



Doctor of Pharmacy

Program Guide



Faculty of Pharmacy
University of Jordan
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A. Constituents of Program:

The PharmD. program consists of (216) Credit hours of the following requirements:

No.	Type of Requirements	Credit Hours	Description
I	University Requirements	27	Obligatory Courses: (21) Cr Hrs Elective Courses: (6) Cr Hrs
II	Faculty Requirement	34	All obligatory (34) Cr Hrs
III	Specialty Requirement	155	Obligatory Courses: (143) Cr Hrs Elective Courses: (12) Cr Hrs
TOTAL HOURS		216	

B. Numberings System:

1. Departments Codes:

Code	Department
01	Pharmaceutical Sciences
02	Pharmaceutics and Pharmaceutical Technology
03	Biopharmaceutics and Clinical Pharmacy

2. Courses Numbers:

Each course number consists of 7 digits:

Faculty	Department	Level	Area No.	Serial No.
1	2 0 1	4	1	2


I. University Requirements: (27) Credit hours
A. Obligatory Courses: (21) credit hours

Course No.	Course Name	Credit Hours	Prerequisite
1501101	Communication Skills\ Arabic (1)	3	-
1501102	Communication Skills\Arabic (2)	3	1501101
1502101	Communication Skills\ English (1)	3	-
1502102	Communication Skills\ English (2)	3	1502101
1900100	Computer Skills (1)	3	-
1500100	Military Sciences	3	-
1700100	National Education	3	-

B. Elective Courses: (6) credit hours, selected from the following courses:

Course No.	Course Name	Credit Hours	Prerequisite
0342100	Science and Society	3	-
0305100	Environment Science	3	-
1000101	Democracy and Human Rights	3	-
0401100	Islamic Culture	3	-
0402100	Islamic System	3	-
1731100	Logic Critical Thinking	3	-
1702101	Islamic Civilization	3	-
1704103	Introduction to Sociology	3	-
1706102	Principles of Psychology	3	-
1705100	Geography of Jordan	3	-
1733100	The Archaeology of Jordan	3	-
0641100	Home Garden	3	-
0803100	Introduction to Library and Information Science	3	-
0905100	Principles of Public Safety	3	-
1132100	Sport and Health	3	-
1601100	Principles of Management	3	-
0603100	Principles of Human Nutrition	3	-
0630100	Agriculture In Jordan	3	-



II. Faculty Requirements: (34) Credit hours

Faculty requirements are all obligatory and consist of the following courses

Course No.	Course Title	Credit Hours	Weekly Hours		Prerequisites
			Lect	Pract	
0304101	General Biology (1)	3	3	-	-
0304111	General Biology Laboratory (1)	1	-	3	0304101 or Co-Req.
0303101	General Chemistry (1)	3	3	-	-
0301101	Calculus (1)	3	3	-	-
0304102	General Biology (2)	3	3	-	0304101
0303231	Organic Chemistry (1)	3	3	-	0303101
1902102	Computer (2)	3	3	-	1900100
0551214	Physiology for Pharmacy (1)	2	2	-	0304102
0532201	Anatomy and Histology for Pharmacy	2	2	-	0304102
0532202	Anatomy and Histology for Pharmacy-Practical	1	-	3	0532201 or Co-Req
0551215	Physiology for Pharmacy (2)	2	2	-	0551214
0534315	Pathology for Pharmacy	2	2	-	0532201
1203301	Pathophysiology for Pharmacy	3	3	-	0551215
1203302	First Aid	2	2	-	0532201
0702501	Basic Nursing Skills	1	1	-	1203471


III. Specialty courses (155 Credit hours)
A. Obligatory Courses: (143) Credit hours

Course No.	Course Title	Credit hours	Weekly hours		Prerequisite
			Lect.	Pract.	
1203102	Medical terminology	1	1	-	
1202134	Physicochemical principles of pharmacy	2	2	-	0303101
1203251	Biochemistry (1)	2	2	-	0303231
1201215	Pharmaceutical organic chemistry (1)	3	3	-	0303231
1201212	Pharmaceutical organic chemistry-practical	1	-	3	1201215 Or Co-Req.
1202230	Pharmaceutical calculations and compounding	2	2	-	1202134
1202234	Pharmaceutical calculations and compounding-practical	1	-	3	1202230 Or Co-Req.
1203252	Biochemistry-practical	1	-	3	1203251 Or Co-Req.
1203253	Biochemistry (2)	3	3	-	1203251
1202235	Physical pharmacy	2	2	-	1202134
1201201	Pharmaceutical chemical analysis	2	2	-	0303231
1201202	Pharmaceutical chemical analysis – Practical	1	-	3	1201201 Or Co-Req.
1203363	Pharmacology (1)	3	3	-	0551215
1203365	Pharmacology-practical	1	-	3	1203363 Or Co-Req.
1201321	Pharmacognosy	2	2	-	0304102+ 1203251
1201322	Pharmacognosy- practical	1	-	3	1201321 Or Co-Req.
1202381	Pharmaceutical Statistics	2	2	-	0301101
1202331	Pharmaceutical technology (1)	2	2	-	1202230
1202434	Pharmaceutical technology-practical (1)	1	-	3	1202331 Or Co-Req.
1203364	Pharmacology (2)	3	3	-	1203363
1203302	Immunology and Genetics	3	3	-	1203253
1201315	Pharmaceutical instrumental analysis	2	2	-	1201201
1201316	Pharmaceutical instrumental analysis-practical	1	-	3	1201315 Or Co-Req.



Course No.	Course Title	Credit hours	Weekly hours		Prerequisite
			Lect.	Pract.	
1201390	Chemistry of medicinal plants	2	2	-	1201321
1202341	Pharmaceutical microbiology (1)	3	3	-	0304102
1200401	Pharmaceutical field training (1)	2	-	10	1203364
1203401	Therapeutics (1)	3	3	-	1203364
1203402	Case studies in therapeutics (1)	1	-	3	1203426 Or Co-Req.
1201401	Medicinal Chemistry (1)	3	3	-	1201215+ 1203364
1203471	Biopharmaceutics	2	2	-	1202235
1202441	Pharmaceutical Microbiology (2)	2	2	-	1202341
1202442	Pharmaceutical Microbiology - practical	1	-	3	1202441 Or Co-Req.
1203411	Clinical biochemistry (1)	2	2	-	1203301+ 1203253
1203405	Pharmacy practice (1)	2	2	-	1203364
1203429	Therapeutics (2)	3	3	-	1203364
1203430	Case studies in therapeutics (2)	1	-	3	1203429 Or Co-Req.
1201402	Medicinal chemistry (2)	2	2	-	1201401
1203475	Pharmacokinetics	2	2	-	1203471
1203476	Case studies in pharmacokinetics	1	-	3	1203475 Or Co-Req.
1203412	Clinical Biochemistry (2)	2	2	-	1203411
1203406	Pharmacy practice (2)	2	2	-	1203405
1201414	Complementary and alternative medicine	3	3	-	1201390
1203401	Pharmacoeconomics	2	2	-	1203364
1200402	Pharmaceutical field training (2)	2	-	10	1203364
1203504	Therapeutics (3)	3	3	-	1203364
1203505	Case studies in therapeutics (3)	1	-	3	1203504 Or Co-Req.
1203513	Pharmaceutical promotion and marketing (1)	3	3	-	1203401
1203477	Clinical pharmacokinetics	2	2	-	1203475
1201515	Medicinal Chemistry (3)	3	3	-	1201401
1203516	Pharmacy practice (3)	1	1	-	1203405
1203562	Toxicology	2	2	-	1203364



Course No.	Course Title	Credit hours	Weekly hours		Prerequisite
			Lect.	Pract.	
1203506	Therapeutics (4)	3	3	-	1203401
1203507	Case studies in therapeutics (4)	1	-	3	1203506 Or Co-Req.
1203517	Pharmacy regulations and ethics	2	2	-	1203364
1203518	Pharmaceutical Literature evaluation	2	2	-	1203405
1203519	Pharmaceutical Nutrition and diet therapy	3	3	-	1203412
1203563	Nonprescription drugs	2	2	-	1203363
1203611	Internal medicine clerkship (1)	7	-	21	1203506
1203620	Pediatric clerkship	4	-	12	1203506
1203634	Geriatric and psychiatric clerkship	2	-	6	1203506
1203605	Obstetrics and gynecology clerkship	2	-	6	1203506
1203603	Internal medicine clerkship (2)	7	-	21	1203506
1203607	Clinical pharmacokinetics clerkship	2	-	6	1203506
1203606	Surgery Clerkship	2	-	6	1203506
1203608	Ambulatory care clerkship	3	-	9	1203506
1203610	Research project	1	1	-	1203506


B. Elective Courses: 12 Credit hours to selected from the following courses:

Course No.	Course Title	Credit Hours	WeeklyHours		Prerequisites
			Lect	Pract	
1201531	Poisonous and hallucinogenic plants	2	2	-	1203364
1201524	Applied chromatography	2	2	-	1201315
1202533	Pharmaceutical radioisotopes	2	2	-	1201401
1201535	Pharmaceutical biotechnology	2	2	-	1201401
1202536	Cosmetics science	2	2	-	1202230
1202532	Selected Topics in Physical Pharmacy	2	2	-	1202235
1203514	Pharmaceutical marketing and promotion (2)	2	2	-	1203513
1213552	Parapharmaceuticals	2	2	-	1203364
1213563	Selected topics in clinical toxicology	2	2	-	1203562
1202541	Selected topics in pharmaceutical microbiology	2	2	-	1202441
1203515	Pharmaceutical intellectual property	2	2	-	12032401
1201571	Seminar in pharmaceutical sciences	1	1	-	1201401+ 1201390
1202572	Seminar in pharmaceutics and pharmaceutical technology	1	1	-	1202331+ 1202341
1203573	Seminar in biopharmaceutics and clinical pharmacy	1	1	-	1203429


Offered Courses

Course No.	Course Title	Credit hours	Weekly hours		Prerequisite
			Lect	Pract.	
1203102	Medical terminology	1	1	-	
1202134	Physicochemical principles of pharmacy	2	2	-	0303101
1203251	Biochemistry (1)	2	2	-	0303231
1201215	Pharmaceutical organic chemistry	3	3	-	0303231
1201212	Pharmaceutical organic chemistry-practical	1	-	3	1201215 Or Co-Req.
1202230	Pharmaceutical calculations and compounding	2	2	-	1202134
1202234	Pharmaceutical calculations and compounding-practical	1	-	3	1202230 Or Co-Req.
1203252	Biochemistry-practical	1	-	3	1203251 Or Co-Req.
1203253	Biochemistry (2)	3	3	-	1203251
1202235	Physical pharmacy	2	2	-	1202134
1201201	Pharmaceutical chemical analysis	2	2	-	0303231
1201202	Pharmaceutical chemical analysis – Practical	1	-	3	1201201 Or Co-Req.
1203363	Pharmacology (1)	3	3	-	0551215
1203365	Pharmacology-practical	1	-	3	1203363 Or Co-Req.
1201321	Pharmacognosy	2	2	-	0304102+ 1203251
1201322	Pharmacognosy- practical	1	-	3	1201321 Or Co-Req.
1202381	Pharmaceutical Statistics	2	2	-	0301101
1203302	First Aid	2	2	-	0532201
1202331	Pharmaceutical technology (1)	2	2	-	1202230
1202434	Pharmaceutical technology-practical (1)	1	-	3	1202331 Or Co-Req.
1203364	Pharmacology (2)	3	3	-	1203363
1203301	Pathophysiology for pharmacy	3	3	-	0551215
1203302	Immunology and Genetics	3	3	-	1203253
1201315	Pharmaceutical instrumental analysis	2	2	-	1201201



Course No.	Course Title	Credit hours	Weekly hours		Prerequisite
			Lect	Pract.	
1201316	Pharmaceutical instrumental analysis-practical	1	-	3	1201315 Or Co-Req.
1201390	Chemistry of medicinal plants	2	2	-	1201321
1202341	Pharmaceutical microbiology (1)	3	3	-	0304102
1200401	Pharmaceutical field training (1)	2	-	10	1203364
1203401	Therapeutics (1)	3	3	-	1203364
1203402	Case studies in therapeutics (1)	1	-	3	1203426 Or Co-Req.
1201401	Medicinal Chemistry (1)	3	3	-	1201215 1203364
1203471	Biopharmaceutics	2	2	-	1202235
1202441	Pharmaceutical Microbiology (2)	2	2	-	1202341
1202442	Pharmaceutical Microbiology - practical	1	-	3	1202441 Or Co-Req.
1203411	Clinical biochemistry (1)	2	2	-	1203301+ 1203253
1203405	Pharmacy practice (1)	2	2	-	1203364
1203429	Therapeutics (2)	3	3	-	1203364
1203430	Case studies in therapeutics (2)	1	-	3	1203429 Or Co-Req.
1201402	Medicinal chemistry (2)	2	2	-	1201401
1203475	Pharmacokinetics	2	2	-	1203471
1203476	Case studies in pharmacokinetics	1	-	3	1203475 Or Co-Req.
1203412	Clinical Biochemistry (2)	2	2	-	1203411
1203406	Pharmacy practice (2)	2	2	-	1203405
1201414	Complementary and alternative medicine	3	3	-	1201390
1203401	Pharmacoeconomics	2	2	-	1203364
1200402	Pharmaceutical field training (2)	2	-	10	1203364
1203504	Therapeutics (3)	3	3	-	1203364
1203505	Case studies in therapeutics (3)	1	-	3	1203504 Or Co-Req.
1203513	Pharmaceutical promotion and marketing (1)	3	3	-	1203401
1203477	Clinical pharmacokinetics	2	2	-	1203475



Course No.	Course Title	Credit hours	Weekly hours		Prerequisite
			Lect	Pract.	
1201515	Medicinal Chemistry (3)	3	3	-	1201401
1203516	Pharmacy practice (3)	1	1	-	1203405
1203562	Toxicology	2	2	-	1203364
1203506	Therapeutics (4)	3	3	-	1203401
1203507	Case studies in therapeutics (4)	1	-	3	1203506 Or Co-Req.
1203517	Pharmacy regulations and ethics	2	2	-	1203364
1203518	Pharmaceutical Literature evaluation	2	2	-	1203405
1203519	Pharmaceutical Nutrition and diet therapy	3	3	-	1203412
1203563	Nonprescription drugs	2	2	-	1203363
1203611	Internal medicine clerkship (1)	7	-	21	1203506
1203620	Pediatric clerkship	4	-	12	1203506
1203634	Geriatric and Psychiatric clerkship	2	-	6	1203506
1203605	Obstetrics and Gynecology clerkship	2	-	6	1203506
1203603	Internal medicine clerkship (2)	7	-	21	1203506
1203607	Clinical pharmacokinetics clerkship	2	-	6	1203506
1203606	Surgery clerkship	2	-	6	1203506
1203608	Ambulatory care clerkship	3	-	9	1203506
1203610	Research project	1	1	-	1203506
1201531	Poisonous and hallucinogenic plants	2	2	-	1203364
1201522	Applied chromatography	2	2	-	1201315
1202533	Pharmaceutical radioisotopes	2	2	-	1201401
1201535	Pharmaceutical biotechnology	2	2	-	1201401
1202536	Cosmetics science	2	2	-	1202230
1202532	Selected Topics in Physical Pharmacy	2	2	-	1202235
1203514	Pharmaceutical promotion and marketing (2)	2	2	-	1203513
1213552	Parapharmaceuticals	2	2	-	1203364
1213563	Selected topics in clinical toxicology	2	2	-	1203562
1202541	Selected topics in pharmaceutical microbiology	2	2	-	1202441
1203515	Pharmaceutical intellectual property	2	2	-	12032401



Course No.	Course Title	Credit hours	Weekly hours		Prerequisite
			Lect	Pract.	
1201571	Seminar in pharmaceutical sciences	1	1	-	1201401+ 1201390
1202572	Seminar in pharmaceutics and pharmaceutical technology	1	1	-	1202331+ 1202341
1203573	Seminar in Biopharmaceutics and clinical pharmacy	1	1	-	1203429


Curriculum Directory for Pharm.D. Students
**FIRST YEAR
FIRST SEMESTER**

Course No.	Course Title	Cr Hrs	Prerequisite
0304101	General Biology (1)	3	-
0304111	General Biology Laboratory (1)	1	0304101 Or Co-Req.
0303101	General Chemistry (1)	3	-
0301101	Calculus (1)	3	-
	University requirement	3	-
	University requirement	3	-
	University requirement	3	-
	TOTAL HOURS	19	

SECOND SEMESTER

Course No.	Course Title	Cr Hrs	Prerequisite
0304102	General Biology (2)	3	0304101
0303231	Organic chemistry (1)	3	0303101
1203102	Medical terminology	1	-
1202134	Physicochemical principles of pharmacy	2	0303101
1900102	Computer (2)	3	1900100
	University requirement	3	-
	University requirement	3	-
	TOTAL HOURS	18	


**SECOND YEAR
FIRST SEMESTER**

Course No.	Course Title	Cr Hrs	Prerequisite
0551214	Physiology for pharmacy (1)	2	0304102
0532201	Anatomy and histology for pharmacy	2	0304102
0532202	Anatomy and histology for pharmacy-practical	1	0532201 Or Co-Req.
1203251	Biochemistry (1)	2	0303231
1201215	Pharmaceutical organic chemistry (1)	3	0303231
1201212	Pharmaceutical organic chemistry-practical	1	1201215 Or Co-Req.
1202230	Pharmaceutical calculations and compounding	2	1202134
1202234	Pharmaceutical calculations and compounding –practical	1	1202230 Or Co-Req.
	University requirement	3	-
	TOTAL HOURS	17	

SECOND SEMESTER

Course No.	Course Title	Cr Hrs	Prerequisite
0551215	Physiology for pharmacy (2)	2	0551214
1203252	Biochemistry-practical	1	1203251 Or Co-Req
1203253	Biochemistry (2)	3	1203251
1202235	Physical pharmacy	2	1202134
1201201	Pharmaceutical chemical analysis	2	0303231
1201202	Pharmaceutical chemical analysis – Practical	1	1201201 Or Co-Req
	University requirement	3	-
	University requirement	3	-
	TOTAL HOURS	17	


**THIRD YEAR
FIRST SEMESTER**

Course No.	Course Title	Cr Hrs	Prerequisite
1203363	Pharmacology (1)	3	0551215
1203365	Pharmacology-practical	1	1203363 Or Co-Req
0534315	Pathology	2	0532201
1201321	Pharmacognosy	2	0304102+1203251
1201322	Pharmacognosy-practical	1	1201321 Or Co-Req
1202381	Pharmaceutical statistics	2	0301101
1203302	First aid	2	0532201
1202331	Pharmaceutical technology (1)	2	1202230
1202332	Pharmaceutical technology-practical	1	1202331 Or Co-Req
	University requirement	3	-
TOTAL HOURS		19	

SECOND SEMESTER

Course No.	Course Title	Cr Hrs	Prerequisite
1203364	Pharmacology (2)	3	1203363
1203301	Pathophysiology for pharmacy	3	0551215
1203302	Immunology and genetics	3	1203253
1201315	Pharmaceutical instrumental analysis	2	1201201
1201316	Pharmaceutical instrumental analysis – Pract	1	1201315 Or Co-Req
1201390	Chemistry of medicinal plants	2	1201321
1202341	Pharmaceutical microbiology (1)	3	0304102
TOTAL HOURS		17	

SUMMER SEMESTER

Course No.	Course Title	Cr Hrs	Prerequisite
1200401	Pharmaceutical Field Training (1)	2	1203364
TOTAL HOURS		2	


**FOURTH YEAR
FIRST SEMESTER**

Course No.	Course Title	Cr Hrs	Prerequisite
1203426	Therapeutics (1)	3	1203364
1203427	Case studies in therapeutics (1)	1	1203426 Or Co-Req
1201401	Medicinal chemistry (1)	3	1201215+ 1203364
1203471	Biopharmaceutics	2	1202235
1202441	Pharmaceutical microbiology (2)	2	1202341
1202442	Pharmaceutical microbiology- practical	1	1202441 Or Co-Req
1203411	Clinical biochemistry (1)	2	1203301
1203405	Pharmacy practice (1)	2	1203364
	Elective	2	-
TOTAL HOURS		18	

SECOND SEMESTER

Course No.	Course Title	Cr Hrs	Prerequisite
1203429	Therapeutics (2)	3	1203364
1203430	Case Studies in therapeutics (2)	1	1203429 Or Co-Req.
1201402	Medicinal chemistry (2)	2	1201401
1203475	Pharmacokinetics	2	1203471
1203476	Case studies in pharmacokinetics	1	1203475 Or Co-Req.
1203412	Clinical Biochemistry (2)	2	1203411
1203406	Pharmacy practice (2)	2	1203405
1201414	Complementary and alternative medicine	3	1201390
1203401	Pharmacoeconomics	2	1203364
0702501	Basic nursing	1	1203471
TOTAL HOURS		19	

SUMMER SEMESTER

Course No.	Course Title	Cr Hrs	Prerequisite
1200402	Pharmaceutical Field Training (2)	2	1203364
TOTAL HOURS		2	


**FIFTH YEAR
FIRST SEMESTER**

Course No.	Course Title	Cr Hrs	Prerequisite
1203504	Therapeutics (3)	3	1203364
1203505	Case studies in therapeutics (3)	1	1203504 Or Co-Req.
1203513	Pharmaceutical promotion and marketing (1)	3	1203401
1203577	Clinical pharmacokinetics	2	1203475
1201515	Medicinal chemistry (3)	3	1201401
1203516	Pharmacy practice (3)	1	1203405
1203562	Toxicology	2	1203364
	Elective	2	-
	Elective	2	-
TOTAL HOURS		19	

SECOND SEMESTER

Course No.	Course Title	Cr Hrs	Prerequisite
1203506	Therapeutics (4)	3	1203364
1203507	Case studies in therapeutics (4)	1	1203506 Or Co-Req.
1202517	Pharmacy regulations and ethics	2	1203364
1203518	Literature evaluation	2	1203405
1203519	Pharmaceutical nutrition and diet therapy	3	1203412
1203563	Nonprescription drugs	2	1203363
	Elective	2	-
	Elective	2	-
	Elective	2	-
TOTAL HOURS		19	


**SIXTH YEAR
FIRST SEMESTER**

Course No.	Course Title	Cr Hrs	Prerequisite
1203601	Internal medicine clerkship (1)	7*	1203506
1203603	Pediatric clerkship	4*	1203506
1203604	Geriatric and psychiatric clerkship	2*	1203506
1203605	Obstetrics and gynecology clerkship	2*	1203506
TOTAL HOURS		15	

SECOND SEMESTER

Course No.	Course Title	Cr Hrs	Prerequisite
1203602	Internal medicine clerkship (2)	7*	1203506
1203607	Kinetic clerkship	2*	1203506
1203606	Surgery clerkship	2*	1203506
1203068	Ambulatory care clerkship	3*	1203506
1203610	Research project	1	1203506
TOTAL HOURS		15	

* 1 credit hour is equivalent to 1 week of training from 8 am to 5 pm.


Course Description (Doctor of Pharmacy)
Faculty Requirements

0304101	General Biology (1) Prerequisite: (None)	(3 Cr. Hrs.)
	Internal structure of the cell. Molecules of the cell. Metabolism-respiration and photosynthesis, cell- cell signaling, cell division, Mendelian inheritance, molecular biology of the gene, DNA technology, chemical signals in plants and animals, phylogeny and systematic introduction to ecosystematics and introduction to ecosystems.	
0304111	General Biology Laboratory (1) Prerequisite: (0304101 Or Co-Req.)	(1 Cr. Hrs.)
	Laboratory experiments in microscopy and cells, chemical aspects of cells, tissues, and plant physiology. Mammalian anatomy, and systems of major living groups.	
0303101	General Chemistry (1) Prerequisite: (None)	(3 Cr. Hrs.)
	Measurements and significant figures, chemical reactions, stoichiometry, the gaseous state, thermochemistry, electronic structure and periodicity, chemical bonding, molecular shapes, states of matter and intermolecular forces, physical properties of solutions, principles of equilibrium.	
0301101	Calculus (1) Prerequisite: (None)	(3 Cr. Hrs.)
	Functions: domain, operations on function, graphs of functions, trigonometric functions; limits: meaning of a limit, computational techniques, limits at infinity, infinite limits:continuity; limits and continuity of trigonometric functions; the;the derivative: techniques of differentiation, derivatives of trigonometric functions chain rule; implicit differentiation; differentials; Rolls Theorem; the mean value theorem; the extended mean value theorem; L Hopital s rule; increasing and decreasing functions; concavity maximum and minimum and minimum values of a function; graphs of functions including rational functions (asymptotes) and factions with vertical tangents(cusps);antiderivatives; the indefinite integral; the definite integral; the fundamental theorem of calculus; the area under curve; the area between two curves; transcendental functions: inverse functions, logarithmic and exponential functions; derivatives and integrals; limits(the indeterminate forms);hyperbolic functions and their inverses; inverse trigonometric functions; some techniques of integration.	
0304102	General Biology (2) Prerequisite: (0304101)	(3 Cr. Hrs.)
	Animal and plant tissues Mammalian circulation, immune system, gas exchange, controlling the internal environment, nervous system and motor mechanism. Transport in plants, plant nutrition, plant reproduction and development. Eco-distribution and adaptations of organisms, population ecology and community ecology.	
0303231	Organic Chemistry (1)	(3 Cr. Hrs.)



	Prerequisite: (0303101)	
	Alkanes and cycloalkanes, alkenes and alkynes, stereochemistry, common organic reactions, substitution, addition, elimination, alcohols, ethers, conjugated systems.	
1902102	Computer Skills (2) Prerequisite: (1900100)	(3 Cr. Hrs.)
	Introduction: forms, controls, properties, methods, events, files, Mouse events, click, mouse movement, drag and drop, Keyboard events: Press, up and down, Menus: Creation and Code writing, Dialogue boxes: Messages, input, built-in boxes, programming: Variables, statements, arithmetic logical operators, strings, built-in functions, Control statements: simple IF, multiple IF, CASE, Loops, FOR-NEXT, DO-WHILE, DO-UNTIL, Arrays, Files: Random, sequential, binary, procedures and functions, Applications using Visual Basic, Introduction to Microsoft Access. Weekly practice in the lab.	
0551214	Physiology for Pharmacy (1) Prerequisite: (0304102)	(2 Cr. Hrs.)
	Correlation of morphological, biochemical, and functional organization of the human body as related to normal state. Topics include cell, nerve and muscle, autonomic nervous system, blood and body fluids, cardiovascular system, respiratory system physiology.	
0532201	Anatomy and Histology for Pharmacy Prerequisite: (0304102)	(2 Cr. Hrs.)
	An overview of structure of the human body and tissues and their cooperative role in normal function. Topics include: embryology, blood, nervous, musculoskeletal, skin, cardiovascular, digestive, urinary, respiratory, endocrine, and reproductive system.,	
0532202	Anatomy and Histology for Pharmacy-practical Prerequisite: (0532201 or Co-Req)	(1 Cr. Hrs.)
	A laboratory course that familiarizes students with normal structure of the human body using gross and microscopic preparations of different organs and tissues.	
0551215	Physiology for Pharmacy (2) Prerequisite: (0551214)	(2 Cr. Hrs.)
	Correlation of morphological, biochemical, and functional organization of the human body as related to normal state. Topics include: GI system, endocrine system, reproductive systems, renal system, central nervous system and special topics such as skin, and sensory organs.	
0534315	Pathology for Pharmacy Prerequisite: (0532201)	(2 Cr. Hrs.)
	Introduces the basic concepts, terminology, etiology, and characteristics of inflammation, cell injury, aging, neoplasia, and skin disorders.	
1203302	First aid Prerequisite: (0532201)	(2 Cr. Hrs.)
	Concerns general principles and techniques of first aid at premedical stage in case of	



	life-threatening situations.	
1203301	Pathophysiology for Pharmacy Prerequisite: (0551215)	(2 Cr. Hrs.)
	Considers the nature of major diseases, associated alterations in structure and function of human organs, and their clinical manifestations. Topics include cardiology, rheumatology, endocrine gastrointestinal disorders and hematologic/ oncologic, respiratory, renal and infectious diseases.,	
0702501	Basic Nursing skills for pharmacy Prerequisite: (1203471)	(1 Cr. Hrs.)
	Familiarizes students with methods of parenteral and rectal drug administration, vascular access and devices, wound care, blood pressure and pulse measurement	


Specialty Requirements

1203102	Medical terminology Prerequisite: (None)	(1 Cr. Hrs.)
	Development of basic knowledge of medical terms used in medical and biological sciences. Students systematically analyze/build words from combining forms, suffixes, and prefixes.	
1202134	Physicochemical Principles of Pharmacy Prerequisite: (0303101)	(2 Cr. Hrs.)
	Study of the physicochemical properties of molecules incorporated in pharmaceutical preparations.	
1203251	Biochemistry (1) Prerequisite: (0303231)	(2 Cr. Hrs.)
	Provides principle information concerning the chemical and physical properties of biomolecules (carbohydrates, lipids and proteins) and their interrelated functioning in a biological system. Bioenergetics and oxidative phosphorylations will be covered.	
1201215	Pharmaceutical Organic Chemistry Prerequisite: (0303231)	(3 Cr. Hrs.)
	Classification, nomenclature, properties, reactions and preparation of various organic compounds (emphasis on those of pharmaceutical significance).	
1201212	Pharmaceutical Organic Chemistry –Practical Prerequisite: (1201215 or Co-Req.)	(1 Cr. Hrs.)
	Applications of various methods and techniques used in the identifications of functional groups of organic compounds of pharmaceutical interest. Synthesis of some compounds will be undertaken	
1202230	Pharmaceutical Calculations and Compounding Prerequisite: (1202134)	(2 Cr. Hrs.)
	Formulation and compounding of various pharmaceutical dosage forms (solutions, suspensions, emulsions and ointments). In addition to calculation methodologies needed to produce any pharmaceutical preparation.	
1202234	Pharmaceutical Calculations and Compounding - Practical Prerequisite: (1202230 or Co-Req.)	(1 Cr. Hrs.)
	Application of pharmaceutical preparation methods. Introduction to pharmaceutical packaging. Utilization of component properties in pharmaceutical preparations and their impact on the final product.	
1203252	Biochemistry - Practical Prerequisite: (1203251 or Co-Req.)	(1 Cr. Hrs.)
	Application of basic methods in the identification of sugars, proteins and fats. In addition to the analysis of these groups in biological fluids and analysis of enzymatic reactions.	
1203253	Biochemistry (2)	(3 Cr. Hrs.)



	Prerequisite: (0551214)	
	Main biochemical concepts regarding the different metabolic pathways of biomolecules; carbohydrates, lipids. Proteins and nucleotides. Storage and expression of genetic information will also be covered.	
1202235	Physical Pharmacy Prerequisite: (1202134)	(2 Cr. Hrs.)
	Study of physico-chemical properties that control complex formation including drug stability and factors affecting it and shelf-life determinations. In addition, diffusion and absorption will be discussed.	
1201201	Pharmaceutical Chemical Analysis Prerequisite: (0303231)	(2 Cr. Hrs.)
	discusses various analytical methods used in drug analysis in order to identify structure, purity and action.	
1201202	Pharmaceutical Chemical Analysis - Practical Prerequisite: (1201201 or Co-Req)	(1 Cr. Hrs.)
	The practical course is designed for the applications of various analytical methods to substances used in pharmacy and medicine.	
1203363	Pharmacology (1) Prerequisite: (0551215)	(3 Cr. Hrs.)
	Basic principles of pharmacology: pharmacodynamics, pharmacokinetic principles, adverse drug reactions, drug-drug interactions, development of new drugs. Major categories: drugs affecting autonomic nervous system, cardiovascular system, blood, autacoids, respiratory and gastrointestinal system.	
1203364	Pharmacology-practical Prerequisite: (1203363 or Co-Req.)	(1 Cr. Hrs.)
	A laboratory course designed to familiarize students with methods used to assess drug action and to demonstrate pharmacological properties of some drugs.	
1201321	Pharmacognosy Prerequisite: (0304102 + 1203251)	(2 Cr. Hrs.)
	Study of basic information on pharmacognosy and medicinal plants regarding classification and identification of their components with emphasis on primary metabolites (carbohydrates, lipids, amino acids and drugs derived from them).	
1201322	Pharmacognosy - Practical Prerequisite: (1201321 or Co-Req.)	(1 Cr. Hrs.)
	Physical and microscopical examinations of some medicinal plants and identification of them and of their components using chromatographic and compendial qualitative and quantitative analysis	
1202381	Pharmaceutical Statistics Prerequisite: (0301101)	(2 Cr. Hrs.)
	Application of basic statistical principles in different pharmaceutical fields; research	



	results analysis, pharmaceutical marketing and industry.	
1202331	Pharmaceutical Technology (1) Prerequisite: (1202230)	(2 Cr. Hrs.)
	Comprehensive survey of industrial processes used in the production of pharmaceuticals. Transfer processes and unit operation with emphasis on subjects of pharmaceutical interests especially tableting.	
1202332	Pharmaceutical Technology - Practical (1) Prerequisite: (1202331 or Co-Req)	(1 Cr. Hrs.)
	Covers the unit process operation (size reduction, mixing, granulation and tableting) in addition to quality control and pre-formulation; suggesting formula for certain drug knowing its physicochemical properties, formulation and evaluation using proper instruments.	
1203364	Pharmacology (2) Prerequisite: (1203363)	(3 Cr. Hrs.)
	Continuation of Pharmacology-1. Considers CNS pharmacology, local anesthetics, chemotherapy: antineoplastic, antibacterial, antiprotozoal, anthelmintic, antifungal, antiviral agents and immunomodulators.	
1203302	Immunology and genetics Prerequisite: (1203253)	(3 Cr. Hrs.)
	Overviews basic biologic mechanisms of immune system. Emphasizes drug allergies, autoimmune conditions, transplantation, immunodeficiency, monoclonal antibodies, other immunology-derived agents in diagnosis/treatment of diseases. Encompasses structure and function of genes and chromosomes, genetic variation, the chromosomal basis of human diseases, disorders of metabolism, immunogenetics, cancer genetics, genetic diagnosis and treatment.	
1202315	Pharmaceutical Instrumental Analysis Prerequisite: (1201201)	(2 Cr. Hrs.)
	Study of the basic instrumental methods used in the qualitative and quantitative analysis of pharmaceutical active and non-active chemicals in different dosage forms. In addition to analysis stated in the pharmacopoeias e.g. spectroscopy and chromatography.	
1201316	Pharmaceutical Instrumental Analysis - Practical Prerequisite: (1201315 Co-Req.)	(1 Cr. Hrs.)
	Practical application of instrumental methods. In addition, training on the interpretation of instrumental analysis results and applications of these methods in the elucidation of their structures and concentration determination of the studied samples.	
1201390	Chemistry of medicinal plants Prerequisite: (1201321)	(2 Cr. Hrs.)
	Biosynthesis, isolation and identification of the primary and secondary plant constituents and discussion of natural drugs containing these constituents. The main plant active constituents from chemical and pharmacological points of view will be	



	covered. Topics related to carbohydrate, lipids, phenolic compounds and alkaloids are also discussed.	
1202341	Pharmaceutical Microbiology (1) Prerequisite: (0304102)	(3 Cr. Hrs.)
	Basic information of microorganisms, their basic structure and mode of growth. Medical, pharmaceutical and environmental importance of some microorganisms. Basic principles of immunity and immunization. Anti-microbial chemotherapy: mode of action and prudent use.	
1200401	Pharmaceutical Field Training (1) Prerequisite: (1203364)	(2 Cr. Hrs.)
	Field training according to a prepared plan under direct supervision of a faculty member. Evaluation at the end of training.	
1203426	Therapeutics (1) Prerequisite: (1203364)	(3 Cr. Hrs.)
	Patho-physiology, symptoms and aims of treatment. In addition to the basic knowledge on the drugs used, kinetics drug interactions, dose calculations, side effects, treatment algorithms and patient awareness. The diseases of the following systems will be covered: cardiovascular, endocrine, GIT and rheumatic diseases.	
1203427	Case studies in Therapeutics (1) Prerequisite: (1203426 Co-Req.)	(1 Cr. Hrs.)
	Uses simulated clinical cases to develop the students ability to assess a patient's condition, determine reasonable treatment alternatives, select appropriate therapy and monitoring parameters and to justify those choices by utilizing knowledge and skills acquired in therapeutics (1).	
1201401	Medicinal Chemistry (1) Prerequisite: (1201215+1203364)	(3 Cr. Hrs.)
	Introduction to medicinal chemistry. Study of drug physicochemical properties, distribution, metabolism and excretion. In addition to structure activity relationships. Emphasis on drugs used for the treatment of some vital organs.	
1203471	Biopharmaceutics Prerequisite: (1202235)	(2 Cr. Hrs.)
	Study the factors influencing drug availability to the systemic circulation such as physicochemical properties of active ingredients, pharmaceutical dosage forms, physiological factors and routes of administration. Limitation and advantages of each route of administration of conventional and new drugs will be discussed. Drug distribution and elimination will also be covered.	
1202441	Pharmaceutical Microbiology (2) Prerequisite: (1202341)	(2 Cr. Hrs.)
	Study sterilization, disinfection, anti-sepsis, preservation and good manufacturing practice in the control of contamination. Methods used for the evaluation of antimicrobial efficacy and factors affecting it. Some applications of microorganisms in	



	pharmaceutical sciences.	
1202442	Pharmaceutical Microbiology – Practical Prerequisite: (1202441 or Co-Req.)	(1 Cr. Hrs.)
	Develop the skills of identifying microorganisms, measuring the efficacy and potency of different antimicrobial agents, using different sterilization methods. Designing optimum sterilization cycles. Techniques for microbial quality monitoring for both sterile and non sterile dosage forms.	
1203411	Clinical biochemistry (1) Prerequisite: (1203301)	(2 Cr. Hrs.)
	This course describes what happens 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 kidneys, the liver, disorders of carbohydrate metabolism, plasma proteins, clinical enzymology.	
1203405	Pharmacy practice (1) Prerequisite: (1203364)	(2 Cr. Hrs.)
	A course that introduces students to the concept and application of pharmaceutical care and develops skills in communication with health care professionals and patients.	
1203429	Therapeutics (2) Prerequisite: (1203346)	(3 Cr. Hrs.)
	Patho-physiology, symptoms and aims of treatment. In addition to the basic knowledge on the drugs use, kinetics drug interactions, dose calculations, side effects, treatment algorithms and patient awareness. The diseases of the following topics will be covered: infections, neurological diseases, blood diseases, tumors, respiratory diseases and kidney diseases.	
1203430	Case studies in Therapeutics (2) Prerequisite: (1203429 Co-Req.)	(1 Cr. Hrs.)
	Uses simulated clinical cases to develop the students ability to assess a patient's condition, determine reasonable treatment alternatives, select appropriate therapy and monitoring parameters and to justify those choices by utilizing knowledge and skills acquired in therapeutics (2).	
1201402	Medicinal Chemistry (2) Prerequisite: (1201401)	(2 Cr. Hrs.)
	Study of chemistry of drugs; chemical structure and mechanism of action. Antibiotics; their chemistry, mechanisms of actions and medical usesetc are extensively discussed.	
1203475	Pharmacokinetics Prerequisite: (1203471)	(2 Cr. Hrs.)
	Study of the pharmacokinetic concepts, terminology, models, factors affecting drug absorption, distribution, metabolism, excretion and its importance in drug activities and side effects. Emphasis will be placed upon the prediction of plasma levels of drugs under varying conditions applying different pharmacokinetic parameters.	



1203476	Case Studies in Pharmacokinetics Prerequisite: (1203475 Or Co-Req.)	(1 Cr. Hrs.)
	Handling pharmacokinetic parameters of drugs in the body and solving problems related to them through selected cases.	
1203412	Clinical biochemistry (2) Prerequisite: (1203411)	(2 Cr. Hrs.)
	This course is a continuation to Clinical Biochemistry (I) and covers the clinical aspects of diseases and their effect on body chemistry. Topics include endocrinology, lipids and lipoproteins, inherited metabolic diseases, metabolic aspects of malignant diseases and clinical chemistry at the extremes of age.	
1203406	Pharmacy practice (2) Prerequisite: (1203405)	(2 Cr. Hrs.)
	Includes medication history taking, physical assessment, constructing patient database, and drug therapy assessment.	
1201414	Complementary and alternative medicine Prerequisite: (1201390)	(3 Cr. Hrs.)
	Provides a review of the alternative and complementary therapies that are current and available (Homeopathy, aromatherapy, Reflexology therapy, etc...). Also covers a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine. In addition, it discusses the science of using herbal remedies and botanical extracts to treat illness and improve health with special emphasis on herbal therapy in Jordan. Contraindications of herbs and their interactions with drugs will be also discussed.	
1203401	Pharmacoeconomics Prerequisite: (1203364)	2 Cr. Hrs.)
	Methods and techniques for evaluating costs and cost-effectiveness of health, medical, and pharmaceutical interventions. Emphasis on economic evaluation, decision analysis, and modeling techniques for resource allocation and decision making. Applications to technology assessment, health policy, clinical practice, drug pricing policy and price control, drug expenditure, and resource allocation.	
1200402	Pharmaceutical Field Training (2) Prerequisite: (1203364)	(2 Cr. Hrs.)
	Field training according to a prepared plan under direct supervision of a faculty member. Evaluation at the end of training.	
1203504	Therapeutics (3) Prerequisite: (1203346)	(3 Cr. Hrs.)
	Will cover the pathophysiology, clinical presentations, pharmacotherapy (pharmacokinetics & pharmacodynamics, drug/drug interactions, dosage calculations, adverse effects, treatment algorithm, goals of therapy & patient education) of: women's health, pediatric and geriatric disorders.	
1203507	Case studies in Therapeutics (3)	1 Cr. Hrs.)



	Prerequisite: (1203504 Or Co-Req.)	
	Uses simulated clinical cases to develop the students ability to assess a patient's condition, determine reasonable treatment alternatives, select appropriate therapy and monitoring parameters and to justify those choices by utilizing knowledge and skills acquired in therapeutics (3).	
1203513	Pharmaceutical Promotion and Marketing (1) Prerequisite: (1203401)	(3 Cr. Hrs.)
	Principles of marketing and marketing concepts. Needs, exchange and communication process. Modern concept of marketing and influence of environment. Pharmaceutical marketing aspects and its applications in Jordan market emphasizing on sales call steps, selling skills and techniques.	
1203577	Clinical pharmacokinetics Prerequisite: (1203475)	(2 Cr. Hrs.)
	Involves the clinically-oriented Pharm.D. student in the process of clinical pharmacokinetic and pharmacodynamic monitoring of drug therapy. The course is concerned with the application of concepts and techniques of pharmacokinetics and pharmacodynamics to the rational design of individualized drug dosage regimens in the total clinical context, taking into account such special problems as hepatic and renal functional impairment, other effects of disease, immaturity of drug metabolizing enzymes, and drug interactions.	
1201515	Medicinal Chemistry (3) Prerequisite: (1201401)	(3 Cr. Hrs.)
	The study of the various classes of pharmacodynamic drugs. Their chemistry, mechanisms of action, pharmacological - clinical uses and structure-activity relationships	
1203516	Pharmacy practice (3) Prerequisite: (1203405)	(1 Cr. Hrs.)
	Includes pharmacotherapy planning, patient monitoring and education.	
1203562	Toxicology Prerequisite: (1203364)	(2 Cr. Hrs.)
	Introduction into epidemic, physiologic and symptoms of poisoning. In addition to treatment procedures of main toxic materials that human would be exposed to.	
1203506	Therapeutics (4) Prerequisite: (1203364)	(3 Cr. Hrs.)
	Will cover the pathophysiology, clinical presentations, pharmacotherapy (pharmacokinetics & pharmacodynamics, drug/drug interactions, dosage calculations, adverse effects, treatment algorithm, goals of therapy & patient education) of: general Care, dermatovenerology and Psychiatric disorders.	
1203507	Case studies in Therapeutics (4) Prerequisite: (1203506 or Co-Req.)	1 Cr. Hrs.)



	Uses simulated clinical cases to develop the students ability to assess a patient's condition, determine reasonable treatment alternatives, select appropriate therapy and monitoring parameters and to justify those choices by utilizing knowledge and skills acquired in therapeutics (4).	
1203517	Pharmacy Regulations and Ethics Prerequisite: (1203364)	(2 Cr. Hrs.)
	Introduction to existing laws and regulations governing the practice and ethics of pharmacy.	
1203518	Pharmaceutical literature evaluation Prerequisite: (1203364)	(2 Cr. Hrs.)
	Will enable students to identify, obtain, and utilize published medical literature to be used in patient care, research projects and lifelong learning. Emphasis on data searching and retrieval using computer database and written material.	
1203519	Pharmaceutical nutrition and diet therapy Prerequisite: (1203412)	(2 Cr. Hrs.)
	This course involves the study of nutrition in health and health care. It includes the foundation of nutrition, nutrition in health care throughout the lifecycle and nutrition in clinical care such as total parenteral nutrition, nutrition in diabetes mellitus, renal diseases, hypertension and cancer.	
1203563	Nonprescription Drugs Prerequisite: (1203363)	(2 Cr. Hrs.)
	Methods to assist the patient with optimal use of non-prescription drugs. Patients counseling regarding the proper and safe usage of drugs will be also discussed.	
1203601	Internal medicine clerkship (1) Prerequisite: (1203506)	(7 Cr. Hrs.)
	During this full-time advanced clinical pharmacy experience, the students will provide pharmaceutical care in inpatient settings: in neurology, rheumatology, nephrology and oncology-hematology for a minimum of three patients a week.	
1203603	Pediatric clerkship Prerequisite: (1203506)	(4 Cr. Hrs.)
	During this full-time advanced clinical pharmacy experience, the students will provide pharmaceutical care in inpatient and outpatient pediatric settings for a minimum of three patients a week.	
1203604	Psychiatric and geriatric clerkship Prerequisite: (1203506)	(2 Cr. Hrs.)
	During this full-time advanced clinical pharmacy experience, the students will provide pharmaceutical care in outpatient settings for a minimum of three psychiatric and geriatric patients a week.	
1203605	Gynecology and obstetrics clerkship Prerequisite: (1203506)	(2 Cr. Hrs.)



	During this full-time advanced clinical pharmacy experience, the students will provide pharmaceutical care in inpatients and outpatient settings for a minimum of three obstetric and gynecology patients a week.	
1203602	Internal medicine clerkship (2) Prerequisite: (1203506)	(7 Cr. Hrs.)
	During this full-time advanced clinical pharmacy experience, the students will provide pharmaceutical care in inpatient settings: in infectious diseases, cardiology, respiratory, and gastroenterology for a minimum of three patients a week.	
1203606	Surgery Clerkship Prerequisite: (1203506)	(2 Cr. Hrs.)
	During this full-time advanced clinical pharmacy experience, the students will provide pharmaceutical care in inpatient and outpatient surgery settings for a minimum of three patients a week.	
1203607	Clinical pharmacokinetics clerkship Prerequisite: (1203506)	(2 Cr. Hrs.)
	The clerkship in clinical pharmacokinetics is intended to allow Pharm.D. Students an opportunity to acquire the practical experience in the application of clinical pharmacokinetic principles to various drug therapies with emphasis on the selection and design of antimicrobial therapies. Students will learn how to apply these principles by gathering pertinent clinical information, development of pharmaceutical care and monitoring plans, thorough literature evaluation, and case discussions.	
1203608	Ambulatory care clerkship Prerequisite: (1203506)	(2 Cr. Hrs.)
	During this full-time advanced clinical pharmacy experience, the students will provide pharmaceutical care in outpatient settings: nephrology, rheumatology, respiratory, cardiology, gastroenterology, oncology-hematology, infectious diseases, neurology, dermato-venereology for a minimum of three patients a week.	
1203610	Research project Prerequisite: (1203506)	(1Cr. Hrs.)
	Introduction into proper methods for proposal preparation with application to a selected topic in the area of therapeutics and pharmaceutical care.	
1201531	Poisonous and Hallucinogenic Plants Prerequisite: (1203364)	(2 Cr. Hrs.)
	Identification and study of poisonous and hallucinogenic plants. In addition to symptoms, prophylactics and treatment. Emphasis is given on plants found in Jordan.	
1201522	Applied chromatography Prerequisite: (1201315)	(2Cr Hrs.)
	Includes the study of the modern methods of chromatography used in separation & purification of pharmaceutical compounds such as:-GC, DCCC, CCC, HPLC, SPE, Ion-Exchange Chromatography, Exclusion Chromatography and Affinity	



	Chromatography	
1202533	Pharmaceutical Radioisotopes Prerequisite: (1201401)	(2Cr. Hrs.)
	Brief discussion of radioactivity. The use of radioisotopes in medicine and pharmacy with precautions in their handling and storage.	
1201535	Pharmaceutical Biotechnology Prerequisite: (1201401)	(2 Cr. Hrs.)
	An introduction to replication and gene expression of prokaryotic and eukaryotic systems. In addition progress to cover recombinant (DNA) technology and cloning for the production of pharmaceuticals, followed by the application of (DNA) biotechnology including disease treatment, in vitro fertilization, and gene transfer.	
1202536	Cosmetics Science Prerequisite: (1202230)	(2 Cr. Hrs.)
	Covers the basics of cosmetic preparations, contents and their actions. (e.g. skin, hair and nail preparations).	
1202532	Selected Topics in Physical Pharmacy Prerequisite: (1203513)	(2Cr. Hrs.)
	Covers in detail topics like surface chemistry, colloid chemistry, preformulation and other related topics.	
1203514	Pharmaceutical Promotion and Marketing (2) Prerequisite: (1203513)	(2 Cr. Hrs.)
	Marketing strategy and marketing management. Environmental forces anticipation and contingency planning. Marketing plan development. Team work, time and stress management briefing. Some consumer behavior aspects.	
1213552	Parapharmaceuticals Prerequisite: (1203364)	(2 Cr. Hrs.)
	Basic knowledge to advise patients on medical/surgical appliances and devices, durable medical equipment, and prescription accessories, concerning their selection, use, and storage (e.g. cuts and burns products, thermometers ,contraceptives, diabetic supplies, diagnostics, and lens preparations	
1213563	Selected Topics in Clinical Toxicology Prerequisite: (1203562)	2 Cr. Hrs.)
	Deals with different types of human intoxication's. It will focus on the standard procedures undertaken in different cases of intoxication, identification of poisons, signs and symptoms, and their clinical manifestations.	
1202541	Selected Topics in Pharmaceutical Microbiology Prerequisite: (1202441)	(2 Cr. Hrs.)
	Application of microbiology in different field of pharmacy practice. Microbial resistance and policies used to control hospital acquired infections. Microbial quality control and its application in pharmaceutical industry. Application of microorganisms	



	in fermentation and genetic engineering.	
1203515	Pharmaceutical Intellectual Property Prerequisite: (1203401)	(2 Cr. Hrs.)
	General background of drug product life cycle, history, types and principles of intellectual property (IP) with an emphasis on the application of these principles within the pharmaceutical industry (PI), importance of intellectual property to the PI, research and development (R &D) issues internationally and locally. The world trading system, data exclusivity, patent protection, trade marks, Trade Related Aspects of Intellectual Property Rights (TRIPs) for pharmaceutical products and antitrust will be defined with case studies. Identifying potential commercial intellectual property: recording, ownership and registration of IP, strategies, planning and commercialization of IP, current and future impact of IP on the marketing strategies of Jordanian PI.	
1201370	Seminar in Pharmaceutical Sciences Prerequisite: (1201401+ 1201390)	(1 Cr. Hrs.)
	Preparation of a research project in pharmaceutical sciences under supervision of faculty member. Presentation and oral discussion are required.	
1201371	Seminar in Pharmaceutics and Pharmaceutical Technology Prerequisite: (1202331+ 1202341)	(1 Cr. Hrs.)
	Preparation of a research project in pharmaceutics and pharmaceutical technology under supervision of faculty member. Presentation and oral discussion are required.	
1203373	Seminar in Biopharmaceutics and Clinical Pharmacy Prerequisite: (1203429)	(1 Cr. Hrs.)
	Preparation of a research project in biopharmaceutics and clinical pharmacy under supervision of faculty member. Presentation and oral discussion are required.	