Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY for MEDICALS & APPLIEED SCIENCES

Faculty of Clinical Pharmacy

Doctor of Pharmacy (Pharm.D.) Program Specification Document

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Head of Department | Quality Unit | Dean of the Faculty | Center of Development & Quality Assurance | Rector

1. Basic and general Information about the program	
Program Title	Doctor of Pharmacy Program
Awarding Institution	21 September University for Medical & Applied Sciences
Institution responsible for the program	Faculty of Clinical Pharmacy
Program type	Single
Language of Instruction	English
Year of study in the program	Six Years
Mode of delivery	Regular
Teaching Institution	Faculty of Clinical Pharmacy
System of study	Semester Based System
Duration of study	Complete 208 credit hours for Doctor of Pharmacy (Pharm. D.)
Final Award/s available	Bachelor's degree
Award title	Bachelor of Doctor of Pharmacy (Pharm. D.) Degree
Prerequisite Qualification for admission to the program	Secondary School Certificate (Scientific Section)
Average Grade for Joining the program	As per the admission rules made by Ministry of Higher Education and Scientific Research, Republic of Yemen, and university rules.
Other requirements	N/A
Coordinator	**Dr. Ali Alyahawi** (Ass. Professor of Clinical Pharmacy & Therapeutics)
Last date of accreditation	N/A

2. Program Overview:

This program graduates high-quality professional pharmacy practitioners. These practitioners possessing the pharmacotherapeutic knowledge, skills, abilities, behaviors, and attitudes necessary to provide patient-centered pharmaceutical care and educate the healthcare professionals about the manner in which drug therapy optimizes health care outcomes. The Bachelor of Pharm.D. is 6 years, five years of academic study and one year of hospital residency. The graduate student from this program should be completed 208 credits hours.

3. Vision, Mission & Aims of the University.

University Vision:
A Contemporary University with a Sense of National Responsibility and Faith Identity
University Mission:
Leadership of transformation/upturning headway in managing and providing the health care with all partners via having the distinction standard in education and applied and medical researches that meet the needs of Yemeni people and regional influence
University Strategic Objectives:
1- Ensuring the application of quality standards and having the distinction standards in medical and applied sciences, scientific research and community service.
2- Adopting student-centered learning, the partnership with them for life, consolidating the principles of national responsibility and faith identity, looking after them and developing their capabilities after graduation and during work.
3- Attracting and Eemploying scientists, cadres and talents to gain minds and put an end for the "brain drain" in a way that promotes and ensures the availability of thinkers, businessmen and good citizens.
4- Developing the distinguished academic infrastructure continuously and establishing modern research and service centers with high efficiency that can give a real effect locally and regionally.
5- Enhancing the university status as a preferred partner for local, regional and international partnership through implementing creative styles of education, exchanging researches and knowledge, and providing real and effective outcomes for developing professional practices to benefit from them locally and regionally.

4. Vision, Mission & Aims of the Faculty of Clinical Pharmacy.

Faculty Vision:
A contemporary college of clinical pharmacy, capable of competitiveness Locally and Regionally.
Faculty Mission:
Preparing distinguished pharmacists scientifically and practically qualified through modern academic programs and achieve excellence in pharmacy education, pharmaceutical research, and community service to meet the requirements of Yemeni society in a professional context.

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Faculty Objectives:
1- Produce graduates capable of provision of high-quality pharmacy care services.
2- Graduate pharmacists with all scientific knowledge and skills needed to make therapeutic decisions and evaluate drug information based on evidence-based principles.
3- Qualifying pharmacist capable of manufacturing and analyzing all forms of pharmaceutical preparations with their various sources in accordance with GLP and GMP standards.
4- Graduate pharmacists with all basic information to manage human and material resources effectively and communicate ethically with health care workers based on scientific principles.
5- Graduate pharmacists with basic skills of the scientific research and the use of medication in the health care system.
6- Effective contribution to community service and meeting the requirements of the labor market.

5. Program Standards & Benchmarks.

A. Academic Standards:

1. Criteria for Accrediting in Yemen council of academic accreditation .

B. Government Rules and Regulations:

1. Act No. 13/2005 of the Law of private universities, higher institutes and colleges, Yemen.
2. The executive regulations of Act No. 13/2005 of the Law of private universities, higher institutes and colleges, Yemen.

C. Similar Programs:

1- University of Science and Technology, Faculty of Pharmacy, Department of Clinical Pharmacy, Doctor of Pharmacy Program, Yemen. **HTTPS://UST.EDU/USTY/AR/COMPONENT/K2/ITEM/1895-2016-05-04-13-13-51**

2- Jordan University of Science & Technology (JUST), Faculty of Pharmacy, Department of Clinical Pharmacy, Doctor of Pharmacy Program.
https://www.just.edu.jo/FacultiesandDepartments/FacultyofPharmacy/Pages/viewplan.aspx?planno=456

3- Faculty of Pharmacy, Al King Faisal University, Doctor of Pharmacy Program. **https://www.kfu.edu.sa/en/Colleges/clinical_pharmacy/Pages/Program.aspx**

4- Gulf Medical University, Doctor of Pharmacy Program. **https://gmu.ac.ae/college-pharmacy/**

5- The University of Iowa, College of Pharmacy, Doctor of Pharmacy (Pharm D) **https://pharmacy.uiowa.edu/pharmd**

6. Mission & Aims of the Program.

Program Mission:

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The program aims to provide the highest standards of patient-centered pharmaceutical care that develop and improve the professional skills necessary to prepare and qualify graduates who are able to provide evidence-based solutions to treatment-related problems and improve the quality of patient care locally and regionally.
Aims of the Program:
1. Graduate distinguished pharmacists with professional essential skills such as teamwork, leadership, creative thinking, and work ethics.
2. Providing students with basic and professional knowledge leading to the Pharm D degree
3. Provide students with professional abilities to provide patient-centered care through the provision of safe and effective medicines
4. Provision of continued pharmaceutical education and participation in the field of scientific publications
5. Participate in process of improving professional qualification and competency locally, regionally, and internationally.

7. Graduate Attributes of the program

Upon successful completion of an undergraduate Bachelor of Pharm. D. program, the graduates will be able to:
1. Demonstrate scientific knowledge and principles of chemical, biomedical, microbiological, physiological, pathological, behavioral, and other basic sciences related to the pharmacy profession.
2. Integrate knowledge from fundamental sciences necessary for handling, disposing of, preparing, compounding, and analyzing parenteral nutrition, I.V admixtures, and small-batch preparation.
3. Provide legally and ethically patient education, appropriate advice, and counseling services about safe, rational, cost-effective use of natural/ synthetic medicines, complementary therapies, and over-the-counter products using endorsed professional protocols.
4. Demonstrate the responsibilities and roles of the pharmacist in contributing to the health care system of society considering pharmacovigilance, pharmacoeconomics and pharmacoepidemiological factors, and legal, ethical, and professional rules.
5. Apply patient-centered care as the medication expert (collect and interpret evidence, identify drug-related problems, prioritize, and formulate assessments and recommendations, implement, monitor, and adjust plans, and document activities).
6. Work as part of a team with self-assurance, interpersonal collaboration, and communication, leadership time management, professionalism, critical thinking, creativity, innovation, problem-solving, entrepreneurship, and decision-making ability.
7. Demonstrate self-commitment to independent and lifelong learning through evaluating medical literature, conducting pharmaceutical research in pharmacy settings, and updating information.
8. Track the continuous updates concerning new therapeutic guidelines, regulations, and evidence-based medicine that are recently introduced

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8. Program Intended Learning Outcomes (PILOs)

❖ PILOs of Knowledge and Understanding Skills:

Upon successful completion of an undergraduate Bachelor of Pharm. D. program, the graduates will be able to:
A1. Recognize the fundamental knowledge from scientific knowledge and principles of chemical, biomedical, microbiological, physiological, pathological, behavioral, and other basic & clinical sciences related to the pharmacy profession.
A2. Demonstrate the essential knowledge about physicochemical and pharmacokinetic properties of medicines and their influence on compounding, evaluation, analysis, route of administration, and dosage regimen.
A3. Recognize broad knowledge about the mechanism of action, effectiveness, use, safety, side effects, and interactions of natural and synthetic medicines.
A4. Define the pharmacist's roles in medication therapy management services including non-prescription medications, natural health products, and devices.
A5. Recognize the advanced concepts of professional (ethics, policies, laws, regulations requirements, management pharmacovigilance, pharmacoepidemiology, pharmacoeconomic, pharmacoinformatic, …..etc) to optimize the therapeutic outcomes.
A6. Recognize the requirements of research and sources of information related to medicines and pharmaceutical care.
A7. Recognize the role of pharmacists in patient care; dispensing, designing, implementing, monitoring, evaluating, and adjustment of medication therapy plans that are patient-specific and evidence-based to achieve maximum clinical effectiveness.

❖ PILOs of Intellectual Skills:

Upon successful completion of an undergraduate Bachelor of Pharm. D. program, the graduates will be able to:
B1. Integrate the physicochemical properties of medicines to compounding and preparation and analysis of total parenteral nutrition I.V admixtures and small-batch preparation.
B2. Predict the drug properties, including absorption, distribution, metabolism, excretion, and interaction with targets in the body, from molecular structure.
B3. Merge the pharmacological knowledge about natural and synthetic medicines with policies, information systems, workforces, service delivery, pharmacovigilance, Pharmacoepidemiology, and pharmacoeconomic factors to enhance the healthcare systems.
B4. Presume research topics in all pharmaceutical fields to improve drugs utilization, health outcomes, and wellness.
B5. Compare various therapeutic options based on evidence medicine of efficacy, safety, and cost for each

drug-related problem.
B6. Formulate an appropriate pharmacotherapy care plan and monitoring strategies for preventing and solving encountered drug-related problems through utilization of pharmacodynamic, pharmacokinetic properties of medicines as well as diseases pathophysiology and patient clinical data.

❖ PILOs of Professional Skills and Practices :
Upon successful completion of an undergraduate Bachelor of Pharm. D. program, the graduates will be able to:
C1. Deal safely and effectively with synthetic/natural pharmaceutical materials/products used in pharmaceutical preparations.
C2. Compound/prepare extemporaneous, cytotoxic, I.V admixture, total parenteral nutrition, and small-batch pharmaceutical preparation taking into account the physicochemical properties of drug structures.
C3. Contribute to strategies of medication management including monitoring and improving medicines use.
C4. Utilize scientific literature, results of pharmaceutical research, and information interpretation to enhance professional decisions.
C5. Implement patient-oriented pharmaceutical care legally and ethically in a variety of patient care settings in collaboration with patients and other health care professionals according to professional standards and appropriate therapeutic guidelines.
C6. Contribute to pharmaceutical research studies and clinical trials needed to optimize medicine use in specific medical conditions

❖ PILOs of General and Transferable Skills:
Upon successful completion of an undergraduate Bachelor of Pharm. D. program, the graduates will be able to:
D1. Develop leadership, time management, critical thinking, problem-solving, communication, independence, creativity, innovation, entrepreneurial, delegation, and organizational skills
D2. Demonstrate skills in documenting and recording relevant information, findings, decisions, recommendations, and other information accurately and concisely, taking due account of privacy and confidentiality.
D3. Develop life-long learning, in particular an awareness of the need for continuing education, research, scholarship, and professionalism in the field of pharmaceutical practice.

9. Annex- 1, Curriculum Map

Year	Term	Course Name	Course Code	CH	Program Intended Learning Outcomes (PILOs)																				
					A. Knowledge and understanding							B. Intellectual Skills						C. Practical & Professional Skills						D. Transferrable Skills		
					A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D1	D2	D3
		Islamic Culture	06.11.205	2																					
	1	English Language	06.11.203	4	☑																				
		Arabic language	06.11.201	4																					
		General Chemistry	02.04.243	2	☑		☑					☑												☑	
		Medical Physics	06.11.208	2	☑		☑					☑													
		Medical Terminology	04.01.218	2	☑		☑																		
		Fundamentals of Nursing	04.01.217	3	☑													☑					☑	☑	☑	
1		Medical Ethics	05.02.224	2	☑						☑	☑														
	2	Biochemistry-I	03.01.207	2	☑		☑						☑	☑				☑							☑	
		Histology	01.01.202	3	☑							☑														
		Fundamentals of Nutrition	03.01.208	2	☑							☑						☑	☑							
		Anatomy	01.01.201	3	☑							☑														
		Computer Skills	05.03.221	3	☑																			☑		
		Communication skills	05.01.220	2					☑															☑	☑	☑
		Physiology-I	01.01.203	2	☑							☑														

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		General Microbiology	03.02.210	3	☑								☑						☑					☑	☑	
2	1	~~Biochemistry-II~~	~~03.01.213~~	~~3~~	☑		☑						☑	☑				☑							☑	
		Molecular Biology	03,01,315	2	☑								☑						☑					☑	☑	
		Fundamental of Immunology	03.02.211	2	☑							☑						☑						☑		
		General Pathology	01.01.205	3	☑						☑						☑	☑						☑	☑	
		Parasitology	03.04.212	3	☑						☑	☑					☑	☑								
		Physiology II	01.01.206	2	☑												☑									
		Pharmacology-I	02.03.236	2	☑		☑		☑		☑		☑	☑			☑			☑					☑	
	2	Biochemistry-III	03.01.216	3	☑		☑						☑	☑				☑							☑	
		Pharmaceutical Organic Chemistry-I	02.04.244	3	☑			☑				☑	☑	☑				☑	☑					☑	☑	
		Medical statistics	05.02.222	2	☑					☑					☑		☑							☑	☑	☑
		Pharmaceutical Analytical Chemistry	02.04.246	3	☑	☑						☑	☑					☑	☑					☑		
		Physical Pharmacy	02.02.227	3	☑							☑	☑						☑							
		Pharmaceutical analytical chemistry (2)	02.04.247	3	☑	☑				☑		☑	☑		☑			☑	☑					☑		
		Pharmaceutics-I	02.02.229	3	☑		☑	☑			☑			☑	☑		☑	☑	☑		☑		☑			☑
3	1	Pharmacognosy	02.04.249	3			☑	☑				☑	☑	☑				☑	☑							

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		Pharmaceutical Organic Chemistry-II	02.04.245	3	☑			☑				☑	☑	☑				☑	☑						☑	☑
		Pharmacology-II	02.03.237	2	☑		☑				☑		☑							☑				☑		☑
		Clinical Nutrition	02.01.211	2	☑							☑						☑	☑							
		Phytochemistry	02.04.264	3			☑	☑				☑	☑	☑				☑	☑							☑
		Pharmacology-III	02.03.238	2	☑		☑				☑		☑							☑	☑	☑		☑		☑
		Medicinal Chemistry-I	02.04.248	3		☑	☑				☑	☑	☑			☑			☑	☑			☑			
	2	Pharmaceutics-II	02.02.231	3	☑		☑	☑			☑			☑	☑		☑	☑	☑		☑		☑		☑	
		Pharmaceutical Instrumental Analysis	02.04.251	3	☑	☑				☑		☑	☑		☑			☑	☑		☑		☑	☑	☑	☑
		Biopharmaceutics	02.02.230	2		☑						☑	☑													
4		Therapeutics (1)	02.01.212	3	☑		☑	☑	☑		☑		☑	☑		☑	☑		☑	☑	☑	☑	☑	☑	☑	☑
		Hospital Pharmacy	02.01.213	2			☑	☑			☑		☑	☑			☑	☑		☑	☑					☑
		Pharmaceutics-III	02.02.234	3	☑		☑	☑			☑			☑	☑		☑	☑	☑		☑		☑		☑	☑
		Community Pharmacy	02.01.216	4	☑				☑				☑				☑			☑	☑			☑		
	1	Medicinal Chemistry II	02.04.250	3		☑	☑				☑	☑	☑			☑			☑	☑			☑		☑	☑
		Pharmacology-IV	902.03.23	2	☑		☑				☑		☑							☑	☑	☑		☑		☑
		Therapeutics (2)	02.01.215	3	☑		☑	☑	☑		☑		☑				☑			☑	☑			☑	☑	
		Pharmaceutical Care	02.01.217	2					☑	☑	☑			☑			☑					☑		☑	☑	☑

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	2	Basic Pharmacokinetics	02.01.214	2	☑	☑											☑						☑		☑	
		Research Methodology	05.02.223	2		☑				☑					☑		☑					☑		☑	☑	☑	☑
		Drug Information Resources	02.02.232	2		☑				☑				☑	☑		☑							☑	☑	☑
		Clinical Biochemistry-I	03.01.215	2	☑		☑						☑	☑				☑							☑	
5	1	Clerkship-I	02.01.221	5	☑		☑	☑	☑		☑		☑	☑		☑	☑		☑	☑		☑	☑	☑	☑	☑
		Pharmaceutical promotion and marketing	02.02.235	2					☑					☑		☑				☑	☑			☑	☑	☑
		Therapeutics (3)	02.01.218	3	☑		☑	☑	☑		☑		☑	☑		☑	☑		☑	☑		☑	☑	☑	☑	
		Pharmacology-V	02.03.240	2	☑		☑				☑		☑							☑				☑		☑
		Clinical. Immunology	03.02.216	2	☑		☑				☑	☑						☑						☑		
		Clinical. Microbiology	03.02.215	2	☑		☑						☑					☑								
		Pharmacy Practice (1)	02.01.219	2			☑	☑	☑	☑	☑					☑	☑			☑	☑			☑	☑	☑
		Pharmacoepidemiology and Pharmacoeconomics	02.02.233	2					☑					☑						☑	☑			☑	☑	
	2	Clinical Pharmacokinetics	02.01.223	3	☑	☑											☑						☑		☑	
		Toxicology	02.03.242	2	☑		☑		☑		☑			☑		☑			☑							
		Therapeutics (4)	02.01.220	3	☑		☑	☑	☑		☑		☑	☑		☑	☑		☑	☑		☑	☑	☑	☑	☑
		Therapeutics (5)	02.01.222	2	☑		☑	☑	☑		☑		☑	☑		☑	☑		☑	☑		☑	☑	☑	☑	☑
		Clerkship (2)	02.01.225	5	☑		☑	☑	☑		☑		☑	☑		☑	☑		☑	☑		☑	☑	☑	☑	☑

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			Research Project	02.01.226	2		☑				☑					☑		☑				☑		☑	☑	☑	☑
			Pharmacy Practice (2)	02.01.224	2			☑	☑	☑	☑	☑					☑	☑			☑	☑			☑	☑	☑
			Pharmaceutical Biotechnology	02.03.241	2	☑		☑				☑	☑						☑						☑	☑	☑
6	1	Clerkship-I	Hospital Training: Internal Medicine-I	02.05.252	10	☑				☑			☑			☑	☑			☑	☑		☑	☑	☑	☑
			Hospital Training: Ambulatory care	02.05.253																							
		Clerkship-II	Hospital Training: Pediatric	02.05.254	7	☑				☑			☑				☑			☑	☑			☑	☑	☑
			Hospital Training: Hospital Pharmacy	02.05.255																							
			Hospital Training: Oncology care	02.05.256																							
	2	Clerkship-I	Hospital Training: Internal Medicine-II	02.05.257	9	☑				☑			☑							☑				☑	☑	☑
			Hospital Training: Intensive Care Unit	02.05.258																							
		Clerkship-II	Hospital Training: Surgery	02.05.259	8	☑			☑	☑			☑			☑	☑			☑	☑			☑	☑	☑
			Hospital Training: Gynecology & Obstetrics	02.05.260																							
			Hospital Training: Psychiatric	02.05.261																							

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10. Annex- 2,Alignment of Faculty Objectives with Program Intended Learning Outcomes for Pharm.D. Program:

Program PILOs	Faculty Objectives					
	FObj1	FObj2	FObj3	FObj4	FObj5	FObj6
A1	√	√		√		
A2	√	√	√			
A3	√	√				
A4	√			√		
A5	√	√		√		
A6	√				√	√
A7	√	√			√	√
B1	√		√			
B2	√	√	√			
B3	√			√	√	√
B4	√	√			√	
B5	√	√			√	√
B6	√	√		√	√	√
C1	√		√	√		
C2	√		√	√		√
C3	√	√		√		√
C4	√	√			√	
C5	√	√		√	√	√
C6	√	√			√	√
D1	√	√		√	√	√
D2	√	√			√	
D3	√	√		√	√	√

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11.Annex-3,Alignment of Program Intended Learning Outcomes (PILOS) to Program Objectives (POs)

#	Program Objectives	Program Intended Learning Outcomes (PILOs)																				
		A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D1	D2	D3
1.	Graduate distinguished pharmacists with professional essential skills such as teamwork, leadership, creative thinking, and work ethics.	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
2.	Providing students with basic and professional knowledge leading to the clinical pharmacy degree		√	√	√	√	√	√	√	√	√	√	√	√	√				√	√	√	√	√
3.	Provide students with professional abilities to provide patient-centered care through the provision of safe and effective medicines	√	√			√		√		√	√		√	√	√				√		√	√	
4.	Provision of continued pharmaceutical education and participation in the field of scientific publications						√	√	√		√								√		√	√	√
5.	Participate in the process of improving professional qualification and competency locally, regionally, and internationally.	√				√	√	√				√	√	√			√	√	√	√	√	√	√

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12. Annex-4, Themes of Courses of Study and their Weightage

No.	Themes	Compulsory Courses		Elective Courses		Percentage of Cr. Hrs.
		No. of Courses	Cr. Hrs.	No. of Courses	Cr. Hrs.	
1	Univ. Requirements	5	15	-	-	7.2 %
2	\Faculty Requirements	7	16			7.7 %
3	Department Requirements	38	94+2 CH Community Pharmacy Training	-	-	46.2 %
4	Program Requirements	28	37+ 44 CH Clinical Training	-	-	38.9 %
Field Training included in Department & Program Courses (Community Pharmacy & Clinical Clerkship)		13	46	-	-	22.1 %
Total Program Cr. Hrs.		78	208	-	-	100%

13. Study Plan for the Bachelor of Pharm. D. Program: 208 CH)

A. University Requirements (15 Credit hours)							
No.	Course Code	Course Name	Theoretical	Seminar	Practical	Training	CH
1	06.11.205	Islamic Culture	2				2
2	06.11.203	English Language	4				4
3	06.11.201	Arabic language	4				4
4	05.03.221	Computer Skills	2		2		3
5	06.11.208	Medical Physics	2				2
	Total		14		2		15
Total of Credit Hours			15				

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B. Faculty Requirements (16 Credit hours)							
No.	Course Code	Course Name	Theoretical	Seminar	Practical	Training	Total
1	03.01.210	General Microbiology	2		2		3
2	04.01.217	Fundamentals of Nursing	2		2		3
3	05.01.220	Communication skills	2				2
4	04.01.218	Medical terminology	2				2
5	05.02.222	Medical Statistics	2				2
6	05.02.224	Medical ethics	2				2
7	05.02.223	Research Methodology	2				2
	Total		14		4		16
Total of Credit Hours			**16**				

C. Requirements for Faculty Departments (94 Credit hours)							
No.	Course Code	Course Name	Theoretical	Seminar	Practical	Training	Total
1.	01.01.202	Histology	2		2		3
2.	02.04.243	General Chemistry	2				2
3.	01.01.201	Anatomy	2		2		3
4.	03,01,315	Molecular Biology	2				2
5.	03.01.208	Fundamentals of Nutrition	2				2
6.	01.01.203	Physiology-I	2				2
7.	02.02.227	Physical Pharmacy	2		2		3
8.	03.02.211	Fundamental of Immunology	2				2
9.	01.01.205	General Pathology	2		2		3
10.	03.04.212	Parasitology	2		2		3
11.	01.01.206	Physiology-II	2				2
12.	02.03.236	Pharmacology-I	2				2
13.	02.04.244	Pharmaceutical Organic Chemistry-I	2		2		3
14.	03.01.312	Biochemistry-I	2		2		3
15.	02.04.246	Pharmaceutical Analytical Chemistry-I	2		2		3
16.	02.04.247	Pharmaceutical Analytical Chemistry-II	2		2		3
17.	02.04.249	Pharmacognosy-I	2		2		3
18.	02.02.229	Pharmaceutics-I	2		2		3
19.	02.04.245	Pharmaceutical Organic Chemistry-II	2		2		3
20.	03.01.313	Biochemistry-II	2		2		3

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

21.	03.01.316	Biochemistry-III	2		2		3
22.	02.04.251	Pharmaceutical Instrumental Analysis	2				2
23.	02.02.230	Biopharmaceutics	2				2
24.	02.04.264	Phytochemistry	2				2
25.	02.04.248	Medicinal Chemistry-I	2		2		3
26.	02.02.231	Pharmaceutics-II	2		2		3
27.	02.03.237	Pharmacology-II	2				2
28.	02.03.238	Pharmacology-III	2				2
29.	02.02.234	Pharmaceutics-III	2		2		3
30.	02.04.250	Medicinal Chemistry-II	2		2		3
31.	02.01.213	Hospital Pharmacy	2				2
32.	02.01.216	Community Pharmacy	2			2	4
33.	02.03.239	Pharmacology-IV	2				2
34.	02.03.240	Pharmacology-V	2				2
35.	02.02.233	Pharmacoepidemiology and Pharmacoeconomics	2				2
36.	02.02.235	Pharmaceutical promotion and marketing	2				2
37.	02.01.214	Basic Pharmacokinetics	2				2
38.	02.03.242	Toxicology	2				2
Total			76		36	2	96
Total of Credit Hours			**96**				

D. Pharm. D. Program Requirements (47 Credit hours)

No.	Course Code	Course Name	Theoretical	Seminar	Practical	Training	Total
1.	02.02.232	Drug Information Resources	2				2
2.	03.01.215	Clinical Biochemistry	2				2
3.	02.01.211	Clinical Nutrition	2				2
4.	02.01.212	Therapeutics (1)	2		2		3
5.	02.01.215	Therapeutics (2)	2		2		3
6.	02.01.218	Therapeutics (3)	2		2		3
7.	02.01.217	Pharmaceutical Care	2				2
8.	02.01.221	Clerkship-I				252 hrs	5
9.	02.03.241	Pharmaceutical Biotechnology	2				2
10.	02.01.223	Clinical Pharmacokinetics	2		2		3
11.	03.02.216	Clinical. Immunology	2				2
12.	03.02.215	Clinical. Microbiology	2				2
13.	02.01.219	Pharmacy Practice (1)	2				2
14.	02.01.224	Pharmacy Practice (2)	2				2

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

15.	02.01.220	Therapeutics (4)	2		2		**3**
16.	02.01.222	Therapeutics (5)	2				**2**
17.	02.01.225	Clerkship-II				252 hrs	**5**
18.	02.01.226	Research Project	1		2		**2**
	Total		29		10	10	**47**
Total credit hours			**47**				

E. Pharm. D. Program Training Courses Requirements (34 Credit hours)

No.	Course Code	Course Name	Theoretical	Seminar	Weekly practical contact hrs.	Total practical contact hrs.	Practical (Credit hrs.)
1.	02.05.252	**Hospital Training,** Internal Medicine-I	-	6	30	210	**7**
2.	02.05.253	**Hospital Training,** Ambulatory care	-	6	30	90	**3**
3.	02.05.254	**Hospital Training,** Pediatric	-	6	30	90	**3**
4.	02.05.255	**Hospital Training,** Hospital Pharmacy	-	-	36	72	**2**
5.	02.05.256	**Hospital Training,** Oncology care	-	6	30	72	**2**
6.	02.05.257	**Hospital Training,** Internal Medicine-II	-	6	30	252	**7**
7.	02.05.258	**Hospital Training,** Intensive Care Unit	-	-	30	72	**2**
8.	02.05.259	**Hospital Training,** Surgery	-	6	30	90	**3**
9.	02.05.260	**Hospital Training,** Gynecology & Obstetrics	-	6	30	90	**3**
10.	02.05.261	**Hospital Training,** Psychiatric	-	-	30	72	**2**
Total credit hours			**34**				

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

F. Distribution of Courses according to Semesters

#	Course Code	Level 1 / Semester 1	Credit hours				Total Credit Hours
		Course Name	Theoretical	Seminar	Practical	Training	
1	06.11.205	Islamic Culture	2				2
2	06.11.203	English Language	4				4
3	06.11.201	Arabic language	4				4
4	06.11.208	Medical Physics	2				2
5	02.04.243	General Chemistry	2				2
6	04.01.218	Medical Terminology	2				2
7	04.01.217	Fundamentals of Nursing	2		2		3
8	05.02.224	Medical Ethics	2				2
Total			20		2		21
Total of Credit Hours			**21**				

#	Course Code	Level 1 / Semester 2	Credit Hours				Total
		Course Name	Theoretical	Seminar	Practical	Training	
1	03.01.207	Biochemistry-I	2		2		3
2	01.01.202	Histology	2		2		3
3	03.01.208	Fundamentals of Nutrition	2				2
4	05.03.221	Computer Skills	2		2		3
5	01.01.201	Anatomy	2		2		3
6	05.01.220	Communication skills	2				2
7	01.01.203	Physiology-I	2				2
Total			14		8		18
Total of Credit Hours			**18**				

#	Course Code	Level 2 / Semester 1	Credit Hours				Total
		Course Name	Theoretical	Seminar	Practical	Training	
1.	03.02.210	General Microbiology	2		2		3
2.	03.01.213	Biochemistry-II	2		2		3
3.	03,01,315	Molecular Biology	2				2
4.	03.02.211	Fundamental of Immunology	2				2
5.	01.01.205	General Pathology	2		2		3
6.	03.04.212	Parasitology	2		2		3
7.	1.01.206	Physiology II	2				2
Total			14		8		18
Total of Credit Hours			**18**				

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

#	Course Code	Level 2 / Semester 2	Credit Hours				Total
		Course Name	Theoretical	Seminar	Practical	Training	
1.	02.03.236	Pharmacology-I	2				2
2.	03.01.216	Biochemistry-III	2		2		3
3.	02.04.244	Pharmaceutical Organic Chemistry-I	2		2		3
4.	05.02.222	Medical statistics	2				2
5.	02.04.246	Pharmaceutical Analytical Chemistry	2		2		3
6.	02.02.227	Physical Pharmacy	2		2		3
Total			12		8		16
Total of Credit Hours			**16**				

#	Course Code	Level 3 / Semester 1	Credit Hours				Total
		Course Name	Theoretical	Seminar	Practical	Training	
1.	02.04.247	Pharmaceutical analytical chemistry (2)	2		2		3
2.	02.02.229	Pharmaceutics-I	2		2		3
3.	02.04.249	Pharmacognosy	2		2		3
4.	02.04.245	Pharmaceutical Organic Chemistry-II	2		2		3
5.	02.03.237	Pharmacology-II	2				2
6.	02.01.211	Clinical Nutrition	2				2
Total			12		8		16
Total of Credit Hours			**16**				

#	Course Code	Level 3 / Semester 2	Credit Hours				Total
		Course Name	Theoretical	Seminar	Practical	Training	
1.	02.04.264	Phytochemistry	2				2
2.	02.03.238	Pharmacology-III	2				2
3.	02.04.248	Medicinal Chemistry-I	2		2		3
4.	02.02.231	Pharmaceutics-II	2		2		3
5.	02.04.251	Pharmaceutical Instrumental Analysis	2				2
6.	02.02.230	Biopharmaceutics	2				2
Total			12		4		14
Total of Credit Hours			**14**				

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

#	Course Code	Level 4 / Semester 1 Course Name	Credit Hours				Total
			Theoretical	Seminar	Practical	Training Contact hrs.	
1	02.01.212	Therapeutics (1)	2		2		3
2	02.01.213	Hospital Pharmacy	2				2
3	02.02.234	Pharmaceutics-III	2		2		3
4	02.01.216	Community Pharmacy*	2			360 hrs.	4
5	02.04.250	Medicinal Chemistry II	2		2		3
6	02.03.239	Pharmacology-IV	2				2
Total			12		6	2	17
Total of Credit Hours			**17**				

***360 contact hours training in a community pharmacy setting**

#	Course Code	Level 4 / Semester 2 Course Name	Credit Hours				Total
			Theoretical	Seminar	Practical	Training	
1.	02.01.215	Therapeutics (2)	2		2		3
2.	02.01.217	Pharmaceutical Care	2				2
3.	02.01.214	Basic Pharmacokinetics	2				2
4.	05.02.223	Research Methodology	2				2
5.	02.02.232	Drug Information Resources	2				2
6.	03.01.215	Clinical Biochemistry	2				2
Total			**12**		**2**		**13**
Total of Credit Hours			**13**				

#	Course Code	Level 5 / Semester 1 Course Name	Credit Hours				Total
			Theoretical	Seminar	Practical	Training (Contact hrs.)	
1	02.01.221	Clerkship-I**				252 hrs.	5
2	02.02.233	Pharmacoepidemiology and Pharmacoeconomics	2				2
3	02.01.218	Therapeutics (3)	2		2		3
4	02.03.240	Pharmacology-V	2				2
5	03.02.216	Clinical Immunology	2				2
6	03.02.215	Clinical. Microbiology	2				2
7	02.01.219	Pharmacy Practice (1)	2				2
8	02.02.235	Pharmaceutical promotion and marketing	2				2
Total			14		2	5	20
Total of Credit Hours			**20**				

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

**** General Clinical Training: 252 contact hours**

#	Course Code	Level 5 / Semester 2 Course Name	Credit Hours				Total
			Theoretical	Seminar	Practical	Training Contact hrs.	
1	02.01.223	Clinical Pharmacokinetics	2		2		3
2	02.03.242	Toxicology	2				2
3	02.01.220	Therapeutics (4)	2		2		3
4	02.01.222	Therapeutics (5)	2				2
5	02.01.225	Clerkship (2) **				252 hrs.	5
6	02.01.226	Research Project	2				2
7	02.01.224	Pharmacy Practice (2)	2				2
8	02.03.241	Pharmaceutical Biotechnology	2				2
Total			14		4	5	21
Total of Credit Hours			**21**				

**** General Clinical Training: 252 contact hrs.**

Pharm. D. Program: Hospital Training						
#	Course Code	Level 6 / Semester 1 Course Name	Credit Hours*			Practical (Credit hours)
			Theoretical	Weekly practical hours	Total practical contact hours	
1	02.05.252	**Hospital Training**: Internal Medicine-I		35	245	7
2	02.05.253	**Hospital Training:** Ambulatory care		35	105	3
3	02.05.254	**Hospital Training:** Pediatric		35	105	3
4	02.05.255	**Hospital Training:** Hospital Pharmacy		35	70	2
5	02.05.256	**Hospital Training:** Oncology care		35	70	2
***One credit hour – one week hospital training (from 8.0 AM to 2.0 PM/5 days/ week)**						
Total of Credit Hours			**17**			

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

#	Course Code	Level 6 / Semester 2 Course Name	Credit Hours* Theoretical	Weekly practical hours	Total practical contact hours	Practical (Credit hours)
1	02.05.257	**Hospital Training.** Internal Medicine-II		35	245	**7**
2	02.05.258	**Hospital Training.** Intensive Care Unit		35	70	**2**
3	02.05.259	**Hospital Training.** Surgery		35	105	**3**
4	02.05.260	**Hospital Training.** Gynecology & Obstetrics		35	105	**3**
5	02.05.261	**Hospital Training.** Psychiatric		35	70	**2**
***One credit hour – one week hospital training (from 8.0 AM to 2.0 PM/5 days/ week)**						
Total of Credit Hours			**17**			

G. Distribution of Total Credit Hours (208 CH)

Level	Term	University Requirements		Faculty Requirements		Department Requirements		Program Requirements		Program Electives		Training		Total CH		Total CH/ Level
		No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	
First	First	4	12	3	7	1	2	-	-	-	-	-	-	8	21	39
	Second	1	3	1	2	5	13	-	-	-	-	-	-	7	18	
Second	First	-	-	1	3	6	15	-	-	-	-	-	-	7	18	34
	Second	-	-	1	2	5	14	-	-	-	-	-	-	6	16	
Third	First	-	-	-	-	5	14	1	2	-	-	-	-	6	16	30
	Second	-	-	-	-	6	14			-	-	-	-	6	14	
Fourth	First	-	-	-	-	5	14	1	3	-	-	-	-	6	17	30
	Second	-	-	1	2	1	2	4	9	-	-	-	-	6	13	
Fifth	First	-	-	-	-	3	6	5	14	-	-	-	-	8	20	39
	Second	-	-	-	-	1	2	7	19	-	-	-	-	8	19	
Sixth	First	-	-	-	-	-	-	-	-	-	-	5	17	5	17	34
	Second	-	-	-	-	-	-	-	-	-	-	5	17	5	17	
Total		5	15	7	16	38	96	18	47	-	-	10	34	78	208	208
Percentage		**7.2%**		**7.7%**		**46.2%**		**22.6%**		-		**16.3%**		**100%**		

*: Graduation Research Project

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

14. Teaching and Learning Strategies:

A. Teaching Tools:

- Active Lectures (supported with discussion),
- Group learning and Problem-based learning,
- Seminars, journal clubs and workshops,
- Practical classes,
- Field training,
- Simulated software program.
- Field visits to industries,
- Computer and web-based learning,
- Use of communication and information technology,
- Project work,
- Directed self-study.

B. Assessment Tools:

- Short essays,
- Written assessments, such as multiple-choice questions (MCQs),
- Faculty assessment by structured observation through checklists and rating scales,
- Seminar assessment,
- Multi-source assessments, such as student self-assessment,
- Simulations, such as computer-based clinical scenarios,
- summative practical assessments,
- Graduate project.
- laboratory and other written reports,
- Work samples, such as, logbooks and portfolios.

A. Teaching Strategies:

It includes description of teaching strategies to achieve learning out comes of the program (lecture, seminar, laboratory, groups, ect. with description of how to use them and average of each of in every course

Teaching Strategy	Description of how it will be used
Lectures	It is the most frequently employed teaching method to convey knowledge and explain theories to students in large groups (50-100) or in sessions, which consist of more than one group gathered in one classroom.
Seminars	These are mainly used with small groups of students in which they find better chances for discussing and negotiating the different concerns of their studies.
Lab experiments	Students doing practices in medical labs individually or in small groups.
Training	This is a practical kind of course where the students are required to plan and execute some field visits to hospitals, corporations, or institutions where the process of clinical pharmacy is essential.
Discussion	This is done by allowing the students to ask questions during the lecture and respond to them by the lecturer or other students for the purpose of establishing and clarify the subject of the lecture strongly and increase the concentration and absorption of the student and the attention and not to enter the boredom.
Presentations	Helps the students to be more confident with themselves and make them to show the others what knowledge they have acquired. It can be followed in many types of courses and tasks.
Self-learning	Self-learning is the process by which learners teach themselves using any materials or resources to achieve clear goals without the direct help of the teacher.
Case study	Case studies are defined as the scientific documentation of a single clinical observation which is so important study design in advancing medical scientific knowledge especially of rare disease.
Office Hours	Office hours are hours determined by the faculty member (professor of the course) to which the student studies. The hours allocated by the professor to meet with his students to help them and answer their queries in the event of any questions they may not be enough time for the lecture to answer it.
Case Studies	The case study is defined as an in-depth descriptive presentation of a particular position or model for the purposes of educational research or for training and education purposes.

B. Assessment Strategies.	
Assessment Strategy	Its description (in which course it will be used and in which rate)
Written examinations	Mid-term test is conducted between 6th to 8th Class and final exam is conducted at the end of each course.
Oral exams	For selected courses
Technical or practical reports /Presentations	As indicated in the course specification
Assignments including problem-solving exercises	The entire assignments including problem-solving exercises of coursework activities during the teaching period of each course. (Which includes group and individual work, tests, and presentations, etc.)
Individual and group project work	As indicated in the course specification
Quizzes	For all courses except for project
Homework	For all courses except for project

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

C. Project Assessment: Each project will be assessed by a committee of three members as follows:

Items	Marks Distribution
Project supervisor	70 %
Internal examiner: a member of the department teaching staff.	15 %
External examiner: a qualified external examiner (either from other departments of the college or from another university)	15%
Total	100%

15. Alignment of Program Intended Learning Outcomes (PILOs) to Teaching Strategies and Assessment Methods:

(A) Alignment of Program Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:

PILOs	Teaching Strategies	Assessment Methods
A1. Recognize the fundamental knowledge from scientific knowledge and principles of chemical, biomedical, microbiological, physiological, pathological, behavioral, and other basic & clinical sciences related to the pharmacy profession.	o Lectures. o Exercises in lectures and seminars o Presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Quizzes o Homework
A2. Demonstrate the essential knowledge about physicochemical and pharmacokinetic properties of medicines and their influence on compounding, evaluation, analysis, route of administration, and dosage regimen.	o Lectures. o Exercises in lectures and seminars o presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Quizzes o Home work
A3. Recognize broad knowledge about the mechanism of action, effectiveness, use, safety, side effects, and interactions of natural and synthetic medicines.	o Lectures. o Exercises in lectures and seminars o presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Quizzes o Home work
A4. Define the pharmacist's roles in medication therapy management services including non-prescription medications, natural health products,	o Lectures. o Exercises in lectures	o Written examinations o Technical or practical

and devices.	and seminars o presentations and discussions in class	reports /Presentations o Quizzes o Home work
A5. Recognize the advanced concepts of professional (ethics, policies, laws, regulations requirements, management pharmacovigilance, pharmacoepidemiology, pharmacoeconomic, pharmacoinformatic, ...etc) to optimize the therapeutic outcomes.	o Lectures. o Exercises in lectures and seminars o presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Quizzes o Home work
A6. Recognize the requirements of research and sources of information related to medicines and pharmaceutical care.	o Lectures. o Exercises in lectures and seminars o presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Quizzes o Home work
A7. Recognize the role of pharmacists in patient care; dispensing, designing, implementing, monitoring, evaluating, and adjustment of medication therapy plans that are patient-specific and evidence-based to achieve maximum clinical effectiveness.	o Lectures. o Exercises in lectures and seminars o presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Quizzes o Home work

(B) Alignment of Program Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods.

PILOs	Teaching Strategies	Assessment Methods
B1. Integrate the physicochemical properties of medicines to compounding and preparation and analysis of total parenteral nutrition I.V admixtures and small-batch preparation.	o Tutorials o Exercises in lectures and seminars o Group work and problem-solving learning. o presentations and discussions in class o Brainstorming	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work o Home work
B2. Predict the drug properties, including absorption, distribution, metabolism,	o Tutorials	o Written examinations

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

excretion, and interaction with targets in the body, from molecular structure.	o Exercises in lectures and seminars o Group work and problem-solving learning. o Presentations and discussions in class	o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work o Home work
B3. Merge the pharmacological knowledge about natural and synthetic medicines with policies, information systems, workforces, service delivery, pharmacovigilance, Pharmacoepidemiology, and pharmacoeconomic factors to enhance the healthcare systems.	o Tutorials o Exercises in lectures and seminars o Group work and problem-solving learning. o presentations and discussions in class o Brainstorming	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work o Home work
B4. Presume research topics in all pharmaceutical fields to improve drugs utilization, health outcomes, and wellness.	o Tutorials o Exercises in lectures and seminars o Group work and problem-solving learning. o presentations and discussions in class o Brainstorming	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work o Home work

B5. Compare various therapeutic options based on evidence medicine of efficacy, safety, and cost for each drug-related problem.	o Tutorials o Exercises in lectures and seminars o Group work and problem-solving learning. o presentations and discussions in class o Brainstorming	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work o Home work
B6. Formulate an appropriate pharmacotherapy care plan and monitoring strategies for preventing and solving encountered drug-related problems through utilization of pharmacodynamic, pharmacokinetic properties of medicines as well as diseases pathophysiology and patient clinical data.	o Tutorials o Exercises in lectures and seminars o Group work and problem-solving learning. o Presentations and discussions in class o Brainstorming	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises. o Individual and group project work o Quizzes o Individual and group project work o Home work

(C) Alignment of Program Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods.

PILOs	Teaching Strategies	Assessment Methods
C1. Deal safely and effectively with synthetic/natural pharmaceutical materials/products used in pharmaceutical preparations.	o Guided individual reading. o Group work and problem-solving learning. o Tutorials/ seminars. o Presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work
C2. Compound/prepare	o Guided individual reading.	o Written examinations

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

extemporaneous, cytotoxic, I.V admixture, total parenteral nutrition, and small-batch pharmaceutical preparation taking into account the physicochemical properties of drug structures.	o Group work and problem-solving learning. o Tutorials/ seminars. o Presentations and discussions in class	o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work
C3. Contribute to strategies of medication management including monitoring and improving medicines use.	o Guided individual reading. o Group work and problem-solving learning. o Tutorials/ seminars. o presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work
C4. Utilize scientific literature, results of pharmaceutical research, and information interpretation to enhance professional decisions.	o Guided individual reading. o Group work and problem-solving learning. o Tutorials/ seminars. o presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work
C5. Implement patient-oriented pharmaceutical care legally and ethically in a variety of patient care settings in collaboration with patients and other health care professionals according to professional standards and appropriate therapeutic guidelines.	o Guided individual reading. o Group work and problem-solving learning. o Tutorials/ seminars. o Presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work
C6. Contribute to pharmaceutical research studies and clinical trials needed to optimize medicine use in specific medical conditions		

(D) Alignment of Program Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods.

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

PILOs	Teaching Strategies	Assessment Methods
D1. Develop leadership, time management, critical thinking, problem-solving, communication, independence, creativity, innovation, entrepreneurial, delegation, and organizational skills	o Guided individual reading. o Group work and problem-solving learning. o Tutorials/ seminars. o Presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work
D2. Demonstrate skills in documenting and recording relevant information, findings, decisions, recommendations, and other information accurately and concisely, taking due account of privacy and confidentiality.	o Guided individual reading. o Group work and problem-solving learning. o Tutorials/ seminars. o Presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work
D3. Develop life-long learning, in particular an awareness of the need for continuing education, research, scholarship, and professionalism in the field of pharmaceutical practice.	o Guided individual reading. o Group work and problem-solving learning. o Tutorials/ seminars. o presentations and discussions in class	o Written examinations o Technical or practical reports /Presentations o Assignments including problem-solving exercises o Individual and group project work o Quizzes o Individual and group project work

16. Admission Requirements:

1. Admissions to the program shall be made as per the University admission guidelines and admission rules set by the Ministry of Higher Education and Scientific Research
2. General Secondary school certificate (Science Section) or any equivalent certificate with grade as specified in the admission rules made by Ministry of Higher Education and Scientific Research.
3. Pass the admission test and personal interview.
4. Any necessary requirement for specialization, decided by the Scientific Section.

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Rector

17.Attendance requirements and graduation
1. Student attendance should not be less than 75% in each course.
2. Student will graduate after successfully passing all program requirements.
3. Total credit hours for the program are 208 credit hours.
4. Minimum score for any student to pass any credit hours course is 50 % degree.

18.Grading System	
From 90% to 100% from total marks	Excellent
From 80% to less than 90%	Very Good
From 65% to less than 80%	Good
From 50% to less than 65%	Pass
Less than 50%	Poor/Fail

19.Facilities required for running the program
Sources of learning:
1. Lecture rooms with facilities
2. Labs with facilities
3. Training in different hospital departments
4. Library study room and electronic library (books as write in each course specification)
5. Internet and professional information access

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Rector

20. Annex-5, Survey of PILOs for Similar Accredited Programs at National and International Universities

Program PILOs	Similar Accredited Programs					Accreditation Bodies	
	University of Science and Technology, Yemen	Jordan University of Science & Technology (JUST), Jordan	Al King Faisal University, KSA	Gulf Medical University, UAE	The University of Iowa, USA	Egypt, NAQAAE (2018). National Academic Reference Standards, Pharmacy, First Edition	ACPE, USA, 2015
A. Knowledge and Understanding: **A1.** Recognize the fundamental knowledge from	**C. Program Intended Learning Outcomes** **A. Knowledge and Understanding**	**Domain 1: Foundational knowledge:** 1.1 Learner: Develop, integrate, and apply knowledge from the foundational	**1. Knowledge** 1.1 Describe essential biomedical, pharmaceuti	**PLO 1 .1.1 Learner (learner)** Develop, integrate, and apply knowledge from the foundational sciences to evaluate the	**Knowledge** 1.1 Expert knowledge of medications: Student pharmacists will demonstrate knowledge of and ability to integrate and	**A-KNOWLEDGE AND UNDERSTANDING** A1. Show understanding of the fundamentals of the basic and biomedical sciences including physics, mathematics, chemistry, structure	**Standard 1: Foundational Knowledge** The professional program leading to the Doctor of Pharmacy degree (hereinafter "the program") develops in the graduate the

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Rector

scientific knowledge and principles of chemical, biomedical, microbiological, physiological, pathological, behavioral, and other basic & clinical sciences related to the pharmacy profession. **A2.** Demonstrate essential knowledge about	**Program Outcomes Biomedical Sciences:** **A1.** Define the fundamentals of the biomedical sciences including structure of the body, normal and abnormal body function, basis of genomes and different	sciences to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and patient centered care. **Domain 2: Essentials for Practice and Care:** 2.1 Caregiver (Patient-centered-care): Provide patient-centered care as the medication expert	cal, social, behavioral, administrative and clinical sciences knowledge related to the development and use of medications, natural remedies, and other therapies for prevention and treatment of diseases.	scientific literature, explain drug action and interactions, solve therapeutic problems, and advance population health and patient-centered care. **PLO 2 .2.1 Patient-centered care (Care provider)** Provide patient-centered care as the pharmacotherapy expert to diverse patients using the best	apply basic principles of chemistry, biochemistry, physical science, biology, mathematics and statistics needed for the application of these sciences to drug therapy and human health. 1.2 Expert knowledge of practice: Student pharmacists will demonstrate knowledge of and ability to use principles of	of human body, normal and abnormal body functions, basis of genomes and different biochemical pathways and their relations to different diseases. A2. Explain the fundamentals of social and behavioral sciences relevant to pharmacy, ethics of health care and its impact on their relationship with patients and other healthcare professionals. A3. Explain the physicochemical properties of pharmaceutical products and their relationship to molecular structure	knowledge, skills, abilities, behaviors, and attitudes necessary to apply the foundational sciences to the provision of patient-centered care. Key Element: 1.1. Foundational knowledge – The graduate is able to develop, integrate, and apply knowledge from the foundational sciences (i.e., biomedical, pharmaceutical, social/behavioral/administrative, and clinical sciences) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and patient-

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the physicochemical and pharmacokinetic properties of medicines and their influence on compounding, evaluation, analysis, route of administration, and dosage regimen . **A3.** Recognize broad knowledge about the mechanism of	biochemical pathways and their relations with different diseases. **Pharmaceutical Sciences:** **A2.** List the sources, purification methods, physico-chemical properties, molecular structure and	(collect and interpret evidence, prioritize, formulate assessments and recommendations, implement, monitor and adjust plans, and document activities . 2.2 Manager (Medication use systems management) : Manage patient healthcare needs using human, financial, technological, and physical resources to	(almost all Pharmaceutical and Biomedical Courses) 1.2 Describe the concepts and principles of various pharmacy practice settings . 1.3 Recognize the role of pharmacists	available evidence and resources, taking into consideration patients', their families, and their caregivers circumstances and beliefs. **PLO 3 .2.2 Medication use systems management (Manager)** Manage patient healthcare needs using human, financial, technological, and physical resources to optimize the safety and	therapeutics, quality improvement, communication, economics, health behavior, social and administrative sciences, health policy and legal issues in the practice of pharmacy . **Personal Skills** 2.1 Problem-solving and decision-making: Student pharmacists will demonstrate use of	and the design of medicinal agents. A4. Describe the analytical methods, principles, design, development, and validation of pharmaceutical products. A5. Identify the actions of the medicines within living systems, therapeutic uses of medicines in human, adverse reactions, interactions of medicines, toxicity, and misuse or abuse. A6. Explain the basis of complementary and alternative medicine. A7. Identify the types of poisonous substances, sources,	centered care **Standard 2: Essentials for Practice and Care** The program imparts to the graduate the knowledge, skills, abilities, behaviors, and attitudes necessary to provide patient-centered care, manage medication use systems, promote health and wellness, and describe the influence of population-based care on patient-centered care. Key Elements: 2.1. Patient-centered care – The graduate is able to provide patient-centered care as the medication expert (collect and interpret evidence, prioritize,

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Rector

action, effectiveness, use, safety, side effects, and interactions of natural and synthetic medicines. **A4.** Define the pharmacist's roles in medication therapy management services including non-prescription medications,	design of substances used in medicine **A3.** Recall the properties of formulations additives, principles of medicines formulation and manufacturing techniques, and pharmaceutical analytical methods. **A4.** Identify the	optimize the safety and efficacy of medication use systems. 2.3 Promoter (Health and wellness): Design prevention, intervention, and educational strategies for individuals and communities to manage chronic disease and improve health and wellness. 2.4 Provider (Population-based care): Describe how	according to legal, ethical, and professional standards in promoting health, and the prevention and treatment of diseases. **2 .Skills** 2.1 Integrate pharmaceutical sciences with pharmacy	efficacy of medication use systems. **PLO 4 .2.3 Health and wellness promotion (Promoter)** Develop prevention, screening, intervention, and educational strategies for individuals and communities to maintain and improve health and wellness and to manage chronic diseases. **PLO 5 .3.1 Ethical decision making and**	observational , analytical and critical thinking skills to develop, implement and evaluate solutions that solve real-world problems. 2.2 Communication: Student pharmacists will effectively listen, speak and write in a manner that facilitates positive interaction with patients, health professionals	mechanisms of toxicity, analysis, clinical pictures, and management. A8. Describe the bio-pharmaceutics and pharmacokinetics of medicines and their applications. A9. Define the basis of health policy, pharmacoeconomics, pharmacoepidemiology, marketing, and administration with reference to pharmacy. A10. Describe the pharmacist's role in health care; dispensing, designing, implementing, monitoring, evaluation, and adjustment of medication therapy	formulate assessments and recommendations, implement, monitor and adjust plans, and document activities). 2.2. Medication use systems management – The graduate is able to manage patient healthcare needs using human, financial, technological, and physical resources to optimize the safety and efficacy of medication use systems. 2.3. Health and wellness – The graduate is able to design prevention, intervention, and educational strategies for individuals and communities to manage chronic disease and improve health and wellness.

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Rector

natural health products, and devices. **A5.** Recognize the advanced concepts of professionalism (ethics, policies, laws, regulations requirements, management pharmacovigilance, pharmacoepidemiology, pharmacoeconomic,	actions of medicines within living systems; pharmacokinetics and pharmacodynamics of drugs, therapeutic uses of medicines in humans, adverse reactions, interactions of medicines, and their	population-based care influences patient-centered care and influences the development of practice guidelines and evidence-based best practices. **Domain 3: Approach to Practice and Care** 3.1 Problem Solver: Identify problems; explore and prioritize potential strategies; and design, implement,	applications (in practice, administration and research). 2.2 Engage in inter-professional healthcare education activities. 2.3 Evaluate scientific and professional literature critically to be utilized in	**problem solving (Problem Solver)** Identify problems; explore and prioritize potential strategies and design, implement, and evaluate a viable solution. **PLO 6 .3.2 Educator (Educator)** Educate healthcare providers, patients, and general population by determining most effective and enduring	and the public. 2.3 Teamwork: Student pharmacists will demonstrate appropriate and effective team behaviors in achieving shared goals in a variety of situations such as interprofessional teams and other pharmacy-related work environments . **Professional Skills** 3.1 Patient-	plans that are patient-specific and evidence-based to achieve maximum clinical effectiveness. A11. Identify the properties of different pharmaceutical dosage forms including novel drug delivery systems and biotechnology. A12. Describe the methods of bio-statistical analysis and pharmaceutical calculations. **B-COGNITIVE/INTELLECTUAL SKILLS:** B1. Collect, interpret and asses relevant pharmaceutical and biomedical sciences to construct the	2.4. Population-based care – The graduate is able to describe how population-based care influences patient-centered care and the development of practice guidelines and evidence-based best practices. **Standard 3: Approach to Practice and Care** The program imparts to the graduate the knowledge, skills, abilities, behaviors, and attitudes necessary to solve problems; educate, advocate, and collaborate, working with a broad range of people; recognize social determinants of health; and effectively communicate verbally

pharmacoinformatic, ...etc) to optimize therapeutic outcomes. **A6.** Recognize the requirements of research and sources of information related to medicines and pharmaceutical care. **A7.** Recognize the role of pharmacists in	significance in treatment. **A5.** Relate the etiology, epidemiology, laboratory diagnosis and clinical features of different diseases and their pharmacotherapeutic approaches. The behavioral, social, and administrative	and evaluate a viable solution. 3.2 Educator: Educate all audiences by determining the most effective and enduring ways to impart information and assess understanding. 3.3 Advocate (Patient Advocacy): Assure that patients' best interests are represented. 3.4 Collaborator (Interprofessi	evidence-based practice, conducting research and problem-solving. 2.4 Apply basic drug development skills in relevant settings. **3 . Competencies** 3.1. Autonomy	way to impart knowledge and assess understanding. **PLO 7 .3.3 Patient Advocacy (Advocate)** Assure that patients' best interests are represented and consider patient experience. **PLO 8 .3.4 Inter & intra professional collaboration (Collaborator)** Actively participate and engage as a	centered care: Student pharmacists will provide patient-centered care to diverse patients using the best available evidence and in consideration of patients' circumstances to devise, modify, implement, document and monitor pharmacotherapy care plans, either independently or as part of healthcare teams.	pharmacophores of the structure and their effect on the stability, pharmacokinetic and pharmacodynamics profile of the drug. B2. Classify the synthetic and natural drugs according to their mechanism of action, systemic effect, therapeutic uses, contraindication and toxicity. B3. Design and evaluate different types of safe and effective pharmaceutical dosage forms. B4. Select appropriate Standard Operating Procedures (SOP) to conduct qualitative	and nonverbally. Key Elements: 3.1. Problem solving – The graduate is able to identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution. 3.2. Education – The graduate is able to educate all audiences by determining the most effective and enduring ways to impart information and assess learning. 3.3. Patient advocacy – The graduate is able to represent the patient's best interests. 3.4. Interprofessional collaboration – The graduate is able to

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patient care; dispensing, designing, implementing, monitoring, evaluating, and adjustment of medication therapy plans that are patient-specific and evidence-based to achieve maximum clinical effectiveness. **B. Cognitive/ Intellectual Skills:**	pharmacy sciences **A6.** Review the fundamentals of social and behavioral sciences relevant to pharmacy, ethics of health care, health care systems, health policy and economics, pharmacy law, and causes and	onal collaboration) : Actively participate and engage as a healthcare team member by demonstrating mutual respect, understanding, and values to meet patient care needs. 3.5 Includer (Cultural sensitivity): Recognize social determinants of health to diminish disparities and inequities in access to	and responsibility 3.1.1 . Demonstrate leadership skills, accountability, and acceptance of responsibility within a team in various settings. 3.1.2 . Advocate patient rights	healthcare team member by demonstrating mutual respect, understanding, and values to meet patient care needs. **PLO 9 .3.5 Cultural Sensitivity (Includer)** Recognize the social determinants of health and traditional compassion to avoid bias and inequities in access to quality care. **PLO 10 .3.6 Communicat**	3.2 Population and public health: Student pharmacists will design, implement and assess initiatives to improve health and wellness . 3.3 Medication use systems management : Student pharmacists will effectively apply principles of finance, marketing and human resources to	and quantitative analysis of pharmaceutical preparations. B5. Plan a modern system for administration of medical foundations and merge the ethics to business in the drug marketing B6. Develop and design suitable methods for extraction, isolation, purification, identification, and standardization of active substances from various sources. B7. Formulate and evaluate patient care plan about the rational use of medications to improve patient safety and efficacy.	actively participate and engage as a healthcare team member by demonstrating mutual respect, understanding, and values to meet patient care needs. 3.5. Cultural sensitivity – The graduate is able to recognize social determinants of health to diminish disparities and inequities in access to quality care. 3.6. Communication – The graduate is able to effectively communicate verbally and nonverbally when interacting with individuals, groups, and organizations. **Standard 4: Personal and Professional Development**

B1. Integrate the physicochemical properties of medicines to compounding and preparation and analysis of total parenteral nutrition I.V admixtures and small-batch preparation. **B2.** Predict the drug properties, including absorption, distribution,	prevention of medical errors. **Clinical Sciences and Practice Skills** **A7.** Illustrate the pharmacist's role in health care; managing medicines: responding to symptoms, non-prescription drug use, compounding,	quality care. 3.6 Communicator: Effectively communicate verbally and nonverbally when interacting with an individual, group, or organization. **Domain 4: Personal and Professional Development** 4.1 Self-aware: Examine and reflect on personal knowledge, skills, abilities, beliefs, biases,	to safe and effective medication use in various settings. 3.1.3 . Practice reflective and independent thinking to effectively manage and respond to routine or unanticipated	**ion (Communicator)** Effectively communicate orally and in written by identifying verbal and nonverbal ques when interacting with patients and healthcare providers. **PLO 11 .3.7 professional statistics & calculation (Calculator)** Perform precise calculations in pharmacy practice and interpretation of statistical	manage medication use systems. 3.4 Educator: Student pharmacists will educate all audiences by determining the most effective and enduring ways to impart information and assess understanding . 3.5 Information management: Student pharmacists will utilize information management	B8. Use appropriate research methods to solve practice problems. B9. Apply pharmaceutical calculation in different pharmaceutical practice. C- **PRACTICAL AND PROFESSIONAL SKILLS:** C1. Handle the chemical, biological, and pharmaceutical materials safely, taking into account their physical and chemical properties, including any specific hazards associated with their use, distribution, and storage. C2. Operate different pharmaceutical	The program imparts to the graduate the knowledge, skills, abilities, behaviors, and attitudes necessary to demonstrate self-awareness, leadership, innovation and entrepreneurship, and professionalism. Key Elements: 4.1. Self-awareness – The graduate is able to examine and reflect on personal knowledge, skills, abilities, beliefs, biases, motivation, and emotions that could enhance or limit personal and professional growth. 4.2. Leadership – The graduate is able to demonstrate

metabolism, excretion, and interaction with targets in the body, from molecular structure. **B3.** Merge the pharmacological knowledge about natural and synthetic medicines with policies, information systems, workforces,	dispensing, provision of medicine and patient information, documentation, reporting of adverse reactions of medicines, drug information, and drug abuse. **B. Intellectual Skills** **B1.** Integrate the relevant	motivation, and emotions that could enhance or limit personal and professional growth. 4.2 Leader: Demonstrate responsibility for creating and achieving shared goals, regardless of position. 4.3 Innovator (Innovation and Entrepreneurship): Engage in innovative activities by using creative thinking to envision better ways	circumstances. 3.2. Practice 3.2.1 . Utilize appropriate information technologies to optimize medication use and patient care. 3.2.2 . Contribute to decision-making	data processing and evaluation. **PLO 12 .4.1 Self-Awareness (Self-Aware)** Examine and reflect on personal knowledge, skills, abilities, beliefs, biases, motivation, and emotions that could enhance or limit personal and professional growth. **PLO 13 .4.2 Leadership &**	systems to access information and provide care. They will also contribute to system development and ongoing improvement . 3.6 Scholarship and research: Student pharmacists will be effective translators of scientific concepts and technologies by being critical appraisers of the scientific literature.	equipment and instruments and use emerging technologies in pre-formulation, formulation, packaging, storage and analysis of pharmaceutical products according to Good Laboratory Practice (GLP), Good Storage Practice (GSP) and cGMP guidelines. C3. Screen drug from different sources, bioassay, and carry out pharmacological and biopharmaceutical experiments. C4. Extract, isolate, purify, identify, standardize, formulate natural products and assure their rational use.	responsibility for creating and achieving shared goals, regardless of position. 4.3. Innovation and entrepreneurship – The graduate is able to engage in innovative activities by using creative thinking to envision better ways of accomplishing professional **goals.** 4.4. Professionalism – The graduate is able to exhibit behaviors and values that are consistent with the trust given to the profession by patients, other healthcare providers, and society.

Head of Department Quality Unit Dean of the Faculty Center of Development & Quality Assurance

Rector

service delivery, pharmacovigilance, Pharmacoepidemiology, and pharmacoeconomic factors to enhance the healthcare systems. **B4.** Presume research topics in all pharmaceutical fields to improve drug utilization, health outcomes,	knowledge and understanding required to meet the needs of patients and other health care professionals **B2.** Propose medicine doses, dosage regimens related to normal and abnormal clinical situations.	of accomplishing professional goals. 4.4 Professional: Exhibit behaviors and values that are consistent with the trust given by the profession by patients, other healthcare providers, and society. **Domain 5: Pharmaceutical product expert** 5.1 Manufacturer: Carries out compounding procedures to	processes by providing accurate and relevant recommendations in various settings (clinical, administration, drug development). 3.2.3 . Interpret information obtained from	**Management (Leader)** Demonstrate responsibility for creating and achieving shared goals, regardless of position, and able to effectively manage resources, information and participate in organizational planning. **PLO 14 .4.3 Innovation & Entrepreneurship (Innovator)** Engage in innovative and entrepreneurial activities	They will apply the principles of research in their pursuit of professional discovery. 3.7 Innovation and entrepreneurship: Student pharmacists will engage in innovative activities by using creative thinking to envision better ways of accomplishing professional goals.	C5. Advise the patients and health care professionals to optimize medicines use. C6. Employ the relevant ways of preparation and presentation of medicines including extemporaneous, Total Parenteral Nutrition (TPN), and Intravenous (I.V.) admixtures. C7. Apply administrative and pharmacoeconomic rules in pharmacy and ethically use marketing skills for promoting the pharmaceutical and cosmetic products. C8. Conduct research studies and utilize the results in different pharmaceutical	

and wellness. **B5.** Compare various therapeutic options based on evidence medicine of efficacy, safety, and cost for each drug-related problem. **B6.** Formulate an appropriate pharmacotherapy care plan and monitoring	**B3.** Interpret prescription, medication orders, pharmaceutical information, clinical data, including patient records held within practice settings. **B4.** Select the appropriate methods of isolation, synthesis,	produce an effective and safe medicine (Compounder) and implements quality control measures and tests (Quality Manager)	different resources to provide creative solutions for complex problems. 3.2.4 . Communicate clearly and effectively with health care professionals, patients, caregivers, administrative and	by using creative thinking to envision better and productive ways of accomplishing professional goals. **PLO 15 .4.4 Professionalism & Ethical practice (professional)** Exhibit behaviors and values consistent with the trust given to the profession by patients, other healthcare providers,	**Attitudes and Values** 4.1 Professional attitudes and behaviors: Student pharmacists will exhibit professional ethics, attitudes and behaviors by demonstrating patient advocacy, altruism, accountability, compassion, integrity and respect for others. Student pharmacists will show leadership by initiating and	fields. **D – GENERAL / TRANSFERABLE SKILLS:** D1. Interact and communicate effectively and ethically with patients, public, and health care professionals. D2. Apply financial, management, decision-making, time management, organization, sales and marketing skills. D3. Appraise the importance of team work and the need to work within personal limitations. D4. Take responsibility for adaptation to change in pharmacy practice. D5.	

strategies for preventing and solving encountered drug-related problems through the utilization of pharmacodynamic, pharmacokinetic properties of medicines as well as diseases pathophysiology and patient clinical data. **C. Practical and Professional**	purification, identification, standardization, and formulation of active substances from different origins. **C. Professional and Practical Skills** **C1.** Handle the chemical, biological, and pharmaceutical materials safely, taking into account their physical and chemical properties, including proper operation of		supportive personnel and the public in various settings. 3.2.5 . Construct patient-centered evidence-based pharmaceutical care plans. 3.3. Attribute 3.3.1.	and society. **PLO 16 4.5. Research and Scholarship (Scholar)** Engage scholarly activities related to the healthcare and pharmaceutical practice.	advocating change to develop new opportunities in response to problems they identify. 4.2 Social and cultural awareness: Student pharmacists will recognize social determinants of health and respect patients' cultural, social and religious perspectives to produce safe and appropriate medication use throughout	Retrieve the essential references of evidence-based practice to achieve maximum clinical effectiveness.	

Skills: **C1.** Deal safely and effectively with synthetic/natural pharmaceutical materials/products used in pharmaceutical preparations. **C2.** Compound/prepare extemporaneous, cytotoxic, I.V admixture, total parenteral	pharmaceutical instruments. **C2.** Execute the planning, design and carrying out of pharmaceutical research investigations، from the problem-recognition stage through to the evaluation and appraisal of results and findings. **C3.** Employ the relevant way of analysis, preparation, determination of quality, and presentation of medicines,		Embrace the interprofessional approach to healthcare practices. (IPE) 3.3.2 . Display integrity, trustworthiness, confidence, self-awareness and the potential of entrepreneur		society. 4.3 Self-awareness: Student pharmacists, through reflection on their knowledge, experiences, values, attitudes, biases and beliefs, will show evidence of being self-aware, life-long learners. Student pharmacists will maintain and enhance personal and professional growth.		

nutrition, and small-batch pharmaceutical preparation considering the physicochemical properties of drug structures. **C3.** Contribute to strategies of medication management including monitoring and improving medicines use. **C4.** Utilize	by manufacture and extemporaneous dispensing. **C4.** Advise the patient and health care professionals on the safe and effective use of medicines as well as developing and supporting therapeutic plans with continuous monitoring with the capability to refer patients to other health care professionals when required. **C5.** Implement		ship in various settings. 3.3.3. Demonstrate empathy, professional attitude, ethical behavior, social and cultural awareness and proper judgement in various settings.				

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scientific literature, results of pharmaceutical research, and information interpretation to enhance professional decisions . **C5.** Implement patient-oriented pharmaceutical care legally and ethically in a variety of patient care settings in	class room training in hospital setting practice by providing interventions and recommendations about treatment strategies directly to preceptors during clinical training. Intended Learning Outcomes **D. General Skills** **D1.** Interact effectively with patients, the public and health care professionals;						

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collaboration with patients and other health care professionals according to professional standards and appropriate therapeutic guidelines . **C6.** Contribute to pharmaceutical research studies and clinical trials needed to optimize medicine use in specific	including both written and oral communications. **D2.** Retrieve information in relation to primary and secondary information sources, to analyze the published literature. **D3.** Adopt ethical, legal and safety guidelines while maintaining the code of practice. **D4.** Develop financial, teamwork, management, decision-						

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medical conditions. **D. General and Transferable Skills:** D1. Develop leadership, time management, critical thinking, problem-solving, communication, independence, creativity, innovation, entrepreneurial, delegation, and organizational	making, time management، organization, sales and marketing skills						

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Rector

skills D2. Demonstrate skills in documenting and recording relevant information, findings, decisions, recommendations, and other information accurately and concisely, taking due account of privacy and confidentiality. D3. Develop life-long learning, in							

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particular an awareness of the need for continuing education, research, scholarship, and professionalism in the field of pharmaceutical practice.							

21. Appendix:

Annex (1):

Matrix of mapping program of Pharm.D. ILOs with courses.

Annex (2):

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Alignment of Faculty Objectives with Program Intended Learning Outcomes for Pharm.D. Program

Annex (3)

Alignment of Program Intended Learning Outcomes (PILOS) to Program Objectives (POs)

Annex (4):

Themes of Courses of Study and their Weightage

Annex (5):

Survey of PILOs for Similar Accredited Programs at National and International Universities

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