Aalborg Academy of Science

Faculty of Pharmacy

Study Plan for Doctor of Pharmacy (PharmD) Degree

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Vision:

Achieving excellence in Pharmaceutical education and Pharmaceutical care.

Mission:

The preparation of competitive efficient pharmacists through a distinct academic environment, promising scientific research and productive community partnership.

Objectives:

1. To provide students with the comprehensive scientific knowledge aPharmacists in different aspects of

Pharmaceutical sciences including clinical pharmacy and pharmacy practice in particular.

2. To provide students with high-quality practical training to develop the students' skills in the field of Clinical Pharmacy and to equip the students with the necessary skills to deal directly with patients in a cooperative environment with members of the medical team.
3. To provide the students with special professional knowledge and ethics needed for the profession of Pharmacy.
4. Graduating students with significant Pharmaceutical skills and knowledge needed to deliver the highest levels of pharmaceutical care for patients and providing the necessary knowledge for the optimal use of medicines.

Job Opportunities:

1. Public and private hospitals.
2. Community and hospital Pharmacies.
3. Pharmaceutical marketing/Science liaisons.
4. Drug information centers.
5. Pharmaceutical Industry.
6. Food and Drug Administration.
7. Academia.
8. Pharmaceutical research and development.
9. Medical websites.
10. International and national health organizations.

Study Plan of Doctor of Pharmacy Degree

Numbering and coding system of courses of the study plan.

Course Coding

The following codes are used to designate courses:

Faculty Specialization	Level/year	Field	Sequence
PHMD	x	y	z

Course Numbering

- The Pharmacy courses are tabled and numbered in such a manner to recognize each course regarding its subject area, year or level, and semester offered.
- Ex. PHMDxyz: The **PHMD** symbol in the course number denotes Doctor of Pharmacy and (xyz) is a 3-digit number:

A. The first digit denotes the year level of the course according to the student's study plan as follows:

Code	Level/year
1	First
2	Second
3	Third
4	Fourth
5	Fifth

6	Sixth

B. The second digit denotes the course field subject as follows:

Number	Specialization
0	General courses
1	Clinical Pharmacy
2	Medicinal Chemistry and Pharmacognosy
3	Medicinal Chemistry and Pharmacognosy
4	Clinical Pharmacy
5	Pharmaceutical Technology
6	Clinical Pharmacy
7	Pharmaceutical Technology
8	Clinical Pharmacy
9	Clinical Pharmacy

C. The third digit denotes the sequence of the semester during which the course is offered according to the study plan. In a way, those odd numbers are given to the first and summer semesters while even numbers are given to second semesters. Example: PHMD351Pharmaceutics 2 means:

PHMD	3	5	1
Doctor of Pharmacy	Level (Third year)	Field (Pharmaceutical Technology)	Sequence (First semester)

D. (*) labeling at course name indicates it is an online course, while (#) indicates a Project-based course. Examples: PHAR592 Epidemiology * and PHMD567 Toxicology#.

The Doctor of Pharmacy degree at JUST is awarded per the statute stated by JUST regulations for B.Sc. awarding issued by the Dean's Council based on the adjusted 1987 law for awarding scientific degrees and certifications at JUST after completing (210) credit hours successfully.
The study plan composed of the following:

Classification	Credit hours		
	Compulsory	Elective	Total
University requirement	16	9	25
Faculty requirement	23	9	32
Specialty requirement	137	16	153
Total	**176**	**34**	**210**

A. University Requirements (25 Credit Hours)

1. Compulsory University Requirements: include (16 Credit Hours) that are studied by all university students.

2. Elective courses: include (9 credit hours).

B. Faculty Requirements:

1. Mandatory courses (23 credit hours)

Course No.	Course title	Credit hours	Weekly	

		Theoretical	Practical	practical hours	Prerequisite or co-requisite
HSS103BT	General Biology	3	-	-	-
BT107	General Biology Lab	-	1	2	HSS103BTPre- or Corequisite
HSS103CHEM	General Chemistry	3	-	-	-
CHEM107	General Chemistry Lab	-	1	2	HSS103CHEMPre- or Corequisite
PHAR122	Introduction to Pharmacy	1	-	-	HSS103BT
PHAR124	Pharmaceutical Organic Chemistry	3	-	-	HSS103CHEM
CHEM262	Biochemistry	3	-	-	PHAR124
PH311	Biostatistics	2	-	-	PHAR122
MED230A	Human Physiology	3	-	-	HSS103BT
MED372	Pathophysiology	3	-	-	MED230A
Total		**21**	**2**	**4**	

2. Elective courses: Students must choose courses equivalent to (9) credit hours from the Faculty of Pharmacy elective courses as follows:

Course No.	Course title	Credit hours		Weekly practical hours	Prerequisite (or Corequisite)
		Theoretical	Practical		
PHAR504A	Selected Topics (1)	1	-	-	Dean's approval
PHAR504B	Selected Topics (2)	2	-	-	Dean's approval
PHAR521	Introduction to Scientific Research	3	-	-	PHMD462
PHAR522	Drug Design#	3	-	-	PHMD433
PHAR523	Synthetic Medicinal Chemistry	3	-	-	PHMD433
PHAR524	Computer-Aided Drug Design#	3	-	-	PHMD433
PHAR525	Bioanalysis	3	-	-	PHMD433
PHAR526	Advanced Instrumental Analysis	3	-	-	PHMD433
PHAR527	Functional Foods and Nutraceuticals	3	-	-	PHMD433
PHAR528	Complementary and Alternative Medicine	3	-	-	PHMD433
PHAR529	Drug Discovery from Nature	3	-	-	PHMD433
PHAR531	Elemental Analysis of Medicines	3	-	-	PHMD433
PHAR532	Biosensors	3	-	-	PHMD433
PHAR533	Selected Topics in Pharmaceutical and Biomedical Analysis	3	-	-	PHMD433
PHAR534	Medical Laboratory Testing	3	-	-	PHMD463
PHAR535	Poisonous Plants	3	-	-	PHMD433
PHAR551	Nanotechnology	3	-	-	PHMD451
PHAR552	Advanced Pharmaceutical Biotechnology	3	-	-	PHMD452
PHAR553	Advanced Pharmaceutical Microbiology	3	-	-	PHMD452
PHAR554	Gene Therapy#	3	-	-	PHMD452
PHAR555	Cosmetic Preparations	3	-	-	PHMD452
PHAR556	Stem Cell Therapy and Regenerative Medicine	3	-	-	PHMD452

PHAR557	Advanced Industrial Pharmacy	3	-	-	PHMD452
PHAR558	Vaccines Development and Formulations	3	-	-	PHMD452
PHAR559	Advanced Pharmacokinetics	3	-	-	PHMD452
PHAR586	Targeted Cancer Therapies	3	-	-	PHMD344
PHAR587	Drug Development: Introduction to Clinical Trials	3	-	-	PHMD344
PHAR589	Pharmaceutical Marketing	3	-	-	PHMD401
PHAR590	Advanced Pharmacology	3	-	-	PHMD344
PHAR591	Advanced Pharmacy Practice*	3	-	-	PHMD401
PHAR592	Pharmacoepidemiology*	3	-	-	PHMD462
PHAR593	Molecular Pharmacology	3	-	-	PHMD344
PHAR594	Clinical Examination	3	-	-	PHMD442
PHAR595	Pharmacogenetics	3	-	-	PHMD344
PHAR596	Hospital Pharmacy	3	-	-	PHMD401
PHAR597	Clinical Pharmacology	3	-	-	PHMD344
PHAR598	Pharmacy Management and Accounting	3	-	-	PHMD484
PHAR599	Public Health Toxicology	3	-	-	PHMD567

C. Program requirements: (137) credit hours allocated from the Faculty of Pharmacy as follows:

1. Mandatory courses (110 credit hours)

Course No.	Course title	Credit hours		Weekly practical hours	Prerequisite (or Corequisite)
		Theoretical	Practical		
PHMD202	Pharmacy Training 1	-	1	2	PHMD242 or Co-requisite
PHMD221	Pharmaceutical Analysis	3	-	-	PHAR124
PHMD224	Medicinal Chemistry 1	3	-	-	CHEM262 and PHAR124

PHMD226	Pharmaceutical Sciences Lab	-	1	2	PHMD224 or Co-requisite
PHMD242	Pharmacology 1	3	-	-	MED372 and PHAR122
PHMD251	Pharmaceutical Microbiology	3	-	-	MED230A
PHMD252	Pharmaceutics 1	3	-	-	PHMD221
PHMD323	Medicinal Chemistry 2	3	-	-	PHMD224
PHMD324	Medicinal Chemistry 3	3	-	-	PHMD323
PHMD332	Medicinal Natural Products	3	-	-	PHMD323
PHMD343	Pharmacology 2	3	-	-	PHMD242
PHMD344	Pharmacology 3	3	-	-	PHMD251 and PHMD343
PHMD345	Pharmacy Practice Lab	-	1	2	PHMD343 or Co-requisite
PHMD351	Pharmaceutics 2	3	-	-	PHMD252
PHMD354	Pharmaceutics 3	3	-	-	PHMD351
PHMD355	Biopharmaceutics and Pharmacokinetics	3	-	-	PHMD252
PHMD357	Drug Compounding Lab	-	1	3	PHMD354 or Co-requisite
PHMD358	Clinical Pharmacokinetics	3	-	-	PHMD355
PHMD371	Pharmaceutical Biotechnology	3	-	-	PHMD252
PHMD433	Phytotherapy	3	-	-	PHMD332
PHMD441	Therapeutics: Neurological and Psychiatric Disorders	2	-	-	PHMD344
PHMD442	Therapeutics: Endocrine and Renal Systems	2	-	-	PHMD443
PHMD443	Therapeutics: Respiratory and Gastrointestinal Systems	2	-	-	PHMD344
PHMD444	Therapeutics: Cardiovascular System	2	-	-	PHMD443
PHMD445	Clinical Skills Lab 1	-	1	2	PHMD441 or Co-requisite
PHMD446	Clinical Skills Lab 2	-	1	2	PHMD443 or Co-requisite
PHMD447	Clinical Skills Lab 3	-	1	2	PHMD442 or Co-requisite
PHMD448	Clinical Skills Lab 4	-	1	2	PHMD444 or Co-requisite
PHMD451	Compounding of Sterile Preparations Lab	-	1	2	PHMD354

PHMD452	Drug Delivery	3	-	-	PHMD354
PHMD461	Immunology and Vaccines	2	-	-	PHMD441
PHMD462	Drug Information and Clinical Literature Evaluation	3	-	-	PHMD344
PHMD463	Clinical Biochemistry	3	-	-	PHMD443
PHMD464	Public Health and Policy	3	-	-	PHMD344
PHMD465	Drug Information and Clinical Literature Evaluation Lab	-	1	2	PHMD462 or Co-requisite
PHMD482	Non-prescription Pharmaceuticals #	3	-	-	PHMD464
PHMD484	Simulation Pharmacy	-	1	2	PHMD482 or Co-requisite
PHMD540	Therapeutics: Critical Care Medicine	2	-	-	PHMD543
PHMD541	Therapeutics: Immunology, Hematology and Oncology	2	-	-	PHMD461
PHMD542	Therapeutics: Pediatrics Health	2	-	-	PHMD543
PHMD543	Therapeutics: Infectious Diseases	2	-	-	PHMD461
PHMD544	Therapeutics: Gynecological, Obstetrics and Urological Health	2	-	-	PHMD543
PHMD545	Clinical Skills Lab 5	-	1	2	PHMD541 or Co-requisite
PHMD546	Clinical Skills Lab 6	-	1	2	PHMD543 or Co-requisite
PHMD547	Clinical Skills Lab 7	-	1	2	PHMD540 or Co-requisite
PHMD548	Clinical Skills Lab 8	-	1	2	PHMD542 and PHMD544 or Co-requisite
PHMD562	Clinical Nutrition	2	-	-	PHMD541
PHMD564	Ethics and Communication Skills	3	-	-	PHMD565
PHMD565	Pharmacoeconomics and Pharmacy Administration	3	-	-	PHMD401
PHMD567	Toxicology #	2	-	-	PHMD444
PHMD572	Pharmaceutical Law and Regulatory Affairs	2	-	-	PHMD565
TOTAL		**95**	**15**	**31**	

2. Mandatory practical training (27 credit hours)

Course No.	Course title	Credit hours		Weekly practical hours	Prerequisite
		Theoretical	Practical		
PHMD401	Pharmacy Training 2$	-	3	40	Passing 130 credit hours
PHMD641	Advanced Experiential Training: Hospital	-	4	10	Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).
PHMD642	Advanced Experiential Training: Ambulatory Care$$	-	4	10	
PHMD643	Advanced Experiential Training: Internal	-	4	10	
PHMD644	Advanced Experiential Training: Pediatrics$$	-	4	10	
PHMD645	Advanced Experiential Training: Critical Care$$	-	4	10	
PHMD646	Advanced Experiential Training: Community Pharmacy$$	-	4	10	
TOTAL		**-**	**27**	**100**	

$: Students are trained for 8 consecutive weeks (320 practical hours, equivalent to 40 hours per week during the summer semester) in a registered community pharmacy inside Jordan. Students are not allowed to have training outside Jordan. Students are not allowed, under any circumstances, to register for courses along with the training. Students are eligible for this training only after successfully completing 130 credit hours.

$$: Students are trained for four consecutive weeks (160 practical hours, equivalent to 10 hours per week during the First and Second semesters).

D- Elective specialization requirements :(16 credit hours) selected from the following training courses:

Course No.	Course title	Credit hours		Weekly practical hours	Prerequisite
		Theoretical	Practical		
PHMD647	Advanced Experiential Training: Oncology$$	-	4	10	Passing 170 credit hours that include all theoretical
PHMD648	Advanced Experiential Training: Cardiology$$	-	4	10	

PHMD649	Advanced Experiential Training: Clinical Nutritional Support[$$]	-	4	10	(obligatory and elective) and practical requirements

PHMD661	Advanced Experiential Training: Geriatrics[$$]	-	4	10	(including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).
PHMD662	Advanced Experiential Training: Pharmaceutical Industry[$$]	-	4	10	
PHMD663	Advanced Experiential Training: Pharmaceutical Academic Education[$$]	-	4	10	
PHMD664	Advanced Experiential Training: Clinical Pharmaceutical Research[$$]	-	4	10	
PHMD665	Advanced Experiential Training: Family	-	4	10	
PHMD666	Advanced Experiential Training: Hospice and Palliative Care[$$]	-	4	10	
PHMD667	Advanced Experiential Training: Neurology and Psychiatry[$$]	-	4	10	
PHMD668	Advanced Experiential Training: Nuclear	-	4	10	
PHMD669	Advanced Experiential Training: Respiratory Diseases[$$]	-	4	10	
PHMD681	Advanced Experiential Training: Endocrine Diseases[$$]	-	4	10	
PHMD682	Advanced Experiential Training: Pain Management[$$]	-	4	10	
PHMD683	Advanced Experiential Training: Veterinary Pharmacy[$$]	-	4	10	
PHMD684	Advanced Experiential Training: Pediatric Oncology[$$]	-	4	10	

PHMD685	Advanced Experiential Training: Neonatal Intensive Care[$$]	-	4	10	
PHMD686	Advanced Experiential Training: Dermatology[$$]	-	4	10	
PHMD687	Advanced Experiential Training: Gynecology and Obstetrics[$$]	-	4	10	
PHMD688	Advanced Experiential Training: Drug Information[$$]	-	4	10	
PHMD689	Advanced Experiential Training: Surgery[$$]	-	4	10	
PHMD691	Advanced Experiential Training: Renal Diseases[$$]	-	4	10	
PHMD692	Advanced Experiential Training: Infectious Diseases[$$]	-	4	10	
PHMD693	Advanced Experiential Training: Poison Center[$$]	-	4	10	
PHMD694	Advanced Experiential Training: Gastrointestinal Diseases[$$]	-	4	10	
PHMD695	Advanced Experiential Training: Comprehensive Pharmaceutical care[$$]	-	4	10	
PHMD696	Advanced Experiential Training: Pharmaceutical Regulatory Affairs[$$]	-	4	10	
PHMD697	Advanced Experiential Training: Drug Development[$$]	-	4	10	

$$: Students are trained for four consecutive weeks (160 practical hours, equivalent to 10 hours per week during the First and Second semesters).

Study Plan

FIRST YEAR											
First semester						Second semester					
Course No.	Course name	Total credits		Weekly practical hours	Prerequisite/ Co-requisite	Course No.	Course name	Total credits		Weekly practical hours	Prerequisite/ Co-requisite
		Theoretical	Practical					Theoretical	Practical		
HSS103CHEM	General Chemistry	3	-	-	-	LG103	Life Skills	2	-	-	-
CHEM107	General Chemistry lab	-	1	2	HSS103CHEM or Corequisite	MS100	$ $ Military Sciences	3	-	-	-
HSS103BT	General Biology	3	-	-	-	HSS119	Entrepreneurship and Innovation	2	-	-	--
BT107	General Biology Practical	-	1	2	HSS103BTor Co-requisite	MED230A	Human Physiology	3	-	-	HSS103BT
HSS 110	Social Responsibility	3	-	-	-	PHAR122	Introduction to Pharmacy	1	-	-	HSS103BT
LG101	Communication Skills in English	3	-	-	Passing LG099$	PHAR124	Pharmaceutical Organic Chemistry	3	-	-	HSS103CHEM
ARB101	Arabic Language	3	-	-	-	-	University Elective	3	-	-	-
Total		**15**	**2**	**4**		**Total**		**17**	**-**	**-**	

$: Or scoring 50% or more in the English Language Level Exam

$$: Non-Jordanian Arabic-speaking students are required to take a substitute for this course.

SECOND YEAR									
First semester					Second semester				
Course No.	Course name	Total credits	Weekly	Prerequisite/		Course name	Total credits	Weekly	Prerequisite/

		Theoretical	Practical	practical hours	Co-requisite	Course No.		Theoretical	Practical	practical hours	Co-requisite
CHEM262	Biochemistry	3	-	-	PHAR124	PHMD224	Medicinal Chemistry 1	3	-	-	CHEM262 and PHAR124
PH311	Biostatistics	2	-	-	PHAR122	PHMD226	Pharmaceutical Sciences Lab	-	1	2	PHMD224 or Co-requisite
MED372	Pathophysiology	3	-	-	MED230A	PHMD242	Pharmacology 1	3	-	-	MED372 and PHAR122
PHMD221	Pharmaceutical Analysis	3	-	-	PHAR124	PHMD252	Pharmaceutics 1	3	-	-	PHMD221
PHMD251	Pharmaceutical Microbiology	3	-	-	MED230A	PHMD202	Pharmacy Training 1	-	1	2	PHMD242 or Co-requisite
-	University Elective	3	-	-	-	-	University Elective	3	-	-	-
Total		**17**	**-**	**-**		**Total**		**12**	**2**	**4**	

THIRD YEAR											
First semester						Second semester					
Course No.	Course name	Total credits		Weekly practical hours	Prerequisite / Co-requisite	Course No.	Course name	Total credits		Weekly practical hours	Prerequisite / Co-requisite
		Theoretical	Practical					Theoretical	Practical		
PHMD323	Medicinal Chemistry 2	3	-	-	PHMD224	PHMD324	Medicinal Chemistry 3	3	-	-	PHMD323
PHMD343	Pharmacology 2	3	-	-	PHMD242	PHMD332	Medicinal Natural Products	3	-	-	PHMD323
PHMD345	Pharmacy Practice Lab	-	1	2	PHMD343 or Corequisite	PHMD344	Pharmacology 3	3	-	-	PHMD251 and PHMD343
PHMD351	Pharmaceutics 2	3	-	-	PHMD252	PHMD354	Pharmaceutics 3	3	-	-	PHMD351
PHMD355	Biopharmaceutics and Pharmacokinetics	3	-	-	PHMD252	PHMD357	Drug Compounding Lab	-	1	3	PHMD354 or Co-requisite
PHMD371	Pharmaceutical Biotechnology	3	-	-	PHMD252	PHMD358	Clinical Pharmacokinetics	3	-	-	PHMD355
Total		**15**	**1**	**2**		**Total**		**15**	**1**	**3**	

FOURTH YEAR											
First semester						Second semester					
Course No.	Course name	Total credits		Weekly practical hours	Prerequisite/ Co-requisite	Course No.	Course name	Total credits		Weekly practical hours	Prerequisite/ Co-requisite
		Theoretical	Practical					Theoretical	Practical		
PHMD433	Phytotherapy	3	-	-	PHMD332	PHMD442	Therapeutics-Endocrine and Renal Systems	2	-	-	PHMD443
PHMD441	Therapeutics-Neurological and Psychiatric Disorders	2	-	-	PHMD344	PHMD444	Therapeutics-Cardiovascular System	2	-	-	PHMD443
PHMD443	Therapeutics-Respiratory and Gastrointestinal Systems	2	-	-	PHMD344	PHMD447	Clinical Skills Lab 3	-	1	2	PHMD442 or Co-requisite
PHMD445	Clinical Skills Lab 1	-	1	2	PHMD441 or Co-requisite	PHMD448	Clinical Skills Lab 4	-	1	2	PHMD444 or Co-requisite
PHMD446	Clinical Skills Lab 2	-	1	2	PHMD443 or Co-requisite	PHMD452	Drug Delivery	3	-	-	PHMD354
PHMD451	Compounding of Sterile Preparations Lab	-	1	2	PHMD354	PHMD461	Immunology and Vaccines	2	-	-	PHMD441
PHMD462	Drug Information and Clinical Literature Evaluation	3	-	-	PHMD344	PHMD463	Clinical Biochemistry	3	-	-	PHMD443
PHMD464	Public Health and Policy	3	-	-	PHMD344	PHMD482	Non-prescription Pharmaceuticals#	3	-	-	PHMD464
PHMD465	Drug Information and Clinical Literature Evaluation Lab	-	1	2	PHAR462 or Co-requisite	PHMD484	Simulation Pharmacy	-	1	2	PHMD482 or Co-requisite

Total	**13**	**4**	**8**		**Total**	**15**	**3**	**6**	

Summer semester					
Course No.	Course name	Credit hours		Weekly practical hours	Pre-requisite
		Theoretical	Practical		
PHMD401	Pharmacy Training 2$	-	3	40	Passing 130 credit hours
Total		**-**	**3**	**40**	

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FIFTH YEAR											
First semester						Second semester					
Course No.	Course name	Total credits		Weekly practical hours	Prerequisite / Co-requisite	Course No.	Course name	Total credits		Weekly practical hours	Prerequisite/ Co-requisite
		Theoretical	Practical					Theoretical	Practical		
PHMD541	Therapeutics- Immunology, Hematology and Oncology	2	-	-	PHMD461	PHMD540	Therapeutics- Critical Care Medicine	2	-	-	PHMD543
PHMD543	Therapeutics- Infectious Diseases	2	-	-	PHMD461	PHMD542	Therapeutics- Pediatrics Health	2	-	-	PHMD543
PHMD545	Clinical Skills Lab 5	-	1	2	PHMD541 or Corequisite	PHMD544	Therapeutics- Gynecological, Obstetrics and Urological Health	2	-	-	PHMD543
PHMD546	Clinical Skills Lab 6	-	1	2	PHMD543 or Corequisite	PHMD547	Clinical Skills Lab 7	-	1	2	PHMD540 or Co-requisite
PHMD565	Pharmacoeconomics and Pharmacy Administration	3	-		PHMD401	PHMD548	Clinical Skills Lab 8	-	1	2	PHMD542 and PHMD544 or Co-requisite
PHMD567	Toxicology#	2	-	-	PHMD444	PHMD562	Clinical Nutrition	2	-	-	PHMD541
-	Faculty Elective	3	-	-	-	PHMD564	Ethics and Communication Skills	3	-	-	PHMD565
-	Faculty Elective	3	-	-	-	PHMD572	Pharmaceutical Law and Regulatory affairs	2	-	-	PHMD565
						-	Faculty Elective	3	-	-	-
Total		**15**	**2**	**4**		**Total**		**16**	**2**	**4**	

Summer semester					
Course No.	Course name	Credit hours		Weekly practical hours	Pre-requisite
		Theoretical	Practical		
PHMD641	Advanced Experiential Training: Hospital Pharmacy$$	-	4	20	Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).
PHMD642	Advanced Experiential Training: Ambulatory Care$$	-	4	20	
Total		**-**	**8**	**40**	

$$: Students are trained for four consecutive weeks (160 practical hours, equivalent to 20 hours per week during the Summer semester).

SIXTH YEAR									
First semester					Second semester				
	Course name	Total credits	Weekly	Prerequisite		Course name	Total credits	Weekly	Prerequisite

Course No.		Theoretical	Practical	practical hours		Course No.		Theoretical	Practical	practical hours	
PHMD643	Advanced Experiential Training: Internal Medicine[$$]	-	4	10	Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).	PHMD645	Advanced Experiential Training: Critical Care[$$]	-	4	10	Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).
PHMD644	Advanced Experiential Training: Pediatrics[$$]	-	4	10		PHMD646	Advanced Experiential Training: Community Pharmacy[$$]	-	4	10	
-	Advanced Experiential Training: Elective [$$]	-	4	10		-	Advanced Experiential Training: Elective[$$]	-	4	10	
-	Advanced Experiential Training: Elective[$$]	-	4	10		-	Advanced Experiential Training: Elective[$$]	-	4	10	
Total		**-**	**16**	**40**		**Total**		**-**	**16**	**40**	

$$: Students are trained for four consecutive weeks (160 practical hours, equivalent to 10 hours per week).

important role of the pharmacists as part of the medical team. Familiarizing students with the process of drug development, regulation, and ethical foundations for the profession. The course discusses the scope of development in the practice of the profession, and the educational and career process of patient curriculum, its various fields of knowledge, and the training necessary to

This course is designed to provide students with a foundation in organic chemistry. Topics include an overview of organic functional groups with emphasis on the physicochemical properties of biological importance. Besides, the course covers essential cts in organic chemistry, including resonance, aromaticity, acidity, basicity, and stereochemistry of organic compounds.

Course Description

PHAR122:

Introduction to Pharmacy (1 credit hour)
A comprehensive introduction to the pharmacy profession including its history and the

opportunities available to pharmacists. The course also explains the role and influence o
care. Moreover, the course discusses the Pharmacy succeed in the field of pharmacy. *Prere*

PHAR124: **Pharmaceutical Organic Chemistry (3 credit hours)**

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Chemistry of aliphatic and aromatic heterocycles will be included throughout the course.
Prerequisite: HSS103CHEM

PHMD202:

Pharmacy Training 1 (1 credit hour)
This is an introductory training course that takes place in

and institutional simulated labs. The students will gain hands-on interby early exposure and engagement skills before advanced training in the following years of study. *Pre- or co-requisite: PHMD242*

PHMD221: Pharmaceutical Analysis (3 credit hours)
This course gives an overview of

volumetric analysis, in addition to the control of the
such as accuracy, precision, calibration standards, analytical errors,
of the most common analytical techniques used in pharmaceutical assays, clinical tests,
spectroscopic methods, mass spectrometry, chromatographic separation, *Prerequisite: PHAR124*

the 2nd year of the study. It provides
students with the opportunity to
observe and practice a variety of
professional activities in multiple
settings, including hospital,
community pharmacy, industry,
professional ethics, patients
communication, and activities
in regular services. This course prepares students to develop their professional education and

the analytical methodologies involved in pharmaceutical, clinical and biological applications.
The student will be introduced to the concepts of qualitative and quantitative analysis including chemical calculations and quality
of analytical methods in pharmaceutical and clinical laboratories and
method selection. The theory, operation, and application and bio-assays
will be discussed including
and immunoassays.
depth look at drugs' pharmacokinetics (absorption and metabolism) and pharmacodynamics, as well
as the influence of drugs' physicochemical properties on drug action. The concept of rational drug design and computer-aided
activity relationships of drugs acting on the central nervous

This course is a practicum designed to train students on the qualitative and quantitative aspects of pharmaceutical analysis, such as titration, chromatographic separation, in addition to techniques pertinent to extraction, isolation, synthesis, purification, and

PHMD224: **Medicinal Chemistry 1 (3 credit hours)**
This course provides an in-

drug design will be introduced. The course also explains the structuresystem and the autonomic nervous system. *Prerequisite: CHEM262 and PHAR124*

PHMD226: **Pharmaceutical Sciences Lab (1 credit hour)**

identification.
Pre- or co-requisite: PHMD224

PHMD242 **Pharmacology 1 (3 credit hours)**

the central nervous system, the autonomic nervous system, local anesthetics, and non*Prerequisite: MED372 and PHAR122*

PHMD 251: **Pharmaceutical Microbiology (3 credit hours)**
The course provides the
characteristics and classification of various microorganisms, including viruses, bacteria

the clinically used antibiotics, and their mode of action. The course also explains antimicrobial agents as well as the role of biofilm in resistance and its
sterilizing processes, disinfectants, antiseptics, preservatives, and their use to control the
Prerequisite: MED230A

Pharmaceutics 1 (3 credit hours)

PHMD 252:

This course is designed to provide students with the basic principles of pharmacology and an introduction to drugs' pharmacokinetics and pharmacodynamics. The course also provides students with the basic pharmacology of drugs acting on steroidal anti-inflammatory drugs.

basic pharmaceutical calculations. Students will learn about the colligative properties of sc
and buffer solutions. Comparison between the
Additionally, it provides information about factors affecting the dissolu

basics of microbiology and its pharmaceutical/medical importance. The course describes the
, and fungi. Moreover, it covers the
pathogenesis of microorganisms and their spread. In addition, it provides essentials for understanding the relationship between
the mechanisms of bacterial resistance to
impact on health. The students will be introduced to various
spread of microorganisms.

This course covers several topics in physical pharmacy, including solubility and solutions of electrolytes and nonelectrolytes and
the preparation of isotonic
ideal and real solutions and deviations from Raoult's law will be covered.
solubility of drugs, distribution phenomenon, and drug tion. Students will be introduced to the basic solution formulations for oral, ophthalmic, nasal, vaginal, and topical use . activity relationships, physicochemical properties, and pharmacological activities of drugs used steroidal, and steroidal anti-inflammatory drugs will be Besides, the concept of rational drug design and strategies applied during the drug development process will be

activity relationships, physicochemical properties, and pharmacological activities of
chemotherapeutic agents used to treat cancer, bacteria, fungi, and viruses. In addition, selected case studies will be discussed to

Prerequisite: PHMD221

PHMD 323:

Medicinal Chemistry 2 (3 credit hours)
The course covers the structureto treat cardiovascular disease, diabetes, allergy, and ulcer. Opioids, noncovered as well. covered via discussing selected case studies.
Prerequisite: PHMD224

PHMD 324: **Medicinal Chemistry 3 (3 credit hours)** The course covers the structure-

illustrate the concept of the rational drug design and strategies applied during drug devel
Prerequisite: PHMD323

PHMD 332:

Medicinal Natural Products

methods and approaches, and drug development. The use of various natural drugs in moc discussed.
Prerequisite: PHMD242

PHMD 343:

Pharmacology 2 (3 credit hours)

Additionally, this interactive course introduces the pharmacokinetics and gastrointe diseases. The basic principles of pharmacology covered in the course include receptor sign pharmacokinetics, drug interactions, and side effect profile. *Prerequisite: PHAR 242*

PHMD 344:

Pharmacology 3 (3 credit hours)

Provides basic information about nature as a source of drugs, different classes of natural products with an emphasis on secondary metabolites from plants and microorganisms. Also covered, are the role of natural products in drug discovery, drug discovery -day therapeutics will also be

antiviral, and antiparasitic drugs cytotoxic agents and pathway targeted therapies.
Prerequisite: PHMD251 and PHMD343

This course is designed to provide students with the basic pharmacology of drugs used in renal and cardiovascular diseases. pharmacodynamics of drugs used in respiratory and the mechanism of drugs' action,

This course is designed to provide students with the basic pharmacology of hormones and drugs acting on the endocrine system. The course discusses the pharmacology of chemotherapeutic agents including antibacterial, antimycobacterial, antifungal, . Moreover, the course focuses on the pharmacology of cancer therapeutic agents including in organizing patient-related data, solving treatmentthe necessary knowledge and prepare them to document recommendations and communicate with healthcare providers and patients. Presentations, lab to develop students' skills necessary to meet their career

This course covers the physical principles that affect the performance of different semisolid dosage forms, such as basics of rheology, phase equilibria and phase rules, and interfacial phenomena of liquid interfaces including adsorption at the solid-liquid liquid interfaces. It also provides students with the types, formulation, preparation, stabilization, packaging, and

PHAR 345:

Pharmacy Practice Lab (1 credit hour)
This practice lab is designed to provide students with skills necessary
related problems, and advancing medication safety. The lab setting will acquaint students

simulations, role plays, and various interactive activities will be applied goals. Students are
report medication errors and maintain a safe healthcare environment. *Pre- or co-requisite*

PHMD 351: **Pharmaceutics 2 (3 credit hours)**

and liquid-

gels, pastes), aerosols, and rectal and vaginal dosage forms.
Prerequisite: PHMD252

PHMD 354: **Pharmaceutics 3 (3 credit hours)**

diffusion, dissolution, chemical kinetics, particle size distribution, such as possible molecular modifications, bulk characterization, solubility, students with the formulation, manufacturing, forms is also covered in this course.
Prerequisite: PHMD351

PHMD 355: **Biopharmaceutics and Pharmacokinetics (3 credit hours)** This

extravascular or in the significance of pharmacokinetics in pharmacy practice, pharmacokinetic models pharmaceutical factors affecting the availability of drugs.
Prerequisite: PHMD252

applications of different dosage forms, including colloids, suspensions and emulsions, semisolid preparations (ointments, creams,

PHARD357: Drug Compounding Lab (1 credit hour)

This course familiarizes students with the physical principles that affect the performance of different solid dosage forms such as and surface area. It also covers the pre-formulation studies and stability analyses. The course also familiarizes and evaluation of tablets and capsules. Formulation of sustained release dosage

course includes a study of the physicochemical and biological factors involved in the absorption, distribution, and elimination of drugs as well as methods of calculating drug levels in blood and urine after single or multiple dosing by travenous routes. In addition, students will be introduced to the concepts of bioavailability and bioequivalence, , and the physiological and areas of interest needed in the fields of pharmaceutical technology. These areas include physical and and solubility enhancement techniques. It also covers the preparation and evaluation of pharmaceutical preparations such as solutions (oral, ear, nasal), suspensions, emulsions, semisolid -filled hard gelatin capsules is also

This course applies the basic principles of pharmacokinetic science to optimize dosing regimens in patients based on plasma monitoring (TDM). The students will be exposed to examples on drug classes from different categories based on their pharmacokinetic criteria. Students will learn how to deal with troubleshooting issues sing regimen adjustments needed based on TDM.

This course is designed to provide students with a comprehensive framework for various aspects of pharmaceutical regulatory aspects regarding biopharmaceuticals. The course will cover

This lab focuses on several
chemical principles such as acid-base equilibria, buffers,

preparations, suppositories, tablets, and capsules. Preparation of liquid preparations fron
pre covered in this lab.
Pre- or co-requisite: PHMD354

PHARD358: **Clinical Pharmacokinetics (3 credit hours)** concentration

data obtained from therapeutic drug

encountered in clinical setting and related to drug do
Pre- or co-requisite: PHAR355

PHARD371:

Pharmaceutical Biotechnology (3 credit hours)

biotechnology, including production, dosage forms, and
the key concepts relevant to protein therapeutics including molecular biology, pr
formulation development, protein therapeutics and the ethical and regulatory aspects
development and registration. *Prerequisite: PHMD252*

PHARD401: **Pharmacy Training 2 (3 credit hours)**
This course provides didactic material and practical training for 8 consecutive weeks rega
practice. It includes Jordan, under the supervision of diseases attributed to major thera
Upon completion of this course, students should be retail pharmacy settings,
administration, display, and purchasing skills. perform basic dispensing and counseling
the supervision of registered *Prerequisite: Students are eligible for this training only after p*
hours.

Phytotherapy (3 credit hours)

PHMD433: This course provides basic information on contraindications, herb-herb, and herbcontrol, and standardization of herbal produc

, and analytical procedures, and immunogenicity. Additionally, the course will highlight various classes of currently approved

the retail setting of community dispensing skills and developing patient counseling skills in registered community pharmacies in registered pharmacists. Topics in this course cover medications dispensed for the treatment of knowledgeable about In addition, students should be able to community pharmacists.

herbal medicine and products, including indications, proper dosing, precautions, drug interactions. Reliable information resources, regulatory status, assessment, quality ts are also included. Selected herbal medicines and dietary supplements acting on the digestive, respiratory, musculoskeletal, central nervous, cardiovascular, urinary, and endocrine systems will be also - stimulants will be covered as well.

The course focuses on pharmacotherapy of major neurological and psychiatric disorders in relation to the underlying pathophysiologic conditions of the patient using current treatment guidelines. Concepts of drug action, therapeutic indications, and evaluation of the therapeutic outcomes are discussed. The course aims to improve students' ability to identify and critically assess the relevant factors for patients' pharmacological and pharmacological

diseases in relation to the underlying pathophysiologic conditions of the patient using current treatment guidelines. Concepts of drug action, therapeutic indications, goals of treatment, and evaluation of the therapeutic outcomes are discussed. The course aims

discussed. Weight loss products, herbal products increasing disease resistance, and immu
Prerequisite: PHAR332

PHMD441: **Therapeutics: Neurological and Psychiatric Disorders (2 credit hours)**

goals of treatment, therapeutic plan, patient counseling, drug monitoring,

management, developing optimum pharmaceutical care plans encompassing nonapproaches of therapy, and offering alternative therapeutic options when needed.
Prerequisite: PHMD344

PHMD442: **Therapeutics: Endocrine and Renal Systems (2 credit hours)** The course focuses on pharmacotherapy of endocrine and renal

therapeutic plan, patient counseling, drug monitoring,

pharmaceutical care plans encompassing non-pharmacological and pha
alternative therapeutic options when needed. *Prerequisite: PHMD443*

PHMD443: **Therapeutics: Respiratory and Gastrointestinal Systems (2 credit hours)**
The course focuses on pharmacotherapy of major goals of treatment,

therapeutic plan, patient counseling, drug monitoring,

management, developing optimum pharmaceutical care plans encompassing nonapproaches of therapy, and offering alternative therapeutic options when needed.
Prerequisite: PHMD344

PHMD444: **Therapeutics: Cardiovascular System (2 credit hours)**

therapeutic plan, patient counseling, drug monitoring,

to improve students' ability to identify and critically assess the relevant factors for patients' management, developing optimum rmacological approaches of therapy, and offering

respiratory and gastrointestinal disorders in relation to the underlying pathophysiologic conditions of the patient using current treatment guidelines. Concepts of drug action, therapeutic indications, and evaluation of the therapeutic outcomes are discussed. The course aims to improve students' ability to identify and critically assess the relevant factors for patients' pharmacological and pharmacological

The course focuses on pharmacotherapy of major cardiovascular diseases in relation to the underlying pathophysiologic conditions of the patient using current treatment guidelines. Concepts of drug action, therapeutic indications, goals of treatment, and evaluation of the therapeutic outcomes are discussed. The course aims to improve students' ability to identify and critically assess the relevant factors for patients' management, developing optimum pharmacological and pharmacological approaches of therapy, and offering

This course introduces students to advanced clinical pharmacy skills related to neurological and psychiatric disorders in terms of patient assessment and disease management. Patient assessment skills include detailed patient history, relevant general interpretation of relevant tests of sensory and motor systems. This course will also improve students' ability to design patient-specific therapeutic regimens for real clinical cases through the

systems in terms of patient assessment and disease management. Patient assessment skills include detailed patient history, relevant general examination of disease clues, and training on skills related to the use of inhaler devices and monitoring drug safety and efficacy.

This course will also improve students' ability to design patient-specific therapeutic regimens for real clinical cases through the

pharmaceutical care plans encompassing nonalternative therapeutic options when needed.
Prerequisite: PHMD443

PHMD445: **Clinical Skills Lab 1 (1 credit hour)**

examination of disease clues, and training on skills related to the

application of contemporary clinical guidelines pertaining to neurological and psychiatric
Pre- or co-requisite: PHMD441

PHMD446: **Clinical Skills Lab 2 (1 credit hour)**
This course introduces students to advanced clinical pharmacy skills related to respirator gastrointestinal

application of contemporary clinical guidelines pertaining to respiratory and GI disorders
Pre- or co-requisite: PHMD443

PHMD447:

Clinical Skills Lab 3 (1 credit hour)
This course introduces students to advanced clinical pharmacy skills related to the

history, relevant general examination of disease clues, and training on skills related tc insulin regimen development, therapeutic drug monitoring, settin through the a contemporary clinical guidelines pertaining to endocrine and renal diseases. *Pre- o PHMD442*

Clinical Skills Lab 4 (1 credit hour)

PHMD448: This course introduces students to advanced clinical pharmacy skills related to the disease

clues, and training on skills related to the

application of contemporary clinical guidelines pertaining to cardiovascular diseases.
Pre- or co-requisite: PHMD444

most common endocrine and renal
disease
states and conditions in terms of
patient assessment and disease
management. Patient assessment
skills include detailed patient the use
of insulin devices, insulin dose and
drug dosing optimization in the kidney disease
g. This course will also improve students' ability to design patient-specific therapeutic regimens for real clinical cases

cardiovascular system in terms of patient
assessment and disease management. Patient assessment skills include detailed patient history, relevant general examination of
measurement of pulse, blood pressure, ECG, etc. This course will also improve
students' ability to design patient-specific therapeutic regimens for real cardiovascular disease clinical cases through the sterile formulations. Students will practice aseptic techniques and procedures that combining, admixing, diluting, pooling, to create sterile medications. Additionally, students will be trained to handle,
and dispense total parenteral nutrition preparations and dangerous medications such as allergens and

PHMD451:

Compounding of Sterile Preparations Lab (1 credit hour)
This lab covers the standards of compounding
must be followed within clinical settings for compounding sterile preparations, including reconstituting, repackaging, or altering drugs compound, chemotherapies. *Prerequisite: PHMD354*

PHMD452: **Drug Delivery (3 credit hours)**

and th

to the body from different routes of administration.
Prerequisite: PHMD354

PHMD461: **Immunology and Vaccines (2 credit hours)**
This course provides students with a broad overview of basic immunology, with deep insi

and function of key receptors including immunoglobulins, T cell receptors,

lymphocyte memory formation are emphasized, and connections to modern biomedic relation microbial pathogens (viruses, bacteria, and parasites), transplantation, overview mechanisms believed to be related to vaccine-
Prerequisite: PHMD441

PHMD462: **Drug Information and Clinical Literature Evaluation (3 credit hours)**

This course was designed to increase students' searching and evaluating skills in an efficient manne

students' ability to apply health informatics and promote patient-centeredness.
Prerequisite: PHMD344

PHMD463: **Clinical Biochemistry (3 credit hours)**

This course covers the fundamentals and principles of drug delivery and the applications of these fundamentals to develop controlled drug delivery systems. Students will be introduced to the various technologies and strategies used in drug delivery, e materials and approaches used in the design and fabrication of such delivery systems. Additionally, students will be familiarized with strategies and considerations in the design of different drug delivery systems that will optimize drug delivery

molecular details in areas of central importance to this field. The course will consider both innate and adaptive immunity and include the structure and innate pattern recognition receptors. The mechanisms of antibody formation and molecular aspects of cellular immunity, including T and B cell interactions and e highlighted with their to diseases and therapy. These include presentations and discussions of autoimmunity, immunity against major and tumor immunology. This course also provides an induced disease protection and vaccine development.

knowledge and skills needed for the provision of drug information with a major emphasis on retrieving drug information from various reliable resources. This course enables students to develop literature r and gain a better understanding of research design, implementation, and conclusion of interventional and observational research as well as the ethical research boundaries. This course can strengthen This course provides basic information related to biological and metabolic disturbances related to various disease states. The course provides information about biochemical diagnostic procedures that help in evaluating the efficiency of different body ns. Interpretations of biochemistry and the concentration of carbohydrates, lipids, proteins, electrolytes, blood gases, and enzyme activities are also discussed. Clinical cases are presented to help students to interpret laboratory findings.

values, contexts, principles, and frameworks of public health and policy. It also provides an introduction to public health, explores the history of public health, and gender, moral and legal foundations, and cultural competence, health and human rights, advocacy and health equity and alth concepts and issues in daily pharmacy practice, with an emphasis on applying the fundamental issues of public health within pharmacy practice.

orga

Prerequisite: PHMD443

PHMD464: **Public Health and Policy (3 credit hours)**
This course is concerned with introducing students to various resources and information

health determinants and measurements, impact of health disparities on race, class, public structures, historical trauma, the formulation and analysis of public health policies. St learn the importance of public he

Prerequisite: PHMD344

PHMD465: **Drug Information and Clinical Literature Evaluation Lab (1 credit hour)**
This course provides the
use of citation tools, literature review, Journal club, and evaluation of different study desig
Pre- or co-requisite: PHMD462

PHMD482:

Non-prescription Pharmaceuticals# (3 credit hours)

care. In
the pharmacy using over-thePrerequisite*:*
PHMD464

PHMD484: **Simulation Pharmacy (1 credit hour)**
This lab-

scenarios that demonstrate realmedication history, creating a patient profile, patient cour and therapeutic drug monitoring. *Pre- or co-requisite: PHMD482*

PHAR504A:

Selected Topics 1 (1 credit hour)

Prerequisite: Dean's approval

practical application of the basic concepts of clinical research. Students should learn skills related to the s in clinical settings.

This course introduces students to the concept of dispensing medications in the pharmacy without medical prescription and selfaddition, the course differentiates between cases that require the referral to the physician and those that be treated in counter medications and the proper counseling that should be offered to patients.

based course provides the needed training in simulated community and hospital pharmacy settings which provides opportunities for students to integrate basic science and pharmacy practice and apply pharmacy knowledge to case-based life. This course is intended to emphasize students' skills in pharmacy practice such as taking a

A selected topic in pharmaceutical sciences will be assigned to students to fulfill certain academic requirements. assigned to students to fulfill certain academic requirements.

This course provides undergraduate students with an introduction to scientific research. Topics relevant to scientific research will be covered, including literature search, essential software's in research, research ethics, scientific authorship, data agement, research misconduct, scientific writing, the publication process, and human participants and animal subjects in research. Moreover, the course will provide undergraduate students with the opportunity to practice academic writing and

-likeness concept, improving target binding thermodynamics and kinetics. The

PHAR504B: **Selected Topics 2 (2 credit hours)**
A selected topic in pharmaceutical sciences will be
Prerequisites: Dean's approval

PHAR521: **Introduction to Scientific Research (3 credit hours)**

man

present scientific topics.
Prerequisite: PHMD462

PHAR522:
Drug Design# (3 credit hours)
This course focuses on the concept of rational drug design and development emphasizing pharmacokinetic properties, optimizing drug-target interactions, and drugconventional applied in the lead-toas case studies.
Prerequisite: PHMD433

PHAR523:
Synthetic Medicinal Chemistry (3 credit hours)
This course covers in-depth organic

Prerequisite: PHMD433

PHAR524: **Computer-Aided Drug Design# (3 credit hours)**
This is an introductory course designed to provide students with the background and a hai aided drug design techniques, including molecular modeling, molecular simulation, drug mole particularly in lead identification and lead optimization, using freely availa
Prerequisite: PHMD433

PHAR525: **Bioanalysis (3 credit hours)** different settings. These analyses involve the study of mole proteins, peptides, DNA, and drugs.

drug optimization process will be discussed utilizing rational drug design literature

reactions and their synthetic utility in the field of synthetic medicinal chemistry. Total synthesis and retrosynthetic analysis of a selection of pharmaceuticals and natural products will be included in the course.

-on understanding of different
-target interactions and cular docking, and ADMET predictions that are integral to the process of drug design and development

This course covers the principles and analytical techniques used to separate, detect, identify, and quantify biological samples in This course builds on students' existing background in pharmaceutical instrumental analysis to develop both theory and practice relating to the latest analytical techniques used in the pharmaceutical industry and research. The course covers the theory, operation, instrumentation, and applications for selected major techniques. Analytical methods covered include separation mass spectrometry techniques, elemental

This course will outline the concept of functional foods, nutraceuticals, and dietary supplements, including their health benefits, development, and regulation. Moreover, the principles and processes necessary to evaluate their health claims and the potential

applications for the major domains of

Prerequisite: PHMD433

PHAR526: **Advanced Instrumental Analysis (3 credit hours)**

techniques (chromatography), mass spectrometry, hyphenated chromatographytechniques, and other analytical techniques used in pharmaceutical applications. *Prerequisite: PHMD433*

PHAR527: **Functional Foods and Nutraceuticals (3 credit hours)**

long-term effects of their usage will be covered.
Prerequisite: PHMD433

PHAR528: **Complementary and Alternative Medicine (3 credit hours)**
This course provides a foundation of the therapies and evidence-based clinical

complementary health approaches such as traditional Arab-

complementary and alternative medicine practices.
Prerequisite: PHMD433

PHAR529:

Drug Discovery from Nature (3 credit hours)
The focus of this course

including biochemistry- and molecular biology-based methods. Several the course.
Prerequisite: PHMD433

PHAR531:

Elemental Analysis of Medicines (3 credit hours) This course

absorption spectrosc
Prerequisite: PHMD433

complementary and alternative medicine practices in healthcare such as yoga, meditation, chiropractic, and acupuncture. Other
Islamic medicine, traditional Chinese medicine, Ayurveda, naturopathy, and homeopathy will be covered. Students will learn how to

evaluate the safety and effectiveness of the different

is to highlight the impact of natural products in the drug discovery and development process. Topics related to the different methods, approaches, and strategies utilized in discovering new drug leads from nature will be covered, unique drugs of natural origin will be highlighted during

will introduce the students to the various elemental analytical techniques used in pharmaceutical and medical applications. Both qualitative and quantitative techniques will be discussed. Techniques covered in the course include atomic opy, atomic emission spectroscopy, and inductively coupled plasma mass spectrometry.
This course will focus on biosensing technologies used for pharmaceutical and medical applications. Basic principles behind the operation of different biosensing devices will be covered. In addition, the different applications of biosensors will be discussed

This course will focus on recent advances and different applications of selected analytical methodologies in the pharmaceutical more detailed discussion of fundamental concepts, and the applications of analytical

procedures used in medical laboratory testing. Fundamentals of

Biosensors (3 credit hours)

PHAR532:

highlighting the advantages and limitations of each technique. *Prerequisite: PHMD433*

PHAR533: **Selected Topics in Pharmaceutical and Biomedical Analysis (3 credit hours)**

and biomedical fields. Topics will include a chemistry
in various disciplines.
Prerequisite: PHMD433

PHAR534: **Medical Laboratory Testing (3 credit hours)**
This course is an introduction to the basic theory and diagnostic

include blood, urine, of
data.
Prerequisite: PHMD463

PHAR535: **Poisonous Plants (3 credit hours)**
This course provides students with an opportunity to study several aspects related to mai
important

poisoning, treatment, and prevention. *Prerequisite: PHMD433*

PHMD540: Therapeutics: Critical Care Medicine (2 credit hours)
This course focuses on pharmacotherapeutic action,

therapeutic indications, goals o

factors for patients' management, deve pharmacological approaches of therapy, anc alternative therapeutic options when needed. *Prerequisite: PHMD543*

biochemical and analytical tests and procedures used in the analysis of clinical specimens will be covered. Topics to be covered and body fluid analysis, in addition to specimen processing, interpretation of test results, and quality control

poisonous, hallucinogenic, and narcotic plants. Topics include identifying poisonous plants, poisonous compounds, mechanisms of toxicity, clinical signs of

management of disease states and conditions commonly seen in critically ill patients in relation to the underlying pathophysiological characteristics of patients using current treatment guidelines. Concepts of drug f treatment, therapeutic plan, patient counseling, drug monitoring, and evaluation of the therapeutic outcomes are discussed. The course aims to improve students' ability to identify and critically assess the relevant loping optimum pharmaceutical care plans encompassing non-pharmacological and

The course focuses on pharmacotherapy of immunological and hematological diseases, and cancers in relation to the underlying pathophysiologic conditions of the patient using current treatment guidelines. Concepts of drug action, therapeutic indications, and evaluation of the therapeutic outcomes are discussed. The course aims to improve students' ability to identify and critically assess the relevant factors for patients' pharmacological and pharmacological

states commonly seen in pediatric patients in relation to the underlying pathophysiologic conditions of the patient using current treatment guidelines. Concepts of drug action, therapeutic indications, and evaluation of the therapeutic outcomes are

PHMD541: **Therapeutics: Immunology, Hematology and Oncology (2 credit hours)**

goals of treatment, therapeutic plan, patient counseling, drug monitoring,

management, developing optimum pharmaceutical care plans encompassing nonapproaches of therapy, and offering alternative therapeutic options when needed. *Prerequisite: PHMD461*

PHMD542:

Therapeutics: Pediatrics Health (2 credit hours) The course focuses on

pharmacotherapy of disease goals of treatment, therapeutic plan, patient

counseling, drug monitoring,

management, developing optimum pharmaceutical care plans encompassing nonapproaches of therapy, and offering alternative therapeutic options when needed. *Prerequisite: PHMD543*

PHMD543:

Therapeutics: Infectious Diseases (2 credit hours)

plan, patient counseling, drug monitoring,

pharmaceutical care plans encompassing nonalternative
therapeutic options when needed.
Prerequisite: PHMD461

PHMD544: Therapeutics: Gynecological, Obstetrics and Urological Health (2 credit hours)

The course focuses on pharmacotherapy of major disorders special to gynecologica

therapeutic indications, goals of treatment, therapeutic plan, patient counseling, drug mo

factors for patients' management, developing optimum pharmaceutical care plans en
pharmacological approaches of therapy, and offering alternative therapeutic options whe

discussed. The course aims to improve students' ability to identify and critically assess the relevant factors for patients' pharmacological and pharmacological

The course focuses on pharmacotherapy of major infectious diseases in relation to the underlying pathophysiologic conditions of the patient using current treatment guidelines. Concepts of drug action, therapeutic indications, goals of treatment, therapeutic and evaluation of the therapeutic outcomes are discussed. The course aims to improve students' ability to identify and critically assess the relevant factors for patients' management, developing optimum pharmacological and pharmacological approaches of therapy, and offering

, and urological diseases in relation to the underlying pathophysiologic conditions of the patient using current treatment guidelines. Concepts of drug action, g, and evaluation of the therapeutic outcomes are discussed. The course aims to improve students' ability to identify and critically assess the relevant -pharmacological and

This course introduces students to advanced clinical pharmacy skills related to immunological and hematological diseases, and cancers in terms of patient assessment and disease management. Patient assessment skills include detailed patient history, t general examination of disease clues, and training on skills related to dose calculations of chemotherapy and anemia management, drug monitoring, vaccination schedules, etc. This course will also improve students' ability to design patientapplication of contemporary clinical guidelines pertaining to

This course introduces students to advanced clinical pharmacy skills related to infectious diseases in terms of patient assessment and disease management. Patient assessment skills include detailed patient history, relevant general examination of disease measurement of vital signs, optimization of antimicrobial therapy, penicillin allergy,

Prerequisite: PHMD543

PHMD545: **Clinical Skills Lab 5 (1 credit hour)**

relevan

specific therapeutic regimens for real clinical cases through the immunological and hematological diseases, and cancers.
Pre- or co-requisite: PHMD541

PHMD546: **Clinical Skills Lab 6 (1 credit hour)**

clues, and training on skills related to the

application of contemporary clinical guidelines pertaining to infectious diseases.
Pre- or co-requisite: PHMD543

PHMD547: **Clinical Skills Lab 7 (1 credit hour)**
This course introduces students to advanced clinical pharmacy skills related to the

relevant general examination of disease clues, and training on skills related to intr therape mechanical ventilation parameters, and specific scales used in critical care setting also imp to design patient-specific therapeutic regimens for real clinical cases through contempora pertaining to Critical Care diseases.
Pre- or co-requisite: PHMD540

PHMD548: Clinical Skills Lab 8 (1 credit hour)

interpretation of microbiological culture and susceptibility results, antimicrobial stewardship, hospital antibiogram, etc. This course will also improve students' ability to design patient-specific therapeutic regimens for real infectious cases through the

chart pediatric
drug inf
pregnancy,

most common critical care disease states and conditions in terms of patient assessment and disease management. Patient assessment skills include detailed patient history, avenous calculations, dosage conversion, s. This course will the application of

This course introduces students to unique clinical pharmacy skills that are related to pediatrics, obstetrics/gynecology, and urology health settings in terms of patient assessment and disease management. Patient assessment skills include detailed patient history, relevant general examination of disease clues, and training on skills related to pediatric setting (use of /tables for measurement of vital signs and assessment of growth, understanding of medication use in children, use of ormation resources, etc) and obstetrics/gynecology and urology settings (rational selection of drugs during family planning/ provision of contraception, managing common urologic conditions such as *prostate* and . This course will also improve students' ability to design patient-specific therapeutic regimens for real application of contemporary clinical guidelines pertaining to the mentioned disease states.

This course gives the students basic knowledge about nanotechnology and its applications in the medical field. It covers the and the major types of nanoparticles used in nanomedicine.
Additionally, the course provides an overview of the drug delivery systems based on nanotechnology for the delivery of small and genes. Additionally, nanoparticulate systems used as antimicrobials, for healing are also reviewed, along with the toxicity, safety, as

The course provides a detailed perspective on recent approaches used to examine genomes and gene functions, ranging from throughput techniques. Attention is given to the genomic characterization of simple and ies. Various sequencing approaches and interpretative approaches using functional and comparative genomics are discussed. Transcriptomics (study gene expression) and Proteomics (separate and identify proteins) methods are also included.

incontinence *issues*, etc) cases
through the
Pre- or co-requisite: PHMD542 and PHMD544

PHAR551: **Nanotechnology (3 credit hours)** definition, history,

characterization, methods of preparation,

molecules, proteins, peptides, oligonucleotides, diagnosis and treatment of cancer, to treat infections, and for woundwell as environmental concerns related to nanoparticles used in the medical field. *Prerequisite: PHMD451*

PHAR552:

Advanced Pharmaceutical Biotechnology (3 credit hours)

classical genetics to the new highcomplex
spec

Additionally, students are introduced to the cloning basics and general Bioethical and regu
Prerequisite: PHMD452

PHAR553:

Advanced Pharmaceutical Microbiology (3 credit hours)

microbiological contamination of sterile and non-

Diseases, and their resistance towards antimicrobial agents.
Prerequisite: PHMD452

PHAR554: Gene Therapy# (3 credit hours)

This course is designed to provide students with a

production and formulation, delivery into target cell students will gain broad comprehension of designing treatment strategies for their use, and their mechanism of action. Additionally, the course will provide a issues related to strategies, techniques,

Prerequisite: PHMD452

This course is designed to introduce students to advanced topics in pharmaceutical Microbiology which have high relevance to pharmacy in all its aspects. It covers the manufacture and quality control of pharmaceutical products, sterilization, disinfection,

sterile pharmaceutical products, along with understanding bacterial resistance and the mode of action of antimicrobial agents and their clinical use against pathogenic bacteria, fungi, parasite, and viruses. Additionally, it familiarizes students with the various characters of bacterial biofilms in relation to their structure, pathogenicity,

comprehensive understanding of the rationale and the applications of gene therapies, with special emphasis on current technologies essential for their clinical use, such as molecular cloning techniques, s and tissues, and the challenges related to the use of biologics as drugs. The various diseases using gene drugs, the rationale of broad comprehension of regulatory and ethical

and the use of gene drugs as modern biomedical practice tools.

skin care products, raw materials and formulation proper use of these products. Topics include hair growth and morphology, , and conditioners. Additionally, it skin, sunscreens, bleaching agents, antiaging products, and skin their ingredients and basics of soap pharmaceutics.

the field of stem cells and their applications in modern pharmaceutical and biomedical fields. Students will be introduced to the key concepts in stem cell biology and mming and gene editing, and drug discovery. Significant emphasis will be on the promising therapeutic potential and the limitations of

PHAR555: **Cosmetic Preparations (3 credit hours)**
This course covers the basic pharmaceutical aspects regarding hair and
considerations, and the counseling essentials on the
straightening, depilation, coloring, and bleaching of hair, in addition to surfactants, sham
covers topics related to the anatomy and disorders of the
moisturizers. Students will also get knowledge on different types of soaps and
Prerequisite: PHMD452

PHAR556: **Stem Cell Therapy and Regenerative Medicine (3 credit hours)**
This course is designed to provide students with the knowledge and understanding of

differentiation, methodologies and tools for tissue and organ engineering and regeneratio
bioprocessing, stem cell therapy, particularly the ethical considerations of stem cell
Prerequisite: PHMD452

PHAR557: **Advanced Industrial Pharmacy (3 credit hours)**
This course covers the technical, administrative, and regulatory aspects of the and
quality systems. It is designed to familiarize the student with the

Additionally, it provides a comprehensive knowledge of engineering services and ware
Prerequisite: PHMD452

PHAR558: **Vaccines Development and Formulations (3 credit hours)** This
course provides an overview of the biological basis for the
and cancer vaccines. It covers the recent genomic and proteomic technologies for identifi

carrier systems and formulation strategies to enhance the delivery and presentation of sp
Prerequisite: PHMD452

PHAR559: Advanced Pharmacokinetics (3 credit hours)

pharmaceutical industry with various guidelines, manufacturing of various pharmaceutical dosage forms along with patent knowledge, material management, and various analytical techniques required to evaluate dosage forms. housing systems of pharmaceutical plants.

with cancer,

development and evaluation of new viral, bacteriologic, parasitic, , and evaluation of vaccine antigens, and the novel adjuvant to enhance vaccination efficacy. Additionally, it familiarizes students with the antigento effector sites.

This course will emphasize pharmacodynamics models and special populations that have modified body physiology which can result in different drug pharmacokinetics as compared to the healthy adult population. Among these populations are patients patients with renal impairment, patients with hepatic impairment, premature infants, geriatrics, and pregnant females. A full understanding of changes in the body physiology and biochemistry in these populations and the expected effects

biological basis of human nutrition and the role of nutrients in promoting health. This course also focuses on the special needs of people throughout the life in health and disease in addition to nutrition therapy of and cardiovascular diseases.

ethical concepts and key concepts related to patients' rights, confidentiality, and care in pharmacy pharmacy profession are a major focus

of these changes on drug pharmacokinetics and the possibility for dose adjustments will l
Prerequisite: PHMD452

PHMD562: **Clinical Nutrition (2 credit hours)** The course presents an overview of the

selected diseases such as upper and lowers gastrointestinal diseases, diabetes mellitus,
Prerequisite: PHMD541

PHMD564: **Ethics and Communication Skills (3 credit hours)**
This course discusses moral-
practice. Further, verbal, and non-verbal communication skills to prepare students for the

healthcare provider-patient interactions and enhances wellbeing.
Prerequisite: PHMD565

PHMD565: **Pharmacoeconomics and Pharmacy Administration (3 credit hours)**

competencies in healthcare decisionoutcomes. It covers the application of economicEffectiveness Analysis and Cost-Utility Anal regarding the roles of people, and managing risks. *Prerequisite: PHMD401*

PHMD567: **Toxicology# (2 credit hours)**
The course studies the body's response to drugs, foods, and toxic substances. This cours
principles of toxicokinetics and toxicodynamics derived from environmental, dietary, occu

based course that provides the chance for students to work in teams, search and present a
to their surrounding community. (This is a project-based course). *Prerequisite: PHMD444.*

PHMD572: Pharmaceutical Law and Regulatory affairs (2 credit hours)

of this course. Overall, this course focuses on principles, practices, and procedures necessary to establish a climate that fosters students' ability to promote positive health outcomes and patient

This course covers basic principles of pharmaceutical economics. This course supports the students' development of making through the understanding and assessment of economic, clinical, and humanistic based evaluation methods for pharmaceutical products and services (e.g., Costysis). In addition, this course aims to provide students with knowledge and skills
management in pharmacy practice focusing on personal management, operations management, managing

a comprehensive discussion
, and pharmaceutical
sources, first aid, common antidotes, and skills to deal with poisoning by drug and medical products. The course is a projecttoxic substances
This course introduces pharmacy laws that govern pharmacy practice in Jordan and the professional roles of pharmacists in industry regulations, good pharmaceutical
, and licensure. Students will be
become familiar with domestic regulatory

depth understanding of the molecular basics for the development and therapeutic use of targeted anticancer drugs. The course provides an overview of the basic concepts of signal transduction and cell signaling responsible for cer cell growth and proliferation. The course will also explain the intricate signaling pathways between cancer cells and the tumor microenvironment. A major emphasis will be given to discuss several classes of targeted anticancer drugs used in the nt of different neoplastic disorders that represent excellent examples of personalized medicine. These drug classes molecule kinase inhibitors, immune checkpoint inhibitors, signal transduction inhibitors,

medical and pharmaceutical institutions. In addition, it covers pharmaceutical
industry practices principles, ethical considerations, regulatory dossier sections prep
introduced to the vital role performed by regulatory professionals in pharmacy and requir
in Jordan and various regulatory agencies in other countries and their jurisdiction. *Prere*
PHMD565

PHAR586:

Targeted Cancer Therapies (3 credit hours)
This course provides an incan

treatme
include monoclonal antibodies, smalland apoptosis indications, and
the emergence and mechanisms of cancer resistance.
Prerequisite: PHMD344

PHAR587:

Drug Development: Introduction to Clinical Trials (3 credit hours) This
course is
It will describe the new drug development, drug discovery,
noncover assessments, efficacy assessments, and post-
marketing studies. *Prerequisite: PHMD344*

PHAR589:

Pharmaceutical Marketing* (3 credit hours)
The course is designed to teach Pharm D students how to promote their ideas, services, b

practices, develop innovative services, and generate business for employers or organizat

a full marketing plan for a new medication or pharmaceutical product.
Prerequisite: PHMD401

PHAR590:

Advanced Pharmacology (3 credit hours)

This course introduces the recently advanced principles of pharmacology and an

inducers. These drug classes will be discussed in terms of their development, pharmacodynamics, therapeutic

inMoreover

designed to introduce the lifecycle approach to drug development from early discovery to conducting clinical trials.

clinical research, the design, and conduct of clinical trials. It will

topics like different clinical trial designs, study conduct, clinical significance, sample size estimation, general safety

and products by identifying & meeting

the needs of customers. This course covers marketing fundamentals required to understand marketing ideas and techniques to

ions within the scope of pharmacy. In addition, the course provides the needed orientation to enhance students detailing in

pharmaceutical marketing and to design

depth assessment of selected groups of drugs.

, the current course provides specific emphasis on the sites and mechanisms of drug action, indications,

drug interactions. The course reviews signal transduction pathways and provides a

course is designed to assist students in utilizing knowledge, experience, and critical thinking to appropriately ensure pharmacy

practice. Students will be engaged

utilization reviews (DURs), blood pressure measuring, blood glucose testing, patient

and filling prescriptions throughout this course to enhance skill sets necessary to

emphasize the emerging roles of clinical

contraindications, adverse effects, and drugdetailed discussion of the molecular pharmacology of receptors, channels, and enzymes. *Prerequisite: PHMD344*

PHAR591: **Advanced Pharmacy Practice* (3 credit hours)**

This
effective and safe therapeutic options and achieve greater success in the advancedwith active-learning activities such as drug-
counseling, mocking scenarios revolve around drug-drug interactions, their clinical com will help acquire the pharmacy that have the potential to improve the quality of heal contribute to cost savings.
Prerequisite: *PHMD401*

PHAR592: **Pharmacoepidemiology * (3 credit hours)**

phar encountered in
pharmacoepidemiology.
Prerequisite: PHMD462

PHAR593:

Molecular Pharmacology (3 credit hours)
This course introduces the messengers, translation, and the control of
these processes as sites of drug action.
Prerequisite: PHMD344

PHAR594: **Clinical Examination (3 credit hours)**
This course covers medical terminologies and procedures used during physical examinati of

practical skills needed to detect clinical signs of disease.
Prerequisite: PHAR442

PHAR595:

Pharmacogenetics (3 credit hours)

This course addresses a range of study designs and analytic techniques for observational studies on the utilization, safety, and effectiveness of pharmaceuticals. Students will develop an understanding of how to plan, implement, analyze, and criticize macoepidemiologic studies. Lectures will provide methodological background and will cover applied issues typically

therapy, and health status. The course aims to provide students with variability in drug r
application of pharmacogenetics to drug development and treatment.

essential principles of molecular pharmacology. It also covers the types of receptors, second and cellular mechanisms of drug actions. This course discusses the structures of genes and nucleic acids, replication,

a patient's medical history. In addition, it aims to assist students in developing the consultation skills required to elicit a clear history, and the

This course will discuss how an individual's genetic inheritance affects the body's response to drugs. This course examines factors that affect drug response including genetics, as well as, additional factors such as environment, diet, age, and concurrent drug
an understanding of pharmacogenetics in the context of

depth understanding of institutional pharmacy practice. As it covers a detailed introduction of the practice of pharmacy in hospitals, including both professional and administrative activities. These activities
organization of the hospital pharmacy, management of people, use of technology, purchase and inventory control, the pharmacy and therapeutic committee, the hospital formulary, unit dose system, preparation of intravenous admixture services,

This course covers the essential principles of clinical pharmacology, clinical uses, adverse effects, precautions, drug interactions, and contraindications for selected groups of drugs. The course will review different features dealing with drug monitoring, reasons behind adverse effects development, and common aspects in clinical toxicology. Moreover, this course explains the for using certain drugs in clinical practice to treat pathological diseases based on the drugs' mechanism of action

Prerequisite: PHMD344

PHAR596:

Hospital Pharmacy (3 credit hours)
This course provides the students with an ininclude

the

medication safety, and how to conduct patient education and counseling.
Prerequisite: PHMD401

PHAR597:

Clinical Pharmacology (3 credit hours)

rationale
Prerequisite: PHMD344

PHAR598:

Pharmacy Management and Accounting (3 credit hours)
This course deals with accounting and technology,
payers' considerations, budgeting, applications in
specific pharmacy practice settings.
Prerequisite: PHMD484

PHAR599:

Public Health Toxicology (3 credit hours) public

health.

environmental exposures to toxic substances through case study presentations.
Prerequisite: PHMD567

PHMD641: **Advanced Experiential Training: Hospital Pharmacy (4 credit hours, 4 practical wee** Four weeks in the hospital pharmacy departments, which covers inpatient and outpatient

managerial aspects relevant to pharmaceutical organizations such as strategic planning, finance, and information systems. The course familiarizes the students with financial reports, third-party and personal finance. In addition, this course informs students about management

Students examine basic concepts of toxicology as they apply to the effects of environmental agents, e.g. chemicals, metals, on The course discusses the distribution, cellular penetration, metabolic conversion, and elimination of toxic agents, as well as the fundamental laws governing the interaction of foreign chemicals with biological systems. Students will be oriented on the application of these concepts to the understanding and prevention of morbidity and mortality resulting from

inventory, purchase, and storage. This rotation aims to advance the student's hospital pharmacy practice ability through clinical services and patient care -system pharmacy prescription processing, current standards of institutional pharmacy practice, purchasing and inventory control, quality assurance, medication use evaluation, medication reconciliation, medication safety, clinical pharmacy services, regulatory of drug distribution, disposal, controlled substances, investigational medication distribution, medical literature, *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

activities. This rotation will allow students to experience a variety of aspects of an institut
position -

requirements and others issues related to health-
system pharmacy.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD642: **Advanced Experiential Training: Ambulatory Care (4 credit hours, 4 practical weeks**
Four experiential training weeks in the
rounds, discussing clinical cases based on daily follow-up and monitoring, a

will extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD643: **Advanced Experiential Training: Internal Medicine (4 credit hours, 4 practical weel**
rounds, discussing clinical cases based on daily follow-up and monitoring, a

the positive contribution of clinical pharmacists in medical care at the ho will
extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD644: **Advanced Experiential Training: Pediatrics (4 credit hours, 4 practical weeks)**

discussing clinical cases based on daily follow-up and monitoring, a parents'
education, and interprofessional

will extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD645: Advanced Experiential Training: Critical Care (4 credit hours, 4 practical weeks)

outpatients' clinic department. This includes various activities such as attending morning detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills to enhance the positive contribution of clinical pharmacists in medical care at the hospital. This course provides the means by which students *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

Four experiential training weeks in an internal medicine department. This includes various activities such as attending morning detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance spital. This course provides the means by which students *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

Four experiential training weeks in a pediatrics department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' and/or interaction. The goal is to improve students' practical clinical skills that would enhance the positive contribution of clinical pharmacists in medical care at the hospital. This course provides the means by which students *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

. This includes various activities such as attending morning detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance spital. This course provides the means by which students *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

Four experiential training weeks in community pharmacies. This rotation advances the student's community practice ability through direct participation in clinical services and patient care activities. Students will demonstrate advanced patient n skills and assessment of patient comprehension level and level of understanding through community health

Four experiential training weeks in a critical care department/unit
rounds, discussing clinical cases based on daily follow-up and monitoring, a

the positive contribution of clinical pharmacists in medical care at the ho will extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD646: **Advanced Experiential Training: Community Pharmacy (4 credit hours, 4 practical**

communicatio

activities such as co practitioners, presenting health-related or drug-related topics to patients or groups of national meetings.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD647: **Advanced Experiential Training: Oncology (4 credit hours, 4 practical weeks)**

discussing clinical cases based on daily follow-up and monitoring, a

positive contribution of clinical pharmacists in medical care at the ho will extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD648: Advanced Experiential Training: Cardiology (4 credit hours, 4 practical weeks) Four experiential training weeks in a cardiology department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance the spital. This course provides the means by which students *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

PHMD647: Advanced Experiential Training: Oncology (4 credit hours, 4 practical weeks) Four experiential training weeks in an oncology department. This includes various activities such as attending morning rounds, detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance the spital. This course provides the means by which students *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

PHMD646: Advanced Experiential Training: Nutrition (4 credit hours, 4 practical weeks) on experience and various activities such detailed evaluation of drug therapy and the nutritional needs the nutritional status of hospitalized patients to efficiently calculate and prepare enteral and parenteral formulas. This course provides the means by discussing clinical cases based on daily follow-up and monitoring, a positive contribution of clinical pharmacists in medical care at the ho will extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2). presentations, patient instruction sessions, and patient education materials. This rotation offers the opportunity for specific nducting education programs for selected patient groups, conducting education programs for healthcare the public, and attending local and/or *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including

PHMD649: **Advanced Experiential Training: Clinical Nutritional Support (4**
Four experiential training weeks in the area of clinical nutrition. This includes handsas
attending grand rounds, presenting patients' medical problems, a
of patients, patients' education, and interprofessional interaction. Students will learn how

which students will extend their clinical knowledge and professional skills to practice as c
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD661:
Advanced Experiential Training: Geriatrics (4 credit hours, 4 practical weeks)

management of chronic diseases important in this age group. The rotation also focuses
information of people involved in the interprofessional teams (physicians, nurs
physiotherapists, etc).
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD662: **Advanced Experiential Training: Pharmaceutical Industry (4 credit hours, 4 practic**
Four experiential training
pharmaceutical industry and the role of key operational units in drug manufacturing proc

health care system, learn the most important drug manufacturing processes and the key e
control process that is required for quality and

assurance and good manufacturing practice.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

Advanced Experiential Training:

PHMD663:

concepts, theory, and application of teaching will be discussed. The c
in the laboratory setting or patient care management labs.

Four experiential training weeks in the areas of geriatrics. This is focused on establishing knowledge about aging and disease the delivery of medication-related management of geriatrics, including the elderly themselves, caregivers, and *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

)

weeks in the area of the pharmaceutical industry. This course provides an overview of the in major local pharmaceutical companies. This course enables the students to understand the role of the pharmaceutical industry in the global market and e formulation, and the regulatory compliance assurance. In addition, this course will provide the students with the opportunity to explore pharmaceutical research in research and development units and the procedures of quality *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

Pharmaceutical Academic Education (4 credit hours, 4 practical weeks)

Four experiential training weeks in the areas of pharmaceutical academic education. This training is designed for students who are interested and will be pursuing academic careers, as it aims to improve their teaching skills. An overview of the process, urrent curriculum at the faculty of Pharmacy will be used to identify lectures for students to work on platform skills, assessment, use of technology, as well as small group education, such as *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

Training: Clinical Pharmaceutical Research (4 credit hours, 4 practical weeks)

Four experiential training weeks in clinical pharmaceutical research. The course focuses on the spectrum of clinical research and the research process by reviewing the literature and highlighting epidemiologic methods, study design, proposal and protocol regulatory issues in human subject research, in addition to an overview

Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including

Four experiential training weeks in a family medicine department. This includes various activities such as attending morning
detailed evaluation of patient's drug therapy,

Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD664: **Advanced Experiential**

preparation, principles involved in the ethical, legal, and of basic bio-statistical and epidemiologic methods involved in conducting clinical research.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD665: **Advanced Experiential Training: Family Medicine (4 credit hours, 4 practical weeks**

rounds, discussing clinical cases based on daily follow-up and monitoring, a

the positive contribution of clinical pharmacists to medical care. This cou their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD666: **Advanced Experiential Training: Hospice and Palliative Care (4 credit hours, 4 pract**

monitoring, a

the means by which students will extend their clinical knowledge and skills to practice as
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD667: **Advanced Experiential Training: Neurology and** Four experiential training weeks in the areas morning rounds, discussing clinical cases based on daily follow-up and monitoring, a enhance the positive contribution of clinical pharmacists in medical care at the ho students will extend their clinical knowledge and skills to practice as clinical pharmacists. patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance rse provides the means by which students will extend *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

Four experiential training weeks in hospice care facilities found in hospitals, nursing homes, ambulatory care facilities, and others. This includes various activities such as attending morning rounds, discussing clinical cases based on daily follow-up and detailed evaluation of patient's drug therapy, patients' education, and interprofessional and interdisciplinary interactions. The goal is to improve students' practical clinical skills in aspects such as pain management and end-of-life care that would enhance the positive contribution of clinical pharmacists in medical care at the hospice care facilities. This course provides

Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including

Psychiatry (4 credit hours, 4 practical weeks) of neurology and psychiatry. This includes various activities such as attending detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would spital. This course provides the means by which

Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including

clinical pharmaceutical care in nuclear medicine. Nuclear pharmacists are responsible for handling radiopharmaceutical drugs in terms of procurement, compounding, dispensing, and education of healthcare workers shadow nuclear pharmacists during their work in specialized institutions.

Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including

Four experiential training weeks in the area of respiratory diseases. This includes various activities such as attending morning
detailed evaluation of patient's drug therapy,

Prerequisite: PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD668:

Advanced Experiential Training: Nuclear Medicine (4 credit hours, 4 practical week
Four experiential training weeks in

handling radiopharmaceuticals. Students will *Prerequisite: PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).*

PHMD669:

Advanced Experiential Training: Respiratory Diseases (4 credit hours, 4 practical w

rounds, discussing clinical cases based on daily follow-up and monitoring, a

the positive contribution of clinical pharmacists in medical care at the ho will extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD681:

Advanced Experiential Training: Endocrine Diseases (4 credit hours, 4 practical we

rounds, discussing clinical cases based on daily follow-up and monitoring, a

the positive contribution of clinical pharmacists in medical care at the ho will extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD682: Advanced Experiential Training: Pain Management (4 credit hours, 4 practical wee

rounds, discussing clinical cases based on daily follow-up and monitoring, a

the positive contribution of clinical pharmacists in medical care at the ho will extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance spital. This course provides the means by which students *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

Four experiential training weeks in the area of endocrine diseases. This includes various activities such as attending morning detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance spital. This course provides the means by which students *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

Four experiential training weeks in the area of pain management. This includes various activities such as attending morning detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance spital. This course provides the means by which students

Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including

Training: Veterinary Pharmacy (for Pharm D students; 4 credit hours, 4 practical weeks)

veterinary pharmacy for students who lack previous experience in this specialized sector. The course involves training about compounding techniques, drug knowledge, veterinary science, diseases and drug therapy together with a visit to the University's Animal House. It will provide background

information to allow students to respond to requests for advice regarding veterinary medicines and to know which products can

Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including

practical weeks)

Four experiential training weeks in the area of pediatric oncology. This includes various activities such as attending morning
detailed evaluation of patient's drug therapy,
patients' and/or parent education, and interprofessional interaction. The goal is to improve students' practical clinical skills that
care at the hospital. This course provides the means

Advanced Experiential

PHMD683: This course is designed to provide an introduction to the and

conditions in animals,

be used in veterinary care in collaboration with the college of veterinary medicine.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD684: **Advanced Experiential Training: Pediatric Oncology (4 credit hours, 4** rounds,

discussing clinical cases based on daily follow-up and monitoring, a

would enhance the positive contribution of clinical pharmacists in medical by which stu
extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD685: **Advanced Experiential Training: Neonatal Intensive Care (4 credit hours, 4 practica**

rounds, discussing clinical cases based on daily follow-up and monitoring, a

enhance the positive contribution of clinical pharmacists in medical care at students wil
extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD686: Advanced Experiential Training: Dermatology (4 credit hours, 4 practical weeks) *Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including*

based on daily follow-up and monitoring, a

contribution of clinical pharmacists in medical care at the ho their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

Four experiential training weeks in neonatal intensive care units. This includes various activities such as attending morning detailed evaluation of patient's drug therapy,

patient's family education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would the hospital. This course provides the means by which

Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including

Four experiential training weeks in the area of dermatology. This includes various activities such as discussing clinical cases detailed evaluation of patient's drug therapy, patients' education, and

interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance the positive spital. This course provides the means by which students will extend

Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including

Four experiential training weeks in the area of gynecology and obstetrics. This includes various activities such as attending detailed evaluation of patient's drug

therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would spital. This course provides the means by which

Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including

Four experiential training weeks in a drug information center. Students will gain professional skills as a provider of drug information. The course affords students the opportunity to effectively participate in the process of responding to drug requests from other healthcare providers and potential patients. Emphasis will be placed on how to properly receive drug information requests, conduct a systematic literature search and review, and assimilate the information obtained into an esponse. Students will develop an enhanced appreciation of the different types of information resources and

Advanced Experiential Training: Gynecology and Obstetrics (4 credit hours, 4 pract

PHMD687:

morning rounds, discussing clinical cases based on daily follow-up and monitoring, a

enhance the positive contribution of clinical pharmacists in medical care at the ho students will extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD688: **Advanced Experiential Training: Drug Information (4 credit hours, 4 practical week**

information appropriate

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guidelines summarization, writing brochures, and discussing journal club.
Prerequisite: Passing 170 credit hours that include all
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD689:

Advanced Experiential Training: Surgery (4 credit hours, 4 practical weeks)

discussing clinical cases based on daily follow-up and monitoring, a

positive contribution of clinical pharmacists in medical care at the ho will extend their clinical knowledge and skills to practice as clinical pharmacists.
Prerequisite:
PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD691: **Advanced Experiential Training: Renal Diseases (4 credit hours, 4 practical weeks)**

Four experiential training weeks in the area of renal disease. This includes various activities such as attending morning rounds, discussing clinical cases based on daily follow-up and monitoring, a detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance the positive contribution of clinical pharmacists in medical care at the hospital. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Prerequisite: Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD692: **Advanced Experiential Training: Infectious Diseases (4 credit hours, 4 practical weeks)**

Four experiential training weeks in the area of infectious disease. This includes various activities such as attending morning rounds, discussing clinical cases based on daily follow-up and monitoring, a detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance the positive contribution of clinical pharmacists in medical care at the hospital. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Prerequisite: Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD693: Advanced Experiential Training: Poison Center (4 credit hours, 4 practical weeks)

Four experiential training weeks in a poisoning center. Students will gain information about poison control, and in particular having the facilities for diagnosis, treatment, and prevention of poisoning. Also, students will learn how to prevent poison exposure, save lives and limit injury from poisoning through the dissemination of poison information and treatment advice, public and professional education, and scientific research, and to minimize adverse effects of exposures to drugs, poisons, chemicals, and natural toxins. Obtain emergency information on drug overdose, any household/chemical or pesticide exposure, any gas inhalation, animal/insect bite, or sting.

Prerequisite: Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD694: Advanced Experiential Training: Gastrointestinal Diseases (4 credit hours, 4 practical weeks)

Four experiential training weeks in the area of gastrointestinal disease. This includes various activities such as attending morning rounds, discussing clinical cases based on daily follow-up and monitoring, a detailed evaluation of patient's drug therapy, patients' education, and interprofessional interaction. The goal is to improve students' practical clinical skills that would enhance the positive contribution of clinical pharmacists in medical care at the hospital. This course provides the means by which students will extend their clinical knowledge and skills to practice as clinical pharmacists.

Prerequisite: Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD695: Advanced Experiential Training: Comprehensive Pharmaceutical Care (4 credit hours, 4 practical weeks)

Four experiential training weeks in the area of comprehensive pharmaceutical care. This training supports the students' development of the essentials of practicing pharmaceutical care. The training focuses on enhancing a student's ability to provide patient-centered pharmacy care services such as disease management, medication therapy management (MTM), preventative health screening, immunizations, patient education, and other advanced patient care activities. This rotation employs role-play simulation cases to develop essential skills for practicing pharmaceutical care.

Prerequisite: Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD696: Advanced Experiential Training: Pharmaceutical Regulatory Affairs (4 credit hours, 4 practical weeks)

Four experiential training weeks in Drug Regulatory Authority institution. Students will work directly with drug regulatory team and develop a basic understanding of the regulations that govern conducting clinical trials and investigational drugs registration and approval. Students will develop a broad understanding of the proper acquisition, documentation, storage, handling, dispensing of investigational drugs for active clinical trial protocols, and the compliance to quality and regulatory standards.

Prerequisite: Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).

PHMD697: Advanced Experiential Training: Drug Development (4 credit hours, 4 practical weeks)

Four experiential training weeks in the area of pharmaceutical drug development through training in pharmaceutical research centers. It offers students the opportunity to have better understanding of the whole drug development process by joining research teams working on different stages of drug development. During this course students will gain practical knowledge about the basic steps in the pharmaceutical development from early drug discovery to bringing the drug candidate to the market. Students are expected to spend their time in one or more of the different stages of drug development including discovery and development, preclinical research, clinical research, regulatory review, manufacturing, and the post-market safety monitoring. *Prerequisite: Passing 170 credit hours that include all theoretical (obligatory and elective) and practical requirements (including PHMD 202 Pharmacy Training 1 and PHMD 401 Pharmacy Training 2).*