103	General Chemistry	Face to face	3	-	-
50551107	General Biology	Blended	3	-	-
70111105	Anatomy and Histology	Blended	2	-	
70111106	Organic Chemistry	Face to face	3	-	General Chemistry
-	University Requirement	Online	3	-	-
-	University Requirement	Online	3	-	-
Total			17		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
70111208	Pharmaceutical Analytical Chemistry and Instrumental Analysis	Face to face	3	General Chemistry 50551103	-
70111209	Pharmaceutical Analytical Chemistry and Instrumental Analysis Practical	Face to face	1	-	Pharmaceutical Analytical Chemistry and Instrumental Analysis 70111208
70111265	Pharmaceutical Organic Chemistry	Face to face	3	Organic Chemistry 70111106	-
70111210	Physiology	Blended	3	Anatomy and Histology 70111105	-
70111211	Physiology Practical	Face to face	1	-	Physiology 70111210
-	University Requirement	Online	3	-	
-	University Requirement	Online	3	-	
Total			17		

Second Year					
First Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
70112113	Physical Pharmacy	Face to face	2	Pharmaceutical Analytical Chemistry and Instrumental Analysis 70111208	-
70112114	Physical Pharmacy Practical	Face to face	1	-	Physical Pharmacy 70112113
70112110	Pharmacognosy and phytochemistry	Blended	3	Pharmaceutical Organic Chemistry 70111265	-
70112111	Biochemistry	Blended	2	General Chemistry 50551103	-
70112112	Pathophysiology	Blended	3	Physiology 70111210	-
-	University Requirement	Online	3	-	
Total			**14**		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
70152219	Pharmaceutical Calculation and Compounding of Dosage Forms	Blended	3	Physical Pharmacy 70112113	-
70152220	Pharmaceutical Calculation and Compounding of Dosage Forms Practical	Face to face	1	-	Pharmaceutical Calculation and Compounding of Dosage Forms practical 70152219

70112215	Medicinal Chemistry (1)	Face to face	3	Pharmaceutical Organic Chemistry 70111265	-
70122216	Clinical Biochemistry	Blended	3	Biochemistry 70112111	-
70112217	Microbiology	Blended	2	Anatomy and Histology 70111105	-
70122218	Pharmacology (1)	Face to face	3	Pathophysiology 70112112	-
Total			**15**		

* **Credit Hours**

Third Year

First Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
70113125	Medicinal Chemistry (2)	Face to face	2	Medicinal Chemistry (1) 70112215	-
70113126	Medicinal Chemistry (2) Practical	Face to face	1	-	Medicinal Chemistry (2) 70113125
70113121	Pharmaceutical Microbiology	Blended	3	Microbiology 70112217	-
70123122	Pharmacology (2)	Face to face	3	Pharmacology (1) 70122218	-
70123123	Pharmacology (2) Practical	Face to face	1	-	Pharmacology (2) 70123122
70123124	Medicinal Phytotherapy	Blended	3	Pharmacognosy and phytochemistry 70112110	-
-	University Requirement	Online	3	-	-
Total			**16**		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
70123231	Biopharmaceutics	Blended	2	Physical Pharmacy 70112113	-
70113230	Medicinal Chemistry (3)	Face to face	2	Medicinal Chemistry (2) 70113125	-
70113229	Immunology	Blended	3	Pharmaceutical Microbiology 70113121	-
70123232	Pharmacology (3)	Blended	3	Pharmacology (2) 70123122	-
70153227	Pharmaceutics	Blended	2	Pharmaceutical Calculation and Compounding of Dosage Forms 70152219	-
70153228	Pharmaceutics Practical	Face to face	1	-	Pharmaceutics 70153227
-	University Requirement	Online	3	-	-
Total			**16**		

* **Credit Hours**

Fourth Year

First Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
70124133	Pharmacokinetics	Face to face	3	Pharmacology (2) 70123122	-
70124134	Pharmacokinetics Practical	Face to face	1	-	Pharmacokinetics 70124133
70124138	Immunotherapy	Blended	3	Immunology 70113238	-
70134139	Pharmaceutical Legislation and Ethics	Blended	1	Pharmacology (3) 70123232	-
70124135	Clinical Pharmacy and Therapeutics (1)	Face to face	3	Pharmacology (3) 70123232	-

70144165	Virtual Pharmacy	Face to face	2	Successfully Complete 90 CH	-
70134136	Clinical Cases (I)	Face to face	1	-	Clinical Pharmacy and Therapeutics (I) 70124135
-	University Requirement	Online	3	-	-
Total			**17**		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
70154242	Pharmaceutical Biotechnology	Blended	3	Immunotherapy 70124138	-
70124243	Toxicology	Blended	2	Pharmacology (3) 70123232	-
70154244	Cosmetics	Blended	2	Pharmaceutics 70153227	-
70144266	Pharmaceutical Field Training (I)	Face to face	2	Virtual pharmacy 70144165	-
70134241	Pharmacy Practice Lab (I)	Face to face	1	Pharmaceutics 70153227	-
-	Department Elective		3	-	-
Total			**13**		

* **Credit Hours**

Fifth Year

First Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
70155150	Industrial pharmacy	Blended	3	Pharmacy practice lab I 70134241	-
70155151	Industrial Pharmacy Practical	Face to face	1	-	Industrial pharmacy 70155150
70135146	Pharmacoeconomics	Blended	2	Pharmacology (3) 70123232	-
70125147	Clinical Pharmacy and Therapeutics (2)	Face to face	3	Clinical Pharmacy and Therapeutics (I) 70124135	-
70135148	Clinical Cases (2)	Face to face	1	-	Clinical Pharmacy and Therapeutics (2) 70125147
70135149	Gene Therapy	Blended	3	Pharmaceutical Biotechnology 70154242	-
70125145	Over the Counter Drugs (OTC)	Blended	2	Pharmacology (3) 70123232	-
-	Department Elective		3	-	-
Total			**18**		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
70135255	Pharmaceutical Marketing	Blended	2	Pharmacoeconomics 70135146	-
70155256	Pharmaceutical Technology	Face to face	3	Industrial pharmacy 70155150	-
70125253	Clinical Pharmacy and Therapeutics (3)	Face to face	3	Clinical Pharmacy and Therapeutics (2) 70125147	-
70135254	Pharmacy Practice Lab (2)	Face to face	1	Industrial pharmacy	-
70145267	Pharmaceutical Field Training (2)	Face to face	2	Pharmaceutical Field Training (1) 70144266	-

-	University Requirement		3	-	-
-	Department Elective		3	-	-
Total			**17**		

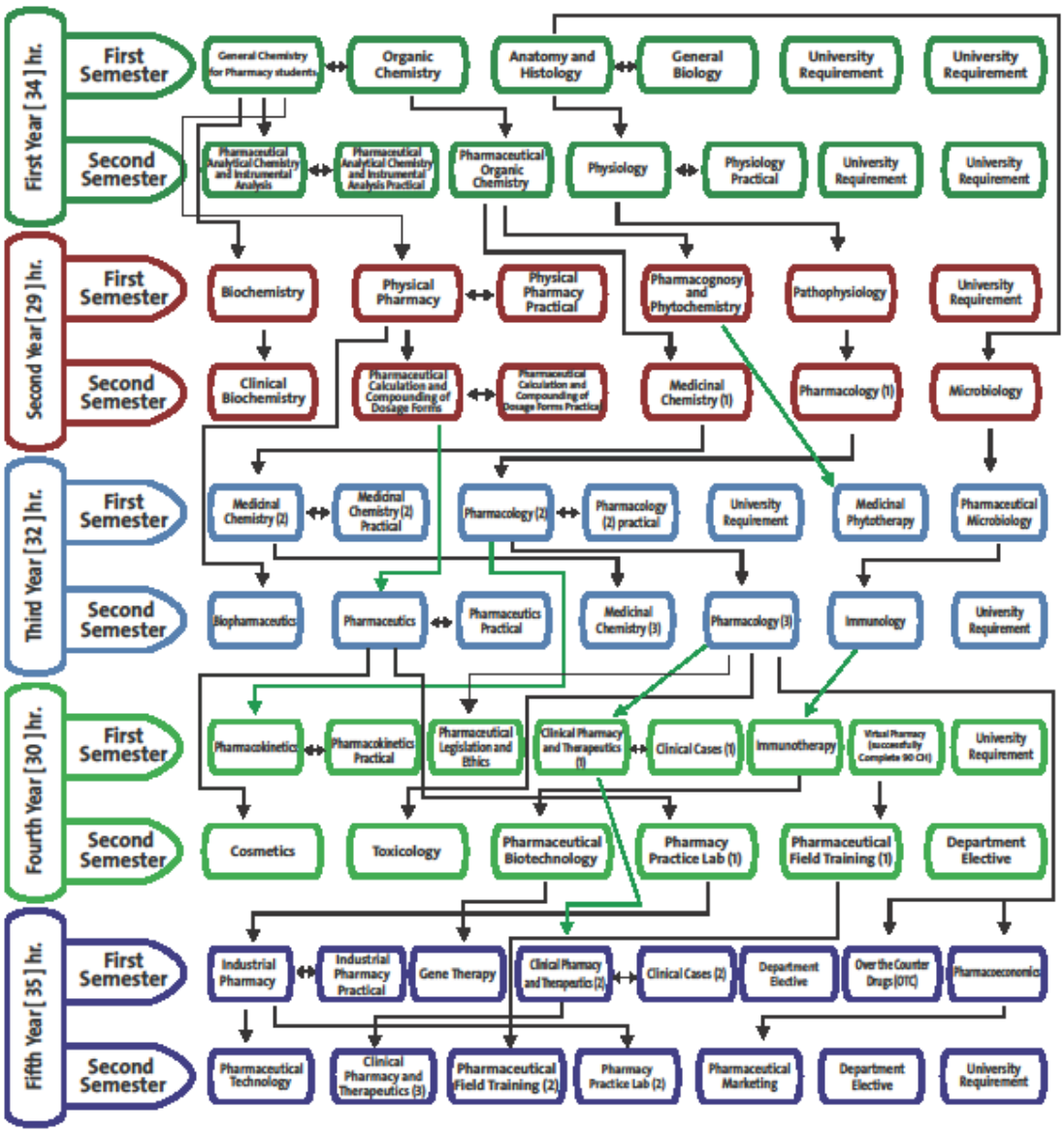
جامعة عمان العربية AMMAN ARAB UNIVERSITY

Faculty of Pharmacy كلية الصيدلة

Courses Tree

Faculty: Pharmacy **Department: Pharmacy**

Major: Pharmacy **Program: Bachelor** **Issue Date: 2021/2022**



Course Description

50551103 General Chemistry (No prerequisite) (3 Credit Hours) (Face to Face)

This course covers the following topics: Scientific Measurements; The Component of Matter; Stoichiometry of Formulas and Equations; Three Major Classes of Chemical Reactions; Gases and the Kinetic-Molecular Theory; Equilibrium - The Extent of Chemical Reactions; Kinetics- Rates and Mechanisms of Chemical Reactions.

50551107 General Biology (No prerequisite) (3 Credit Hours) (Blended)

This course introduces the principles and concepts of biology as a vital subject for pharmacy & Medical Sciences students. Emphasis is on basic biological chemistry, Cell structure and function, Metabolism and Energy transformation, Genetics, Gene expression, Viruses, Biotechnology, Classification and Phylogeny, Bacteria and Archaea, Protists, Plant diversity, Vascular Plants structure and function, Animal diversity, and other related topics. Upon completion, students should be able to demonstrate understanding of life at the molecular and cellular levels.

70111106 Organic Chemistry (No-prerequisite) (3 Credit Hours) (face to face)

This course will subject the student to the molecular orbital theory of organic compounds; Principles of the IUPAC nomenclature of organic compounds; Chemistry of Alkanes, Cycloalkanes, Alkenes and Alkynes; Alkyl halides: Nucleophilic Substitutions and Eliminations, Stereochemistry; Benzene and Aromaticity.

70111105 Anatomy and Histology (No-prerequisite) (3 Credit Hours) (Blended)

Anatomy and Histology course represents fundamental foundational science for pharmacy students. Histology involves the examination of normal microscopic structures, as well as ultra-structures and their associated functions. Conversely, Anatomy concentrates on the overall physical characteristics of the organs that compose the human body's systems. During classroom lectures, students will gain a comprehensive understanding of the morphology and interrelationships among anatomical structures found in humans and the histological tissues that constitute these structures. Emphasis is placed on illustrating the connection between the specific type of tissue present in an organ and its shape and functions.

70111210 Physiology (Pre-requisite: Anatomy and Histology 70111105) (3 Credit Hours) (Blended)

This course is dealing with principles of human physiology and designed to teach the student how the human body works, also to describe the detailed function of every single system. At the end of the course the student is expected to gain knowledge about Homeostasis and body fluids, Transport across the cell membrane, Nervous system and Autonomic nervous system, Muscle physiology, Blood, Heart and circulation, Cardiac output and Respiratory system.

70111211 Physiology Practical (Pre-requisite: Physiology 70111210) (1 Credit Hour) (Face to face)

The course illustrate the basic principles of physiology and to develop the student's ability to carry out measurements and make observation. It includes experiments on blood, cardiovascular system, eye and vision, endocrine system, pulse and blood pressure, muscle physiology and reflexes, respiratory physiology, nutrition.

70112112 Pathophysiology (Pre-requisite: Physiology 70111210) (3 Credit Hours) (Blended)

This course presents a study on the nature of diseases in terms of their causes and the accompanying changes in the functions of the human body, with an explanation of the mechanism of disease occurrence, its symptoms and complications. The course covers several topics starting with an introductory explanation about the course and the most important disease definitions, then it deals with each organ of the body, including diseases of the blood, heart and circulatory system, respiratory system, muscles and nervous system, digestive system, kidneys and body fluid regulation, endocrine glands, digestive system, system respiratory system.

70113229 Immunology (Prerequisite: Pharmaceutical Microbiology 70113121) (3 Credit Hours) (Blended)

This course presents the basics of immunology, which includes the components of the immune system, its cells, organs and normal functions, how congenital and cellular immune responses occur for the first and subsequent time, types of memory cells and how to stimulate them more quickly in protecting the body from foreign bodies and microbes, which include bacteria, viruses and fungi. This course also discusses the occurrence of immune responses in organ

transplantation, diseases related to the autoimmune system, allergies, immunodeficiencies, organ rejection, and immunodeficiency, in addition to immunizations.

70134139 Pharmaceutical Legislation and Ethics (Pre-requisite: Pharmacology (3) 70123232) (3 Credit Hours) (Blended)

In this course, the student learns the basic legislation and the applicable law for practicing the profession of pharmacy in various pharmaceutical fields. The student also is acquainted with the Pharmacists Syndicate in terms of its structure and tasks, and the ethics that control the relationship with patients, colleagues, and other health personnel for the purposes of optimal delivery of pharmaceutical services

70111265 Pharmaceutical Organic Chemistry (Prerequisite: Organic Chemistry 70111106) (3 Credit Hours) (Face to Face)

The major aim of this course is to explore organic chemistry and to employ a prior knowledge in more advanced topics such as Chemistry of Benzene; Alcohols and Phenols; Ethers and Epoxides; Thiols and Sulfides; Aldehydes and Ketones; Carboxylic Acids and Nitriles; Carboxylic Acid Derivatives; Carboxylic Acids and Nitriles; Carbonyl Alpha-Substitution Reaction; Amines and Heterocycles.

70112111 Biochemistry (Pre-requisite: General Chemistry 505551103) (3 Credit Hours) (Blended)

The course aims to provide the student with the basics of biochemistry. The course covers the following topics: acids and bases, buffer solutions, amino acids, peptides and proteins, enzymes, carbohydrates, lipids and related compounds, nucleotides and nucleic acids, vitamins and coenzymes, and hormones.

70112110 Pharmacognesy and Phytochemistry (Pre-requisite: Pharmaceutical Organic Chemistry 70111265) (3 Credit Hours) (Blended)

This course provides basic information about the categories of natural products, their naming, and classification, extraction and distribution methods. It also focuses on the study of secondary metabolites produced by plants and microorganisms, which are an important source of natural medicines. In addition to methods of discovery and its importance in pharmaceutical care.

70112113 Physical Pharmacy (Pre-requisite: General Chemistry505551103) (2 Credit Hours) (Face to Face)

This course is designed to introduce students to the basics of physical pharmacy such as states of matter, solubility, dissolution, colligative properties of ionic and non-ionic solutions, diffusivity, pH-regulating solutions, and chemical kinetics of drugs. From this knowledge, pharmaceutical forms are studied in terms of their physical and chemical characteristics and drug synthesis processes. Detailed examples and applications related to the topics studied are given at the end of each unit of study.

70112114 Physical Pharmacy Practical (Co-requisite: Physical Pharmacy 70112113) (1 Credit Hour) (Face to Face)

This course represents an application of theoretical physical pharmacy, as it provides the student with the basics of using a computer to analyze the results of pharmaceutical experiments, draw the relationship between states of matter and physical variables, and find the value of the relevant variables. Methods of preparing pH-regulating solutions and preparing osmotic pressure-neutral solutions are also dealt with. The thermal changes of the solutions, diffusion, the rate and order of the chemical reaction, the effect of heat on the rate of the chemical reaction and the distribution phenomenon are also studied.

70122216 Clinical Biochemistry (Pre-requisite: Biochemistry 70112111) (3 Credit Hours) (Blended)

This course will introduce the different biological samples that can be obtained from patients (such as, blood, urine and feces). It also describes the changes to the body's chemistry when affected by diseases. The course includes specimen collection and processing, water and electrolytes balance, hydrogen ion homeostasis and blood gases, the kidney, plasma proteins, clinical enzymology.

70113125 Medicinal Chemistry-2 (Pre-requisite: Medicinal Chemistry (1) 70112215) (2 Credit Hours) (Face to face)

This course includes a study of a group of physicochemical characteristics of antibiotics in particular, including those containing the lactam ring, sulfonamides, tetracyclines, aminoglycosides, quinolones, chloramphenicol, antivirals, antifungals, and anti-tuberculosis. In

addition, this course will introduce students to the history of the discovery of antibiotics, their natural sources, the challenges that appear, especially biological resistance, and how to solve these problems by modifying the chemical structure, and introducing them to the most important versions of them. This course focuses on introducing the student to the mechanism of drug action and its connection to its receptor, and how to increase the selectivity of drugs to increase efficacy and reduce side effects and biological resistance.

70113126 Medicinal Chemistry Practical (Co-requisite: Medicinal Chemistry 70113125) (1 Credit Hour) (Face To Face)

This course deals with the study of drug molecules from several aspects, such as some identification tests for certain chemical groups, how to perform drug tests following well-documented procedures from the British or US Pharmacopoeia, and compare the results with the acceptable ranges for such tests from the Pharmacopoeia. The second part of the course will deal with how to manufacture and purification of some drug molecules such as aspirin, paracetamol, sulfasalazine, and benzocaine using known chemical reactions and purification techniques such as crystallization, filtration, extraction, etc.

70155262 Drug Design (Pre-requisite: Medicinal Chemistry (3) 70113230) (3 Credit Hours) (Blended)

This course is an application of what has been learned from the chemical properties of various drugs and their receptors and their relationship to efficacy and toxicity in medicinal chemistry (1, 3, 2). It is concerned with introducing the student to the basic steps in the drug discovery stage, including the use of computers, chemistry modeling, and control of the structural composition of both the receptor and the drug, using the virtual survey of new drugs. Emphasis will be placed on studying the properties of the lead drug and ways to develop it to design new compounds and improve efficacy. Drug interactions with enzymes and receptors are also studied at the molecular level, with emphasis on physiochemical factors affecting drug binding. The last part of this course deals with the study of new methods of drug design, such as drugs linked with DNA and prodrugs, which are normally activated by metabolic processes in the body.

70154244 Cosmetics (Pre-requisite: Pharmaceutics 70153227) (2 Credit Hours) (Blended)

The aim of this course is to provide students with knowledge about the different pharmaceutical forms of cosmetics, their components, mechanism of action, and methods of use. Students will also be provided with international and local regulations that must be followed when manufacturing and marketing various cosmetics. The first part of the course covers the good manufacturing systems that govern the manufacture of cosmetics, especially in the United States of America, the European Union, and Jordan. The role of the quality control unit and the expectations of the US Food and Drug Administration in cosmetics GMP developments will also be discussed. The second part of the course covers different cosmetic formulations such as shampoos, skin lotions, oral products, perfumes and their main ingredients as well as their uses.

70123231 Biopharmaceutics (Pre-requisite: Physical Pharmacy 70112113) (2 Credit Hours) (Blended)

This course introduces students to biopharmaceutical concepts including absorption, distribution, metabolism, and drug excretion. The basic principles and concepts of biopharmaceuticals that affect the absorption and distribution of drugs in the body will be discussed. This course will also cover methods of administration and the influence of the physical and chemical properties of drugs and their products on the bioavailability of these drugs.

70124133 Pharmacokinetics (Pre-requisite: Pharmacology (2) 70123122) (3 Credit Hours) (Face to Face)

This course will enable the student to understand the pharmacokinetic principles, terminology, models, equations and factors affecting drug absorption, distribution, metabolism, excretion and their importance in the therapeutic or toxic effects of drugs. Emphasis will be placed on predicting drug levels in blood plasma under different conditions for which different pharmacokinetic criteria are applied. In addition, solved examples will be used to illustrate the application of pharmacokinetic principles with equations, making them realistic for clinical practice.

70124134 Pharmacokinetics Practical (Co-requisite: Pharmacokinetics 70124133) (1 Credit Hour) (Face to Face)

This course is an integral part of the theoretical course offered by the pharmacokinetics course, where students will acquire knowledge of the practical applications used in solving problems and pharmacokinetic applications. This course provides an overview of basic pharmacokinetic concepts with regard to rate and order of processes, coefficients commonly used in classical

(compartmental) pharmacokinetics, and nonlinear pharmacokinetics. In addition, this article briefly highlights some modern models such as the physiological model in the body. During clinical applications, students will use raw plasma concentration data to derive pharmacokinetic models that best describe drug absorption, distribution and elimination, and then derive specific pharmacokinetic parameters through a number of important practical techniques. Students also gain experience related to calculating and extracting these transactions.

70155150 Industrial Pharmacy (Pre-requisite: Biopharmaceutics 70134241) (3 Credit Hours) (Blended)

This course will introduce the student to the concepts surrounding the manufacturing of solid dosage forms such as tablets and capsules. Pharmaceutical industrial processes will be discussed in details like drying, mixing, filtration and powder fluidity. The student will apply the knowledge to the pharmaceutical technology methods used in formulating and pre-formulating several dosage forms. The course will also cover the different stages of tablet manufacturing and the inactive ingredients used as well as the tablet coating procedures.

70155151 Industrial Pharmacy Practical (Co-requisite: Industrial Pharmacy 70155150) (1 Credit Hour) (Face to Face)

This course is complementary part to the theoretical lectures provided by the co-requisite course Industrial pharmacy. This course is designed to give the students a detailed knowledge concerning powders used in pharmaceutical formulations including: powder-mixing, milling, characterization of flowability, compressibility and particle size analysis, in addition to wet granulation of powders as one of the main prerequisite steps for tablet compression. Dissolution testing will also be done for tablets bought from the market. In addition, the students will be asked to evaluate compressed tablets the granulating mixture they prepared as per the QC tests done in industry including: flowability by measuring Carr's Index and Hausner's ratio as well as the angle of repose, disintegration, hardness, and friability.

70135146 Pharmacoeconomics (Pre-requisite: Pharmacology (3) 70123232) (2 Credit Hours) (Blended)

This course presents the basic principles of the concept of pharmaceutical economics and its practical applications in pharmaceutical institutions and drug pricing. It also covers models and tools that enable policy and decision makers and health care providers to rationalize decisions related to the optimal use of medicines and pharmaceutical services necessary to reach the desired pharmaceutical care outcomes for patients and society.

70112217 Microbiology (Pre-requisite: Anatomy and Histology70111105) (2 Credit Hours) (Blended)

This course will cover the types of beneficial and harmless microorganisms and the history of the discovery of this science. A study of bacterial vital processes, the growth and cultivation of bacteria in various ways, the classification of bacteria, viruses, fungi, and diseases caused by germs to the human body. Moreover, this course will cover the basic principles related to immunology, vaccinations, allergic diseases, and the body's resistance to various diseases.

70122218 Pharmacology-1 (Prerequisite: Phathophysiology70112112) (3 Credit Hours) (Face to Face)

This course will cover important concepts related to the basis of drug action and the pharmacological basis of compounds used in treatment. Part one will cover general principles of pharmacology, including pharmacodynamics and pharmacokinetics. Part two will cover knowledge of pharmacological principles and their application in the therapeutic use of drugs that act on the autonomic nervous system, cardiovascular drugs, drugs that act on the blood, and drugs used in the treatment of inflammatory diseases.

70123122 Pharmacology-2 (Pre-requisite: Pharmacology-1 70122218) (3 Credit Hours) (Face to Face)

This course is a continuation of the course of Pharmacology 1. The course provides knowledge of pharmacological principles and their application in the therapeutic use of drugs that act on the endocrine glands, the skeletal system, the respiratory system, and the digestive system, with a focus on the mechanism of action, side effects, contraindications, and the most important clinical uses.

70123123 Pharmacology-2 Practical (Co-requisite: Pharmacology-2 70123122)

(1 Credit Hour) (Face to Face)

This course provides students with knowledge and skills related to laboratory experiments associated with laboratory animal handling and drug administration, route of drug administration, blood collection techniques in laboratory animals, and euthanasia techniques used in experimental pharmacology.

70113121 Pharmaceutical Microbiology (Pre-requisite: Microbiology 70112217) (3 Credit Hours) (Blended)

This course will cover the properties of antimicrobials in terms of type and uses, mechanism of action, pharmacological effects, microbial resistance to these drugs, factors that play a role in the process of resistance and its various types, how to control it, and protect the pharmaceutical product during and after manufacturing from bacterial decomposition, how to preserve proper drugs, the work of QA, QC, and the benefit of Recombinant DNA Technology in antibiotics.

70124135 Clinical Pharmacy and therapeutics (1) (Pre- requisite: Pharmacology (3) 70123232) (3 Credit Hours) (Face to Face)

This course teaches students how to apply the principles of treating various human diseases and conditions by utilizing their knowledge of pharmacology, pathophysiology, and pharmacokinetics. The course will utilize a patient-centered approach, where students are expected to understand human diseases and how to treat them using current treatment guidelines and practice, while monitoring for drug interactions, adverse effects, and therapeutic outcomes. This course will focus on cardiovascular, respiratory, and renal disorders.

70123232 Pharmacology-3 (Pre-requisite: Pharmacology (2) 70123122) (3 Credit Hours) (Blended)

This course is complementary to pharmacology courses 1 and 2. It provides students with knowledge of pathophysiology, clinical manifestations, complications, the goal of drug therapy, and educating the patient about the drugs that are used in chemotherapy for infectious, bacterial, fungal, and viral diseases. In addition to malignant diseases, this course will cover drugs used in the treatment of the most common neurological diseases. Further, the mechanism(s), side effects, drug interactions, contraindications and clinical uses will be discussed.

70125145 Over the counter drugs (Pre-requisite: Pharmacology (3) 70123232) (2 Credit Hours) (Blended)

Over the counter medications course familiarizes students with Medications available for patients purchase without a medical prescription and are referred to as Over-The-Counter (OTC) Drugs. It helps students to gain the needed knowledge for distinguishing and dispensing such medications in the pharmacy without a medical prescription, emphasizing self-care and providing optimum patient centered practice. This course teaches students to distinguish between situations necessitating a doctor's referral and those suitable for treatment in the pharmacy using OTC drugs. Furthermore, it equips the students with the needed knowledge and skills that are essential to provide appropriate patient counseling.

70124243 Toxicology (Pre-requisite: Pharmacology (3) 70123232) (2 Credit Hours) (Blended)

This course deals with various aspects of toxicology. Basic information is provided on important areas of toxicology including principles of toxicology, dose-response relationship, and mechanisms of action of a toxicant. This course also deals with the appropriate methods of detoxification in general and the toxic effects on human health of heavy metals, pesticides and household materials such as different alcohols, and different groups of medicines, in addition to knowing the antidotes of these toxins and their mechanisms of action.

70152219 Pharmaceutical Calculation and Compounding of Dosage Forms (Pre-requisite Physical Pharmacy 70112113 (2 Credit Hours) (Blended)

It deals with methods of synthesis and preparation of various pharmaceutical forms of solutions, pendants, emulsions and ointments. As well as all the information and methods of calculations necessary to produce any form of pharmaceutical.

70152220 Pharmaceutical Calculations and Compounding of Dosage Forms practical (Co-requisite: Pharmaceutical Calculations and Compounding of Dosage Forms 70152219) (1 Credit Hour) (Face to Face)

Practical application of methods to prepare a number of pharmaceutical forms. It also deals with the definition of the principles of pharmacological synthesis and the origins of packing and the use

of properties of different substances and components in the synthesis of pharmaceutical forms and their impact on the final product.

70123124 Medicinal Phytotherapy (Pre-requisite: Pharmacognosy and Phytochemistry 70112110) (3 Credit Hours) (Blended)

This course will provide the students with the basic knowledge and understanding of the scientific name, synonyms, botanical name and common name of the medicinal plants. The parts used, properties, active ingredients, therapeutic uses, dosage forms, and Clinical pharmacognosy, toxicity, cautions, and adverse reactions, interactions with other herbs and with other drugs.

70155256 Pharmaceutical Technology (Pre-requisite: Industrial Pharmacy 70155150) (3 Credit Hours) (Blended)

This course covers the fundamental concepts of updating theories and technology used to formulate and evaluate novel dosage forms. It is designed to help the student to achieve the primary goal of pharmaceutical technology in drug delivery, which is to recognize the challenges to the formulation scientist in overcoming the biological barrier properties, develop and design a quality product in a way that the manufacturing process is consistently delivering the intended performance of the product.

70135255 Pharmaceutical Marketing (Pre-requisite: Pharmacoeconomics 70135146) (2 Credit Hours) (Blended)

This course aims to provide comprehensive marketing overview in terms of concepts and techniques to students who are entering employment in any capacity within the field of pharmacy. This involves fostering the acquisition of knowledge and skills required to excel in the areas of value added services, pharmaceutical marketing including distribution, promotion, pricing and products. Emphasis is placed on the use of active learning strategies rather than passive listening and regurgitation of information. This is to ensure that the students have adequate opportunity to elaborate and learn the information and skills that are presented. One of the strategies to accomplish this will be group discussion with some role models in the field of pharmaceutical marketing in Jordan.

70115264 First Aid (No Prerequisite) (3 Credit Hours) (Blended)

Provide students with basic skills and knowledge that help them identify injuries and accidents, and intervene accordingly at the accident site. It also provides students with the necessary skills to assess emergency incidents and implement first aid procedures that will prevent further complications using available resources until the injured/patient is transferred to the hospital.

70145158 Research Project (Pre-requisite Successfully Complete 120 C.H) (3 Credit Hours) (Blended)

Conducting a research in one of the pharmaceutical sciences under the supervision of a faculty member in the College of Pharmacy. The student is required to conduct a lecture and discussion of the submitted research and provide the information required for writing in terms of methods, results, discussion, and how to write the sources used in the research.

70115263 Poisonous and Hallucinogenic Plants (Pre-requisite: Medicinal Phytotherapy 70123124) (3 Credit Hours) (Blended)

This course provides students with knowledge about toxic and hallucinogenic plants and their effect on health in general, botanical origin, distribution, general recipes, chemical constituents, symptoms of poisoning, antidote therapy, and clinical management. This is in addition to useful information on managing poisoning with poisonous plants as well as misused medicinal plants, focusing mainly on the poisonous part of the plant.

70115261 Biostatistics (No-Prerequisite) (3 Credit Hours) (Blended)

This course will cover descriptive and inferential statistics as applied in the medical fields. The course begins with an introduction to basic statistical concepts that apply to medical sciences. Specific topics include tools for describing central tendency and scattering of data, concepts of probability, testing of statistical hypotheses and their application to group comparisons, sampling methods, and various statistical measures. Students will be trained to draw statistical inferences by estimation and to test hypotheses using relevant clinical examples.

70155160 Drug Delivery Systems (Pre-requisite: Pharmacokinetics 70124133) (3 Credit Hours) (Blended)

This course will discuss the physical, chemical and biological properties that are related to the design and manufacture of different methods of drug delivery in the body including percutaneous, liposome, monoclonal antibodies, and specific directional adherents.

70135149 Gene Therapy (Pre-requisite: Pharmaceutical Biotechnology 70154242) (3 Credit Hours) (Blended)

This course provides the student with information on how to identify disease-causing genes, and their impact on disease diagnosis, prevention, and treatment. It also discusses methods of isolating disease-causing genes, various methods of gene treatment, and methods of treating human genes. In addition, this course focuses on the regulatory aspects of biological materials and its uses in the treatment of various diseases, especially various cancers and other diseases for which no treatments are currently available.

70112215 Medicinal Chemistry (1) (Pre-requisite: Pharmaceutical Organic Chemistry 70112113) (3 Credit Hours) (Face to Face)

This course is designed to introduce students to the basics of drug chemistry. This includes physiochemical properties such as acidity, alkalinity, ionization and solubility in fats, as well as studying their effect on the kinetic and dynamic properties of drugs. In addition, this course will go through the types of basic links between the drug and the receptor in the body and the mechanism of activation or inhibition of the receptor, whether it is a protein or an enzyme. Further, this course will also cover the applications of the previous basics to drugs that affect the peripheral nervous system that bind specifically to adrenaline and acetylcholine receptors, as well as histamine receptors. The student will be familiar with the principles of drug design based on the receptor so that the drug is an activator or an inhibitor of it.

70113230 Medicinal Chemistry (3) (Pre-requisite: Medicinal Chemistry (2) 70113125) (2 Credit Hours) (Face to Face)

The first part of this course covers the study of anticancer drugs such as alkylating agents, platinum-based drugs, anti-metabolites, antibiotics, cell division inhibitors, and new cancer-targeted therapies. The second part discusses the development of respiratory and cardiovascular drugs, especially drugs used in the treatment of high blood pressure, such as beta-blockers, calcium channels, angiotensin-converting enzyme (ACE) inhibitors, and angiotensin II receptor

antagonists, and drugs for the treatment of type 2 diabetes and non-steroidal analgesics, in addition to studying the design and development of gastric proton pump inhibitors. Emphasis is placed on the physiochemical characteristics of the aforementioned hosts and the effect of these properties on binding to their receptors and on their kinetics within the body, and how to change the chemical structure to increase potency and reduce toxicity.

70125147 Clinical Pharmacy and Therapeutics (2) (Pre-requisite: Clinical Pharmacy and Therapeutics (1) 70124135) (3 Credit Hours) (face to face)

Providing students with knowledge of the clinical manifestations, complications, and goals of drug therapy, and educating patients with selected diseases of the respiratory, renal, infectious, intestinal, and muscular diseases. In addition, it aims to provide students with knowledge of clinical uses, pharmacokinetics, clinically significant side effects, drug interactions, and contraindications for the use of drugs in the treatment of previously identified disorders.

70154242 Pharmaceutical Biotechnology (Pre-requisite: Immunotherapy 70124138) (3 Credit Hours) (Face to Face)

This course provides students with an introduction to DNA divisions and gene expression in primary and developed cells and exposure to nucleic acid technology and gene cloning to prepare protein drugs and other pharmaceutical materials for the treatment and detection of diseases. The different types of vectors, how to isolate the therapeutic proteins produced, methods of purifying them and delivering them to therapeutic doses, modern methods of giving them, an explanation of how insulin / interferons are produced, their advantages and disadvantages, in addition to methods of improving and producing vaccines.

70155159 Genetic Engineering (Pre-requisite: Immunotherapy 70124138) (3 Credit Hours) (Blended)

This course will provide students with basic molecular biological concepts and techniques used in the fields of molecular biology, biotechnology, and genetic engineering. Current experiences and progress in these areas will be discussed as well as ethical considerations. How to obtain genetic codes and how to cut them and their scientific uses in various related sciences will be explained.

70124138 Immunotherapy (Pre-requisite Immunology 70113229) (3 Credit Hours) (Blended)

This course deals with modern immunological methods for treating immunological diseases such as hypersensitivity, autoimmune diseases, rejection of transplanted transplanted organs, immunodeficiency diseases, and various cancers, in addition to immunological prophylaxis by using modern vaccinations to prevent many diseases, especially some cancers. This course deals with the different types of vaccines and their generations in the occurrence of immune protection against disease infection in uninfected humans.

70144266 Pharmaceutical Field Training (1) (70144165) (2 Credit Hours) (Face to Face)

In this course, students are trained within community pharmacies and students acquire the knowledge and skills related to how to use and integrate technology in the practice of the profession of pharmacy, how to properly use different dosage forms of pharmaceuticals, perform patient education, learn how to read and deal with medical prescriptions, and learn how to interact and communication with other healthcare providers. In addition, students are expected to get acquainted with the brand names of the most common medicines in Jordan and to obtain knowledge about the principles of pharmacy management. In addition, students are expected to know how to calculate the cost of medicines covered by insurance companies.

70145267 Pharmaceutical Field Training (2) (Prerequisite 70144266) (2 Credit Hours) (Face to Face)

In this course, the student is trained in the hospital and aims to provide the student with knowledge and skill in how to use and integrate technology in the practice of the profession of pharmacy, learn how to properly use different dosage forms of pharmaceuticals, perform patient education, learn how to read and deal with medical prescriptions, and learn how to Interact and communicate with other health care providers, including patients, doctors, and others. It aims to apply knowledge of pharmacotherapy in the hospital, verify prescriptions and drug-related problems such as pharmacovigilance and report and analyze adverse drug reactions. The training provides students with the skill of communicating with others, proper monitoring of drug therapy and counseling patients. While interacting with healthcare professionals to improve drug therapy outcomes, students will develop a well-developed professional relationship with all clinical teams. Hospital training is also directed at unit dose dispensing, which is an up-to-date hospital services in addition to parenteral mixtures and total parenteral nutrition.

70144165 Virtual Pharmacy (Successfully Complete 90 CH) (2 Credit Hours) (Face to Face)

This course enables the student to obtain the necessary knowledge in patient consultation in the reality of the virtual pharmacy as a simulation of the reality of Jordanian pharmacies. This live application enables in practice directing the patient's attention towards health care, which includes drug counseling and administration in actual pharmacies.

70134136 Clinical Cases (1) (Co-requisite: Clinical Pharmacy and Therapeutics (1) 70124135) (1 Credit Hour) (Face to Face)

The course covers the foundations and skills needed to achieve optimal pharmaceutical practice in public pharmacies. The course covers methods of dealing with prescriptions, misuse of medication, and follow-up of drug interactions. The course also aims to enable the student to know the communication skills needed during the pharmaceutical practice.

70135148 Clinical Cases (2) (Co-requisite: Clinical Pharmacy and Therapeutics (2) 70125147) (1 Credit Hour) (Face to Face)

The course covers the foundations and skills needed to achieve optimal pharmacy practice in hospitals. The course covers how to apply pharmacological information, clinical skills and practices of the pharmacist, and proper methods of communication with patients and providing the pharmaceutical service in relation to the practice of the profession. The course also aims to enable the student to know the communication skills needed during the pharmaceutical practice and to provide pharmaceutical advice to the patient based on the principle of evidence-based science.

70134241 Pharmacy Practice (1) lab (Pre-requisite: Pharmaceutics 70153227) (1 Credit Hour) (Face to Face)

The course enables the student to adopt a way of thinking to deal with some common diseases. The course aims to teach students the basic skills required to achieve the possibility of self-learning. The course covers the basic concepts in dealing with some different health disorders, presenting these pathological conditions in reality, so that the student can solve the problem through clinical reasoning for it, so that the process of finding the necessary information to solve the problem is the responsibility of the students in conjunction with their work as small work groups.

70135254 Pharmacy Practice (2) Lab (Pre-requisite: Industrial pharmacy 70155150) (1 Credit Hour) (Face to Face)

This course has a specific but more in-depth focus on some treatment areas. The teaching methodology utilizes a problem-based learning technique in which a student is expected to address and solve real-life cases through clinical analysis. The process of availing all the necessary information to solve the problem is the responsibility of the students in conjunction with their work as small work groups.

70111208 Pharmaceutical Analytical Chemistry and Instrumental Analysis (Pre-requisite: General Chemistry 50551103) (3 Credit Hours) (Face to Face)

This course will focus on various aspects of analytical chemistry covering both qualitative and quantitative chemical analysis. Stoichiometric calculations, acid-base balance in solutions, buffer solutions, acid-base titration. In addition, it will focus on the basic principles, devices, and applications for methods of automated chemical analysis used in the examination of raw materials and pharmaceuticals. These include UV-vis spectroscopy, thin layer, gas and liquid chromatography.

70111209 Pharmaceutical Analytical Chemistry and Instrumental Analysis Practical (Co-requisite: Pharmaceutical Analytical Chemistry and Instrumental Analysis 70111208) (1 Credit Hour) (Face to Face)

This course aims to teach students the basic principles of analytical chemistry. The first part of the course will cover the preparation of reagents and Analysis of the unknown using different qualitative and quantitative analytical methods. While the second part will cover the practical applications of automated chemical analysis methods used in the analysis of raw materials and pharmaceutical preparations. They include visible and ultraviolet spectroscopy, thin-layer, gas and liquid chromatography.

70153227 Pharmaceutics (Pre-requisite: Pharmaceutical Calculation and Compounding of Dosage Forms 70152219) (2 Credit Hours) (Blended)

In this course, the student will be familiar with the basics of the solution dosing model, students will apply this knowledge to pharmaceutical dosage forms and will be introduced to rough solutions (suspension and emulsion), in addition, this course will provide the student with basic knowledge and understanding of different types of interfaces, the term surface tension and tension Interfacial and adsorption mechanism at interfaces, classification of surface active agents and quantification of their application in pharmacology along with basic knowledge of rheology. The course also aims

to introduce the student to the various pharmaceutical forms, the methods of their composition and the purpose of their use, the conversion of a chemical substance into a drug, and the study of the physico-chemical properties of the pharmaceutical forms.

70153228 Pharmaceutics Practical (Co-requisite: Pharmaceutics 70153227) (1 Credit Hour) (Face to Face)

This course aims to train the student on the steps of preparing and the principles of selecting the components included in formulations, packaging, labels, and preserving pharmaceutical formulations in their final form in order to ensure a stable and effective compound. Students will also study the effect of viscosity and surface tension on liquid pharmaceutical forms.

70125253 Clinical Pharmacy and Therapeutics (3) (Pre-requisite Clinical Pharmacy and Therapeutics (2) 70125147) (3 Credit Hours) (Face to Face)

This course aims to provide students with the knowledge of clinical manifestations, complications, goals of pharmacotherapy and patient education of selected diseases. In addition, it aims to provide the students with the knowledge of clinical uses, pharmacokinetics, clinically significant side effects and drug interactions and contraindications to medications used in the treatment of the selected disorders.

70125157 Pharmacoepidemiology (Pre-requisite: Clinical Pharmacy and Therapeutics (1) 70124135) (3 Credit Hours) (Blended)

Pharmacoepidemiology is the study of the utilization and effects of drugs in large populations. This interdisciplinary field combines principles of pharmacology and epidemiology to understand the patterns, determinants, and effects of medication use on public health. This course provides an overview of key concepts, methods, and applications in pharmacoepidemiology.

70115265 Special Topics (No-prerequisite) (3 Credit Hours) (Blended)

This course offers an in-depth exploration of emerging issues, current trends, and specialized areas in pharmacy practice and pharmaceutical sciences. Through a combination of lectures, seminars, and practical exercises, students will delve into selected topics that may include but are not limited to advanced pharmacotherapy, pharmaceutical compounding, medication therapy management, pharmaceutical industry practices, and regulatory affairs.