

توصيف برنامج بكالوريوس الصيدلة

(فارم دي - Pharm D)

Clinical Pharmacy

طبقاً لنظام الساعات المعتمدة

كلية الصيدلة - جامعة أسيوط 2020

Program Specification



Dean of Faculty

Prof. Dr Ahmed M. A. Abdelmawla

QAU Director

Prof. Dr Hassan R. H. Ali

A- Basic Information

1. **Program title:** Pharm D (Clinical Pharmacy)

Program Vision:

Scientific excellence and continuous development for pharmacy profession, aiming to reaching a distinguished international position in clinical pharmacy to serve the therapeutic health system.

Program Mission:

Graduate well educated clinical pharmacists, equipped with recent concepts and developments in the field. Create a cooperative relationship among the health team professionals. Improve scientific research in the area of clinical therapeutics.

2. **Program type:** Single
3. **Faculty:** Faculty of Pharmacy, Assuit University.
4. **Departments:**

A. Departments affiliated to Faculty of Pharmacy:

- 1- Department of Pharmaceutics
- 2- Department of Pharmacognosy
- 3- Department of Medicinal Chemistry
- 4- Department of Pharmaceutical Organic Chemistry
- 5- Department of Pharmaceutical Analytical Chemistry
- 6- Department of Industrial Pharmacy
- 7- Department of Clinical Pharmacy
- 8- Department of Biochemistry
- 9- Department of Microbiology and Immunology
- 10- Department of Pharmacology and Toxicology

B. Departments affiliated to Faculty of Medicine:

- 1- Department of Anatomy
- 2- Department of Histology
- 3- Department of Physiology
- 4- Department of Pathology
- 5- Department of Public Health and Community medicine
- 6- Department of Parasitology
- 7- Department of Oncology
- 8- Department of Dermatology
- 9- Department of Pediatric Medicine,
- 10- Department of Gastroenterology and Tropical Medicine,

- 11- Department of Chest Diseases
- 12- Department of Cardiology.
- 13- Department of Neurology and Psychology.

C. Departments affiliated to Faculty of Arts:

- 1- Department of English language
- 2- Department of Sociology

D. Departments affiliated to Faculty of Commerce

- 1- Department of Business Administration and Accounting

E. Departments affiliated to Faculty of Law:

- 1- Department of Islamic Law

- 5. **Duration of program: 5 years + one academic year of internship**
- 6. **Language of study:** English.
- 7. **Academic Reference Standards:** National Academic Reference Standards (NARS) and Edition, April 2017 (National Authority for Quality Assurance and Accreditation).

Degree Obtained:

Pharm D Clinical Pharmacy

- 8. **Coordinator: Prof. Dr Ahmed M. A. Abdelmawla**
- 9. **External evaluation:**
- 10. **Program approval date:**

B– Professional Information

1) Program Aims:

The main program aims are providing the labor market needs with clinical pharmacists who will be leaders in developing innovative models of clinical practice, as well as, pharmacy practice and in education and clinical research.

So, the aims are summarized as:

- 1- Providing private and public hospitals with graduated clinical pharmacists having an influential impact on the pharmaceutical care and consequently on the therapeutic outcomes of patients in the clinical settings.
- 2- Dissemination effectively of drug information through the active role of clinical pharmacists who are acquainted and practiced on searching for medical information and managing drug information centers.
- 3- Permitting graduated clinical pharmacists in the various fields to be the most authorized persons in drug-drug interaction detection, problem solving and therapeutic regimen adjustments.
- 4- Graduating pharmacists who are acquiring better communication, leadership and entrepreneurial skills.
- 5- Achieving economic benefits in the future from applying evidence-based pharmacy practice and rationalizing drug use in hospitals and in community settings.
- 6- Practicing clinical pharmacy graduates to be engaged with research activities concerning clinical case studies and hence improving patients care and contributing in improving patients and community quality of life.

2) Graduate Attributes

1. Clinical pharmacy graduates work in multidisciplinary profession and should get the mandatory attributes in clinical pharmacy aspects in order to well tracking their career. Graduate attributes are the quality, skills and understandings of the faculty graduates. These attributes include the multidisciplinary expertise and the technical knowledge gained from the studied courses summarized as follows:

1. Provide counseling to patients and community about safe use, abuse and misuse of medications.

2. Being aware with all legal and ethical regulations related to pharmacy practice.
3. Handle chemicals, pharmaceutical materials and medicinal plants properly according to their properties and hazards.
4. Formulate, prepare and dispense different pharmaceutical dosage forms from different sources.
5. Store pharmaceutical preparations according to good storage practice and distribution procedures.
6. Perform analysis of raw materials, pharmaceutical dosage forms, herbal products, biological samples, biotechnological products according to GMP, GLP, FDA, ICH guidelines and official compendia procedures.
7. Classify laboratory wastes according to their type and hazards before their safe disposal.
8. Provide information and pharmacy services to community and patients about rational use of medications and medical devices.
9. Apply principles of pharmacology and toxicology in selecting appropriate drugs for patients and share effectively in design of therapeutic protocol to each patient.
10. Design and carry out research project using appropriate methodologies and resources.
11. Figure out the principles of disease pathophysiology and cooperate with health care professionals in improving the health care services and prevention of diseases.
12. Working in team with health care professionals and advise them about drug use, doses and drug-drug interactions.
13. Improve presentation, promotion, marketing and business administration skills as well as computation and statistical skills.
14. Show effective verbal and nonverbal communication, time management. Problem-solving and decision-making skills.
15. Improve professional skills through continuous education and life-long self-learning and self-assessment.

3) Program learning outcomes:

On successful completion of the program, graduates will acquire the following key competencies in the following domains:

Domain 1- Fundamental Knowledge

1-1- Competency

Graduates will be able to integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver pharmaceutical care.

This competency will be achieved through understanding and fulfilling the following key elements:

KEY ELEMENTS

- 1-1-1- Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.
- 1-1-2- Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.
- 1-1-3- Integrate knowledge from fundamental sciences to handle, identify, extract, design, prepare, analyze, and assure quality of synthetic/natural pharmaceutical materials/products.
- 1-1-4- Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.
- 1-1-5- Retrieve information from fundamental sciences to solve therapeutic problems.
- 1-1-6- Utilize scientific literature and collect and interpret information to enhance professional decision.
- 1-1-7- Identify and critically analyze newly emerging issues influencing pharmaceutical industry and patient health care.

DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

2-1- COMPETENCY

Work collaboratively as a member of an inter-professional health care team to improve the quality of life of individuals and communities, and respect patients' rights.

KEY ELEMENTS

- 2-1-1 Perform responsibilities and authorities in compliance with the legal and professional structure and role of all members of the health care professional team.
- 2-1-2 Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.
- 2-1-3 Recognize own personal and professional limitations and accept the conditions of referral to or guidance from other members of the health care team.

2-2- COMPETENCY

Standardize pharmaceutical materials, formulate and manufacture pharmaceutical products, and participate in systems for dispensing, storage, and distribution of medicines.

KEY ELEMENTS

- 2-2-1 Isolate, design, identify, synthesize, purify, analyze, and standardize synthetic/natural pharmaceutical materials.
- 2-2-2 Apply the basic requirements of quality management system in developing, manufacturing, analyzing, storing, and distributing pharmaceutical materials/products considering various incompatibilities.
- 2-2-3 Recognize the principles of various tools and instruments and select the proper techniques for synthesis and analysis of different materials and production of pharmaceuticals.
- 2-2-4 Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and biopharmaceutics and their applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice.

2-3- COMPETENCY

Handle and dispose biologicals and synthetic/natural pharmaceutical materials/products effectively and safely with respect to relevant laws and legislations.

KEY ELEMENTS

2-3-1 Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radio-labeled products, and other materials/products used in pharmaceutical field.

2-3-2 Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of biologicals, and pharmaceutical materials/products.

2-4- COMPETENCY

Actively share professional decisions and proper actions to save patient's life in emergency situations including poisoning with various xenobiotics, and effectively work in forensic fields.

KEY ELEMENTS

2-4-1 Ensure safe handling/use of poisons to avoid their harm to individuals and communities.

2-4-2 Demonstrate understanding of the first aid measures needed to save patient's life.

2-4-3 Take actions to solve any identified medicine-related and pharmaceutical care problems.

2-4-4 Assess toxicity profiles of different xenobiotics and detect poisons in biological specimens.

2-5- COMPETENCY

Contribute in pharmaceutical research studies and clinical trials needed to authorize medicinal products.

KEY ELEMENTS

2-5-1 Fulfill the requirements of the regulatory framework to authorize a medicinal product including quality, safety, and efficacy requirements.

2-5-2 Retrieve, interpret, and critically evaluate evidence-based information needed in pharmacy profession.

2-5-3 Contribute in planning and conducting research studies using appropriate methodologies.

2-6- COMPETENCY

Perform pharmacoeconomic analysis and develop promotion, sales, marketing, and business administration skills.

KEY ELEMENTS

- 2-6-1 Apply the principles of business administration and management to ensure rational use of financial and human resources.
- 2-6-2 Utilize the principles of drug promotion, sales, marketing, accounting, and pharmacoeconomic analysis.

DOMAIN 3: PHARMACEUTICAL CARE

3-1- COMPETENCY

Apply the principles of body functions to participate in improving health care services using evidence-based data.

KEY ELEMENTS

- 3-1-1 Apply the principles of body function and basis of genomics in health and disease states to manage different diseases.
- 3-1-2 Apply the principles of public health and pharmaceutical microbiology to select and assess proper methods of infection control.
- 3-1-3 Monitor and control microbial growth and carry out laboratory tests for identification of infections/diseases.
- 3-1-4 Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.

3-2- COMPETENCY

Provide counseling and education services to patients and communities about safe and rational use of medicines and medical devices.

KEY ELEMENTS

- 3-2-1 Integrate the pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, adverse drug reactions and drug interactions.
- 3-2-2 Apply the principles of clinical pharmacology and pharmacovigilance for the rational use of medicines and medical devices.
- 3-2-3 Provide evidence-based information about safe use of complementary medicine including phytotherapy, aromatherapy, and nutraceuticals.
- 3-2-4 Provide information about toxic profiles of drugs and other xenobiotics including sources, identification, symptoms, and management control. 3-2-5 Educate and counsel patients, other health care professionals, and communities about safe and proper use of medicines including OTC preparations and medical devices.

3-2-6 Maintain public awareness on social health hazards of drug misuse and abuse.

DOMAIN 4: PERSONAL PRACTICE

4-1- COMPETENCY

Express leadership, time management, critical thinking, problem solving, independent and team working, creativity and entrepreneurial skills.

KEY ELEMENTS

4-1-1 Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.

4-1-2 Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.

4-1-3 Demonstrate creativity and apply entrepreneurial skills within a simulated entrepreneurial activity.

4-2- COMPETENCY

Effectively communicate verbally, non-verbally and in writing with individuals and communities.

KEY ELEMENTS

4-2-1 Demonstrate effective communication skills verbally, non-verbally, and in writing with professional health care team, patients, and communities.

4-2-2 Use contemporary technologies and media to demonstrate effective presentation skills.

4-3- COMPETENCY

Express self-awareness and be a life-long learner for continuous professional improvement.

KEY ELEMENTS

4-3-1 Perform self-assessment to enhance professional and personal competencies.

4-3-2 Practice independent learning needed for continuous professional development.

National Academic Reference Standard (NARS)

1. Attributes of the Pharmacy Graduates

Pharmacy graduates work in a multi-disciplinary profession to improve the quality of life of individuals and communities. Based on multi-national requirements, the pharmacy graduate must develop competencies of a learner, health caregiver and provider, professional, collaborator, manager, promoter, problem solver, educator and communicator, self-aware, leader, and innovator. Pharmacy graduates must acquire the necessary attributes related to various pharmacy aspects including drug-oriented and patient-oriented pharmacy disciplines to actively participate in pharmaceutical care. Pharmacy graduate must be able to:

1. Educate and counsel individuals and communities to participate in optimizing therapeutic outcomes and minimizing the incidence of illness of individuals and populations.
2. Practice and perform responsibilities and authorities legally, professionally, and ethically respecting patients' rights.
3. Utilize evidence-based data to deliver contemporary pharmaceutical products and pharmacy services.
4. Assure the quality of pharmaceutical materials and products.
5. Apply integrated evidence-based pharmaceutical and clinical information in assessing the appropriateness, effectiveness, and safety of medications.
6. Contribute effectively in planning and conducting research using appropriate methodologies.
7. Work collaboratively and share therapeutic decision-making as a member of an inter-professional health care team.
8. Demonstrate effective communication, leadership, business administration, and entrepreneurial skills.
9. Work as a life-long learner for continuous professional improvement and demonstrate capabilities of performance appraisal and self-assessment.

Coverage of National Academic Reference Standards graduate attributes by the Faculty of Pharmacy Clinical program graduate attributes

1	Attributes of graduates set by NARS	Attributes of graduates set by Faculty of Pharmacy Clinical program
<u>1.1</u>	Educate and counsel individuals and communities to participate in optimizing therapeutic outcomes and minimizing the incidence of illness of individuals and populations.	1. Provide counseling to patients and community about safe use, abuse and misuse of medications.
<u>1.2</u>	Practice and perform responsibilities and authorities legally, professionally, and ethically respecting patients' rights.	2. Being aware with all legal and ethical regulations related to pharmacy practice.
<u>1.3</u>	Utilize evidence-based data to deliver contemporary pharmaceutical products and pharmacy services.	3. Handle chemicals, pharmaceutical materials and medicinal plants properly according to their properties and hazards. 4. Formulate, prepare and dispense different pharmaceutical dosage forms from different sources. 5. Store pharmaceutical preparations according to good storage practice and distribution procedures.
<u>1.4</u>	Assure the quality of pharmaceutical materials and products.	6. Perform analysis of raw materials, pharmaceutical dosage forms, herbal products, biological samples, biotechnological products according to GMP, GLP, FDA, ICH guidelines and official compendia procedures. 7. Classify laboratory wastes according to their type and hazards before their safe disposal.

<u>1.5</u>	Apply integrated evidence-based pharmaceutical and clinical information in assessing the appropriateness, effectiveness, and safety of medications.	8. Provide information and pharmacy services to community and patients about rational use of medications and medical devices. 9. Apply principles of pharmacology and toxicology in selecting appropriate drugs for patients and share effectively in design of therapeutic protocol to each patient.
<u>1.6</u>	Contribute effectively in planning and conducting research using appropriate methodologies.	10. Design and carry out research project using appropriate methodologies and resources.
<u>1.7</u>	Work collaboratively and share therapeutic decision-making as a member of an inter-professional health care team.	11. Figure out the principles of disease pathophysiology and cooperate with health care professionals in improving the health care services and prevention of diseases. 12. Working in team with health care professionals and advise them about drug use, doses and drug-drug interactions.
<u>1.8</u>	Demonstrate effective communication, leadership, business administration, and entrepreneurial skills.	13. Improve presentation, promotion, marketing and business administration skills as well as computation and statistical skills. 14. Show effective verbal and nonverbal communication, time management. Problem-solving and decision-making skills.
<u>1.9</u>	Work as a life-long learner for continuous professional improvement and demonstrate capabilities of performance appraisal and self-assessment.	15. Improve professional skills through continuous education and life-long self-learning and self-assessment.

The program complies entirely with the latest NARS 2017 (Pharmacy Council No. 675 Date 17-9-2019)

Program admission requirements:

The faculty complies with the admission regulations and requirements of the Egyptian Supreme Council of Universities (ESCU). Candidate should have obtained the general certificate of secondary education (scientific section) or an equivalent certificate from a foreign institute recognized by ESCU.

Teaching and learning:

The teaching and learning approaches within this program were chosen to meet; stated learning objectives, including: Lectures, case studies, discussion, brain storming practical sessions, tutorials, field visits and summer training course. The details of Teaching and learning methods are mentioned in faculty the teaching and learning strategy.

Assessment:

- Methods of assessments include written oral and practical examination, research paper, course assignments, periodical assessment, presentation, library exercise and practical work.
- Student performance is assessed by both course work and examination at the end of each course.

Method of assessment	Weight of assessment				
	Group A	Group B	Group C	Group D	Group E
Written examination	75	50	60	75	40
Practical examination and activities	40	25	25	-	--
Periodical examination	20	15	15	25	10
Oral examination	15	10	--	--	--
Total	150	100	100	100	50

Group A &B: program courses taught through lecture and practical are assessed by all methods.

Group C: program courses taught through lecture and practical are assessed by all methods except oral examination.

Group D&E: program courses taught through lectures only are assessed by written examination.

The minimum pass rate in any course is 60% of the total grades of this program. The student will not be successful in any course unless he or she received 30% of the final written exam score.

The percentage of final scores and estimates is as shown in the following table.

Evaluation system

Percentage	Symbol	Number of Points	Grade
95 and above	A ⁺	4	Excellent
90 for less than 95	A	3.8	
85 for less than 90	A ⁻	3.6	
82.5 for less than 85	B ⁺	3.4	very good
77.5 for less than 82.5	B	3.2	
75 for less than 77.5	B ⁻	3	
72.5 for less than 75	C ⁺	2.8	good
67.5 for less than 72.5	C	2.6	
65 for less than 67.5	C ⁻	2.4	
62.5 for less than 65	D ⁺	2.2	acceptable
60 for less than 62.5	D	2	
Less than 60	F	0	Deposit
Withdrawal - W	W	-	Withdrawal
Incomplete - I *	I*	-	Incomplete
Absent - Abs E **	Abs E**	-	Absent

The student's GPA and CGPA are calculated as follows:

A- The points of each course are calculated according to the following equation:

$$\text{Course Points (CGP)} = (\text{Degree} - 60) \times 0.075 + 1$$

B - The value of points for each course is multiplied by the number of credit hours for this course to get the number of points for each course in the semester.

C - Points are collected for all the courses in which the student scored in one semester.

D- The total points of all courses shall be divided by the total credit hours registered for the student per semester for the purpose of obtaining the semester average as follows:

The semester rate (GPA) =

$$\frac{\text{Total points of all courses per semester}}{\text{Total credit hours registered per semester}}$$

The cumulative GPA is calculated as follows:

Cumulative Grade Point Average (cGPA) =

$$\frac{\text{The sum of points for all courses for all semesters}}{\text{Total credit hours registered for all semesters}}$$

Registration and academic supervision:

The faculty assigns each group of students an academic advisor from the faculty who carries out the care and guidance tasks and is responsible for the student in the scientific, social and psychological affairs and guidance in all matters relating to his university life and helps students in the selection of courses from the list of courses offered by the faculty in each semester.

Each student must personally register the courses he / she wishes to study in each semester, with the need to choose the courses and the number of credit hours in

consultation and agreement with the academic advisor. To be enrolled, the student must have successfully passed the registration requirement.

The College Council may, in cases of extreme necessity, register some courses in line with its requirements that the student has not successfully passed if the student's available study load is less than 12 credit hours, provided that a declaration is written by the student's parent. His success in this course will only be approved after passing the requirement for which he was allowed to register in parallel.

Requirements for Pharm D (Clinical Pharmacy)

The Pharm D (Clinical Pharmacy) according to the credit hour system requires the following:

First: Study and pass 177 credit hours spread over ten semesters, including the faculty elective courses provided that the cumulative average (CGPA) of the student must not less than two.

Second: Passing the university's requirements for graduation, provided that it does not included in evaluation of the CGPA of the student.

Third: Passing a first field training period with a total of 100 actual training hours in private or governmental pharmacies and also in hospital pharmacies, under supervision and approval of faculty council and faculty staff members (After finishing 3rd level of study and before the last level).

Fourth: Passing the second step of the field training, (Training for 9 months after finishing the 5th level). The training (internship) is assigned to specific areas and student must complete a graduation project in this specialty.

Fifth: Completing the sixth academic year of internship in the credited practice area according to the bylaw.

Training:

The student must complete the internship year after completing the academic years (177 credit hours) with a duration of 36 weeks. It is divided into six training courses, with at least

four courses inside hospitals that implement clinical pharmacy practice, and one course is devoted to training in one of the pharmaceutical fields (manufacturing – drug control,... etc.), so that the training program is integrated and systematic in a periodic, rotating manner recorded in hours and training tasks and under strict supervision from the college and the training destination.

Specialization:

The student submits a graduation project in a certain specialization that contributes to prepare the student to acquire this specialty. The graduate can work in this field for a period of two years, after which he becomes a specialized pharmacist capable of providing clinical pharmacy services in this speciality.

The training program is designed in different clinical pharmacy disciplines (such as: cardiovascular disease, oncology, pediatric, psychological and neurological diseases, clinical nutrition, critical care, drug information, drug pharmacoeconomics...) according to the university's capabilities and the community's needs within the university.

Regulations for progression and program completion:

- A student required to attend 75% of lectures and laboratory sections continuously.
- Selection of courses for any given year is conditional on the successful completion of the prerequisite course of the proceeding academic year.
- Student who fails to pass a required course will be allowed to repeat this course.
- Student who fails to pass an elective course will be allowed to repeat this course or register for another elective course.

Academic difficulty:

- A student who fails to maintain a minimum cumulative GPA of "2" for six consecutive semesters or for a total of ten semesters will be dismissed from the faculty.

C- Curriculum Structure and contents:

Program duration: 5 years + one academic year of internship

Program structure:

No. of credit hours:

Lectures: 125 hrs Lab / Exercise: 56 hrs Total: 181 hrs

These 181 credit hours are divided as follows:

University requirements: 4 credit hrs

Faculty requirements: 169 credit hrs

Elective courses: 8 credit hrs

Practical/Field Training: 100 credit hrs

Program levels (in credit hours system): 5 levels / 10 semesters

D- Professional Information

1-Academic standards

Adoption of program curriculum to academic standards (NARS).

Subject	CR hours	Clinical Program (%)	NARS (%)
1- Basic Sciences	17	9.39	10-15
2- Pharmaceutical Sciences	66	36.46	35-40
3- Medical Sciences	37	20.44	15-25
4- Pharmacy Practice	36	19.88	10-15
5- Health and environmental Sciences	10	5.52	5-10
6- Behavioral and Social Sciences	5	2.76	2-4
7- Pharmacy management, Marketing and Pharmacoeconomics	2	1.10	2-4
8- Elective and complementary courses	8	4.41	Up to 8.0 %
Total	181	100	

Generally, the ratios of the subjects are within those set by NARS, with some increase in the ratio of the group of pharmacy practice and on the other hand, little decrease in both basic science courses and pharmacy management groups.

2. Program curriculum structure

Number of studying hours per week in each level of program

	Lectures	Lab	Total	%
Basic Sciences	17	7	24	13.25
Pharmaceutical Sciences	47	20	67	37.0
Medical Sciences	26	11	37	20.44
Pharmacy Practice	18	10	28	15.46
Health and environmental Sciences	7	3	10	5.52
Behavioral and Social Sciences	4	1	5	2.76
Pharmacy management, Marketing and Pharmacoeconomics	2	-	2	1.10
Elective and complementary courses	8	4	8	4.41

- Skeleton of the program with contribution of different courses

Subject	Cr.hrs			%	
	Lectures	Practical	Total	Clin	NARS
1-Basic Sciences					
English language (EN 101)	2	-	2	13.25	10-15
Pharmaceutical organic chemistry (PR 102, 202)	4	2	6		
Pharmaceutical analytical chemistry (PA 101)	2	1	3		
Mathematics (NP 102)	1	-	1		
Pharmaceutical organic chemistry (PR 303)	2	1	3		
Instrumental analysis (PA 503)	1	-	1		
Pharmaceutical analytical chemistry (PA 202)	2	1	3		
Information Technology (NP 201)	1	1	2		
Cell Biology (PB 101)	1	1	2		
Scientific writing (NP 605)	1	-	1		
Sum	17	7	24		
2- Pharmaceutical Sciences					
Medicinal plants (PG101)	2	1	3	36.46	35-40
Physical pharmacy (PT 202)	2	1	3		
Pharmacy orientation (PT 101)	1	-	1		

Hospital pharmacy (PP 602)	2	1	3		
Drug information (PP 704)	2	-	2		
Clinical Pharmacokinetic (PP807)	2	1	3		
Pharmaceutical technology (PI 801)	2	1	3		
Biopharmaceutics and pharmacokinetics (PT 707)	2	1	3		
Medicinal chemistry (PC 501, 602, 703)	6	2	8		
Quality Control of Pharmaceuticals (PA 704)	2	1	3		
Pharmacognosy (PG 202, 303)	4	2	6		
Phytochemistry (PG 504, 605)	4	2	6		
Pharmaceutical microbiology (PM 502)	2	1	3		
Pharmaceutical biotechnology (PM 904)	1	1	2		
Sterile dosage forms (PT 606)	1	-	1		
Phytotherapy (PG 006)	2	1	3		
Pharmaceutical dosage forms (PT 303, 404, 505)	6	3	9		
Advanced Drug Delivery Systems (PT 808)	2	-	2		
Clinical nutrition (PP 905)	1	1	2		
Pharmaceutical legislation (PT 404)	1	-	1		
Sum	47	20	67		
3-Medical Sciences				20.44	15-25
Anatomy and Histology (MD 201)	2	1	3		
Physiology and Pathophysiology (MD 302)	2	1	3		
Pathology (MD 403)	2	-	2		
Biochemistry (PB 302, 403)	4	2	6		
Clinical biochemistry (PB 704)	2	1	3		
Parasitology (MD 404)	1	1	2		
Pharmacology (PO 302, 403,504, 605)	8	3	11		
General Microbiology and immunology (PM 401)	2	1	3		
Medical microbiology (PM 603)	2	1	3		
Medical terminology (PO101)	1	-	1		
Sum	26	11	37		
4- Pharmacy Practice				15.46	10-15
Clinical Pharmacy (PP 703)	2	1	3		
Clinical Research and Pharmacovigilance (PP 911)	1	-	1		
- Pharmacotherapy of Endocrine and Renal Diseases (PP 805)	15	9	24		
- Pharmacotherapy of Oncological Diseases (PP 806)					
- Pharmacotherapy of Neuropsychiatric Diseases (PP 908)					
- Pharmacotherapy of Cardiovascular					

Diseases(PP 909) - Pharmacotherapy of Critical Care Patients (PP 910) - Pharmacotherapy of Dermatological and Musculoskeletal Diseases (PP 012) - Pharmacotherapy of Pediatric Diseases (PP 013) - Pharmacotherapy of Gastrointestinal Diseases (PP 014) - Pharmacotherapy of respiratory diseases (PP 015)					
Sum	18	10	28		
5- Health and Environmental Sciences				5.52	5 – 10
Public health and preventive medicine (MD 806)	2	-	2		
First aid basic life support (BLS) (MD 505)	1	1	2		
Toxicology and forensic chemistry (PO 906)	2	1	3		
Community pharmacy (PP 601)	2	1	3		
Sum	7	3	10		
6- Behavioral and Social Sciences				2.76	2 – 4
Psychology (UR 202)	1	-	1		
Social Issues (UR 203)	1	-	1		
Communication skills (NP 403)	1	1	2		
Entrepreneurship (NP 007)	1	-	1		
Sum	4	1	5		
7- Pharmacy Management, Marketing and Pharmacoeconomics				1.10	2 – 5
Drug marketing and Pharmacoeconomics (NP 006)	2	-	2		
Sum	2	-	2		
8- Elective and Complementary Courses (PE)				4.41	2 – 5
Sum	4	4	8		
Total credit hours				181	

PROGRAMME COURSES:

Table (1)

Semester (1)

Course Title	Course Code	Credit hours			Prerequisite	Examination Marks				Total. marks	Final Exam (hrs)
		Lect	Pract	Total		Period	Pract	Wr.	Oral		
Pharmaceutical Analytical chemistry-I	PA 101	2	1	3	Registration	20	40	75	15	150	2
Pharmaceutical Organic chemistry-I	PR 101	2	1	3	Registration	20	40	75	15	150	2
Pharmacy Orientation	PT 101	1	-	1	Registration	10	-	40	-	50	1
Medicinal Plants	PG 101	2	1	3	Registration	20	40	75	15	150	2
Medical Terminology	PO 101	1	-	1	Registration	10	-	40	-	50	1
Cell Biology	BP 101	1	1	2	Registration	15	25	60	-	100	1
Mathematics	NP102	1	-	1	Registration	10	-	40	-	50	1
English language*	UR 101	2	-	2	Registration	25	-	75	-	100	2
Total		10+2	4	14+2						800	

Lect. = Lecture Period. = Periodical Pract. = Practical Wr. = Written

*متطلب جامعة بتقدير نجاح ورسوب فقط دون اضافة درجات للمجموع التراكمي

Table (2)

Semester (2)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total. marks	Final Exam (hrs)
		Lect.	Pract	Total		Period	Pract.	Wr.	Oral		
Pharmaceutical Analytical chemistry-II	PA 202	2	1	3	Pharmaceutical Analytical chemistry-I	20	40	75	15	150	2
Pharmaceutical Organic chemistry-II	PR 202	2	1	3	Pharmaceutical Organic chemistry-I	20	40	75	15	150	2
Information Technology	NP 201	1	1	2	Registration	15	25	60	-	100	1
Anatomy & Histology	MD 201	2	1	3	Registration	20	40	75	15	150	2
Physical pharmacy	PT 202	2	1	3	Registration	20	40	75	15	150	2
Pharmacognosy -I	PG 202	2	1	3	Medicinal Plants	20	40	75	15	150	2
Psychology*	UR 202	1	-	1	Registration	10	-	40	-	50	1
Social Issues*	UR 203	1	-	1	Registration	10	-	40	-	50	1
Total		11+2	6	17+2						950	

Lect. = Lecture Period. = Periodical Pract. = Practical Wr. = Written

*متطلب جامعة بتقدير نجاح ورسوب فقط دون اضافة درجات للمجموع التراكمي

Table (3)**Semester (3)**

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total. marks	Final Exam (hrs)
		Lect	Pract	Total		Period	Pract	Wr	Oral		
Pharmaceutical Organic chemistry-III	PR 303	2	1	3	Organic pharmaceutical chemistry-II	20	40	75	15	150	2
Biochemistry-I	PB 302	2	1	3	Cell Biology	20	40	75	15	150	2
Pharmacognosy -II	PG 303	2	1	3	Pharmacognosy -I	20	40	75	15	150	2
Basic Pharmacology	PO 302	2	1	3	Registration	20	40	75	15	150	2
Physiology and Pathophysiology	MD 302	2	1	3	Registration	20	40	75	15	150	2
Pharmaceutical Dosage forms- I	PT 303	2	1	3	Physical Pharmacy	20	40	75	15	150	2
Total		12	6	18						900	

Lect. = Lecture

Period. = Periodical

Pract. = Practical

Wr. = Written

Table (4)**Semester (4)**

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total. marks	Final Exam. (hrs)
		Lect	Pract	Total		Period.	Pract	Wr	Oral		
Pharmacology -I	PO 403	2	1	3	Basic Pharmacology	20	40	75	15	150	2
General Microbiology and Immunology	PM 401	2	1	3	Cell Biology	20	40	75	15	150	2
Communication Skills	NP 403	1	1	2	Registration	15	25	60	-	100	1
Pathology	MD 403	2	-	2	Registration	25	-	75	-	100	2
Pharmaceutical dosage forms-II	PT 404	2	1	3	Physical Pharmacy	20	40	75	15	150	2
Biochemistry -II	PB 403	2	1	3	Biochemistry -I	20	40	75	15	150	2
Pharmacy legislation and Ethics	NP 404	1	-	1	Registration	10	-	40	-	50	1
Parasitology	MD 404	1	1	2	Registration	15	25	50	10	100	1
Total		13	6	19						950	

Lect. = Lecture

Period. = Periodical

Pract. = Practical

Wr. = Written

Table (5)**Semester (5)**

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total. marks	Final Exam. (hrs)
		Lect.	Pract	Total		Period	Pract	Wr.	Oral		
Pharmacology -II	PO 504	2	1	3	Basic Pharmacology	20	40	75	15	150	2
Pharmaceutical Microbiology	PM 502	2	1	3	General microbiology & immunology	20	40	75	15	150	2
Instrumental Analysis	PA 503	1	-	1	Pharmaceutical Analytical chemistry-II	10	-	40	-	50	1
Medicinal chemistry-I	PC 501	2	1	3	Pharmaceutical Organic chemistry-II	20	40	75	15	150	2
Pharmaceutical dosage forms-III	PT505	2	1	3	Physical Pharmacy	20	40	75	15	150	2
Phytochemistry-I	PG 504	2	1	3	Pharmacognosy-II	20	40	75	15	150	2
First Aid and Basic Life Support (BLS)	MD 505	1	1	2	Registration	15	25	60	-	100	1
Total		12	6	18						900	

Lect. = Lecture Period. = Periodical Pract. = Practical Wr. = Written

Table (6)**Semester (6)**

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total. marks	Final Exam. (hrs)
		Lect.	Pract	Total		Period.	Prac	Wr.	Oral		
Pharmacology -III	PO 605	2	-	2	Pharmacology -I	15	-	75	10	100	2
Phytochemistry-II	PG 605	2	1	3	Phytochemistry-I	20	40	75	15	150	2
Medicinal chemistry-II	PC 602	2	1	3	Medicinal chemistry-I	20	40	75	15	150	2
Hospital Pharmacy	PP 602	2	1	3	Pharmacy legislation and Ethics	20	40	75	15	150	2
Medical Microbiology	PM 603	2	1	3	General microbiology & immunology	20	40	75	15	150	2
Community Pharmacy	PP 601	1	-	1	Pharmacology -I	20	40	75	15	150	2
Sterile Dosage Forms	PT 606	2	1	3	Pharmaceutical dosage forms-I	10	-	40	-	50	1
Scientific Writing	NP 605	1	-	1	Registration	10	-	40	-	50	1
Total		14	5	19						950	

Table (7) Semester (7)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total. marks	Final Exam (hrs)
		Lect.	Pract	Total		Period	Pract	Wr.	Oral		
Medicinal Chemistry-III	PC 703	2	-	2	Medicinal Chemistry-I	15	-	75	10	100	2
Quality Control of Pharmaceuticals	PA 704	2	1	3	Pharmaceutical Analytical Chemistry-II	20	40	75	15	150	2
Clinical Biochemistry	PB 704	2	1	3	Biochemistry -II	20	40	75	15	150	2
Biopharmaceutics and pharmacokinetics	PT 707	2	1	3	Pharmaceutical dosage forms-III	20	40	75	15	150	2
Clinical Pharmacy	PP 703	2	1	3	Pharmacology -I	20	40	75	15	150	2
Drug Information	PP 704	2	-	2	Pharmacology -III	15	-	75	10	100	2
Elective course	PE--	1	1	2	Registration	15	25	50	10	100	1
Total		13	5	18						900	

Lect. = Lecture Period. = Periodical Pract. = Practical Wr. = Written

Table (8)**Semester (8)**

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total. marks	Final Exam (hrs)
		Lect.	Pract	Total		Period	Pract	Wr.	Oral		
Pharmacotherapy of Endocrine and Renal diseases	PP 805	2	1	3	Pharmacology -III	20	40	75	15	150	2
Pharmacotherapy of Oncological Diseases	PP 806	2	1	3	Pharmacology -III	20	40	75	15	150	2
Clinical pharmacokinetics	PP 807	2	1	3	Biopharmaceutics and pharmacokinetics	20	40	75	15	150	2
Advanced Drug Delivery Systems	PT 808	2	-	2	Registration	15	-	75	10	100	2
Pharmaceutical Technology	PI 801	2	1	3	Pharmaceutical dosage forms-II	20	40	75	15	150	2
Public health and preventive medicine	MD 806	2	-	2	General microbiology & immunology	25	-	75		100	2
Elective course	PE	1	1	2	Registration	15	25	50	10	100	1
Total		13	5	18						900	

Lect. = Lecture Period. = Periodical Pract. = Practical Wr. = Written

Table (9)**Semester (9)**

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total. marks	Final Exam. (hrs)
		Lect.	Pract	Total		Period.	Pract	Wr.	Oral		
Toxicology and forensic chemistry	PO 906	2	1	3	Pharmacology -III	20	40	75	15	150	2
Pharmacotherapy of Neuropsychiatric Diseases	PP 908	2	1	3	Pharmacology -III	20	40	75	15	150	2
Pharmacotherapy of Cardiovascular Diseases	PP 909	2	1	3	Pharmacology -III	20	40	75	15	150	2
Pharmacotherapy of Critical Care Patients	PP 910	1	1	2	Pharmacology -III	15	25	50	10	100	1
Clinical Research and Pharmacovigilance	PP 911	1	-	1	Drug Information	10	-	40	-	50	1
Clinical Nutrition	PB 905	1	1	2	Biochemistry-II	15	25	50	10	100	1
Pharmaceutical Biotechnology	PM 904	1	1	2	General microbiology & immunology	15	25	50	10	100	1
Elective course	PE	1	1	2	Registration	15	25	50	10	100	1
Total		11	7	18						900	

Lect. = Lecture

Period. = Periodical

Pract. = Practical

Wr. = Written

Table (10)**Semester (10)**

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total. marks	Final Exam (hrs)
		Lect.	Pract.	Total		Period	Pract	Wr.	Oral		
Pharmacotherapy of Dermatological and Musculoskeletal Diseases	PP 012	1	1	2	Pharmacology -II	15	25	50	10	100	1
Pharmacotherapy of Pediatric Diseases	PP 013	2	1	3	Pharmacology -III	15	40	75	15	150	2
Pharmacotherapy of Gastrointestinal Diseases	PP 014	2	1	3	Pharmacology-III	15	40	75	15	150	2
Pharmacotherapy of Respiratory Diseases	PP 015	1	1	2	Pharmacology-III	15	25	50	10	100	1
Phytotherapy	PG 006	2	1	3	Phytochemistry-II	15	40	75	15	150	2
Marketing and Pharmacoeconomics	NP 006	2	-	2	Registration	25	-	75	-	100	2
Entrepreneurship	NP 007	1	-	1	Registration	10	-	40	-	50	1
Elective course	PE	1	1	2	Registration	15	25	50	10	100	1
Total		12	6	18						900	

Elective Courses

The faculty of Pharmacy offers elective courses from which the students are free to select eight credits.

Course Code	Course Title	Credit Hours		
		L	P	Total
PA E05	Advanced Pharmaceutical Analysis-Spectroscopy	1	1	2
PA E06	Environmental Analysis	1	1	2
PA E07	Forensic Analysis	1	1	2
PB E06	Cancer Biology	1	1	2
PB E07	Radioisotopes in Biochemistry and Medicine	1	1	2
PB E08	Tissue Metabolism	1	1	2
PC E04	Drug Design	1	1	2
PC E05	Medicinal Chemistry of Supplementary Drugs and Nutraceuticals	1	1	2
PC E06	Nanochemistry and Related Aspects	1	1	2
PG E07	Complementary and Alternative Therapies	1	1	2
PG E08	Production and Manufacture of Medicinal Plants	1	1	2
PG E09	Poisonous Plants	1	1	2
PI E02	Applied Industrial Pharmacy	1	1	2
PI E03	Good Manufacturing Practices	1	1	2
PI E04	Drug Manufacturing	1	1	2
PM E05	Molecular Biology and Epigenetics	1	1	2
PM E06	Infection Control	1	1	2
PM E07	Antimicrobial stewardship	1	1	2
PO E07	Biological Standardization	1	1	2
PO E08	Drug Interactions	1	1	2
PP E16	Precision Pharmacy	1	1	2
PP E17	Advanced Pharmaceutical Care	1	1	2
PP E18	Radiopharmacy	1	1	2
PR E04	Recent Techniques of Structure Elucidation	1	1	2
PR E05	Green Chemistry	1	1	2
PR E06	Advanced Level of Drug Synthesis	1	1	2
PT E09	Cosmetic Preparations	1	1	2

PT E10	Clinical Pharmaceutics	1	1	2
PT E11	Drug Targeting	1	1	2

Student chooses one elective course in each semester from the 7th semester

Course name		Program DOMAIN 1 (FUNDAMENTAL KNOWLEDGE)						
		COMPETENCY (1-I)						
		1	2	3	4	5	6	7
1	Pharmaceutical Analytical Chemistry I	✓	✓					
2	Pharmaceutical Organic Chemistry I	✓	✓	✓			✓	
3	Pharmacy Orientation	✓	✓	✓				
4	Medicinal Plants	✓	✓	✓				
5	Medical Terminology	✓	✓					
6	Information Technology	✓				✓		
7	Mathematics				✓	✓		
8	English Language*	✓	✓					
9	Pharmaceutical Analytical Chemistry II	✓	✓	✓				
10	Pharmaceutical Organic Chemistry II	✓		✓				
11	Cell Biology						✓	
12	Anatomy & Histology	✓	✓		✓			
13	Physical Pharmacy	✓	✓	✓	✓			
14	Pharmacognosy I	✓	✓	✓		✓		
15	Psychology*	✓	✓					
16	Social Issues*	✓	✓					
17	Pharmaceutical Organic chemistry-III	✓	✓	✓				
18	Biochemistry-I	✓		✓				✓
19	Pharmacognosy -II	✓	✓	✓	✓			
20	Basic Pharmacology	✓	✓		✓	✓		✓
21	Physiology and Pathophysiology	✓	✓		✓	✓		
22	Pharmaceutical Dosage forms- I	✓	✓	✓	✓			
23	Pharmacology -I	✓	✓		✓		✓	
24	General Microbiology and Immunology	✓	✓			✓	✓	

Course name		Program DOMAIN 1 (FUNDAMENTAL KNOWLEDGE)						
		COMPETENCY (I-I)						
		1	2	3	4	5	6	7
25	Communication Skills	√	√	√	√	√	√	
26	Pathology	√	√		√	√		
27	Pharmaceutical dosage forms-II	√		√				
28	Biochemistry -II	√		√	√			√
29	Pharmacy legislation and Ethics	√						
30	Parasitology	√	√		√	√		
31	Pharmacology -II	√	√		√	√	√	
32	Pharmaceutical Microbiology	√	√			√	√	
33	Instrumental Analysis	√	√	√		√	√	
34	Medicinal chemistry-I			√	√			
35	Pharmaceutical dosage forms-III	√	√	√	√	√		
36	Phytochemistry-I			√	√	√	√	
37	First Aid and Basic Life Support (BLS)	√	√		√	√		
38	Pharmacology -III	√	√		√	√		
39	Phytochemistry-II	√	√	√				
40	Medicinal chemistry-II	√	√	√	√	√	√	
41	Hospital Pharmacy	√	√					
42	Medical Microbiology	√	√			√	√	
43	Community Pharmacy	√	√	√	√			
44	Sterile Dosage Forms	√	√	√	√			
45	Scientific Writing	√	√				√	
46	Medicinal Chemistry-III			√	√			
47	Quality Control of Pharmaceuticals							√
48	Clinical Biochemistry	√	√					

Course name		Program DOMAIN 1 (FUNDAMENTAL KNOWLEDGE)						
		COMPETENCY (I-I)						
		1	2	3	4	5	6	7
49	Biopharmaceutics and pharmacokinetics	✓	✓	✓	✓	✓	✓	✓
50	Clinical Pharmacy	✓	✓		✓	✓	✓	
51	Drug Information		✓		✓	✓	✓	✓
52	Pharmacotherapy of Endocrine and Renal diseases	✓	✓		✓	✓	✓	✓
53	Pharmacotherapy of Oncological Diseases	✓	✓		✓	✓	✓	✓
54	Clinical pharmacokinetics	✓	✓	✓	✓	✓	✓	✓
55	Advanced Drug Delivery Systems	✓	✓	✓		✓		✓
56	Pharmaceutical Technology	✓	✓	✓				✓
57	Public health and preventive medicine	✓	✓		✓	✓	✓	
58	Toxicology and forensic chemistry				✓	✓	✓	✓
59	Pharmacotherapy of Neuropsychiatric Diseases	✓	✓		✓	✓	✓	✓
60	Pharmacotherapy of Cardiovascular Diseases	✓	✓		✓	✓	✓	✓
61	Pharmacotherapy of Critical Care Patients	✓	✓		✓	✓	✓	✓
62	Clinical Research and Pharmacovigilance	✓				✓	✓	✓
63	Clinical Nutrition	✓	✓			✓	✓	✓
64	Pharmaceutical Biotechnology	✓	✓	✓	✓	✓	✓	✓
65	Pharmacotherapy of Dermatological and Musculoskeletal Diseases	✓	✓		✓	✓	✓	✓
66	Pharmacotherapy of Pediatric Diseases	✓	✓		✓	✓	✓	✓
67	Pharmacotherapy of Gastrointestinal Diseases	✓	✓		✓	✓	✓	✓
68	Pharmacotherapy of Respiratory Diseases	✓	✓		✓	✓	✓	✓
69	Phytotherapy	✓	✓	✓	✓	✓		
70	Marketing and Pharmacoeconomics	✓	✓					
71	Entrepreneurship	✓	✓					

Course name		Program DOMAIN 1 (FUNDAMENTAL KNOWLEDGE)						
		COMPETENCY (1-1)						
		1	2	3	4	5	6	7
Elective course								
1	Drug Design			√	√			
2	Production and Manufacture of Medicinal Plants	√	√	√	√	√	√	√
3	Good Manufacturing Practices	√	√	√				√
4	Drug Manufacturing	√	√	√				√
5	Biological Standardization	√		√	√			
6	Drug Interactions					√	√	
7	Precision Pharmacy	√	√	√	√			
8	Advanced Pharmaceutical Care	√	√	√	√	√	√	
9	Recent Techniques of Structure Elucidation			√				
10	Cosmetic Preparations	√	√	√	√			
11	Clinical Pharmaceuticals	√	√	√	√	√	√	
12	Drug Targeting	√	√	√				

Course name		Program DOMAIN 2 (PROFESSIONAL AND ETHICAL PRACTICE)																			
		(2-1)				(2-2)				(2-3)				(2-4)				(2-5)			
		1	2	3		1	2	3	4	1	2			1	2	3	4	1	2	3	4
1	Pharmaceutical Analytical Chemistry I																				
2	Pharmaceutical Organic Chemistry I	✓				✓		✓	✓	✓										✓	
3	Pharmacy Orientation	✓	✓	✓					✓												
4	Medicinal Plants					✓	✓			✓											
5	Medical Terminology																		✓		
6	Information Technology								✓												
7	Mathematics																				
8	English Language*																				
9	Pharmaceutical Analytical Chemistry II																				
10	Pharmaceutical Organic Chemistry II					✓	✓	✓	✓										✓	✓	
11	Cell Biology									✓	✓						✓		✓	✓	
12	Anatomy & Histology																				
13	Physical Pharmacy								✓												
14	Pharmacognosy I	✓				✓				✓											
15	Psychology*																				
16	Social Issues *																				
17	Pharmaceutical Organic chemistry-III					✓		✓	✓	✓											
18	Biochemistry-I	✓								✓	✓						✓		✓	✓	
19	Pharmacognosy -II	✓				✓				✓											
20	Basic Pharmacology		✓						✓								✓		✓		
21	Physiology and Pathophysiology																				
22	Pharmaceutical Dosage forms-I														✓	✓	✓				
23	Pharmacology -I			✓					✓								✓		✓		

Course name		Program DOMAIN 2 (PROFESSIONAL AND ETHICAL PRACTICE)																							
		(2-1)			(2-2)			(2-3)			(2-4)			(2-5)			(2-6)			(2-7)			(2-8)		
		1	2	3	1	2	3	4	1	2	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
24	General Microbiology and Immunology	✓	✓	✓						✓			✓		✓		✓								
25	Communication Skills	✓	✓	✓							✓	✓	✓	✓											
26	Pathology	✓	✓	✓					✓	✓															
27	Pharmaceutical dosage forms-II							✓																	
28	Biochemistry -II		✓											✓											
29	Pharmacy legislation and Ethics	✓	✓																						
30	Parasitology	✓	✓	✓																					
31	Pharmacology -II		✓	✓						✓															
32	Pharmaceutical Microbiology												✓												
33	Instrumental Analysis				✓				✓																
34	Medicinal chemistry-I				✓																				
35	Pharmaceutical dosage forms-III				✓	✓	✓																		
36	Phytochemistry-I				✓	✓	✓				✓	✓													
37	First Aid and Basic Life Support (BLS)												✓												
38	Pharmacology -III													✓											
39	Phytochemistry-II				✓				✓																
40	Medicinal chemistry-II				✓	✓	✓																		
41	Hospital Pharmacy	✓	✓																✓						
42	Medical Microbiology	✓	✓	✓																					
43	Community Pharmacy	✓	✓																						
44	Sterile Dosage Forms						✓																		
45	Scientific Writing	✓	✓																						
46	Medicinal Chemistry-III				✓				✓																
47	Quality Control of Pharmaceuticals																								

Course name		Program DOMAIN 2 (PROFESSIONAL AND ETHICAL PRACTICE)																									
		(2-1)			(2-2)				(2-3)				(2-4)				(2-5)			(2-6)							
		1	2	3	1	2	3	4	1	2	1	2	3	4	1	2	3	1	2								
48	Clinical Biochemistry																										
49	Biopharmaceutics and pharmacokinetics	√	√	√			√					√															
50	Clinical Pharmacy	√	√	√								√															
51	Drug Information	√	√	√										√													
52	Pharmacotherapy of Endocrine and Renal diseases	√	√	√																							
53	Pharmacotherapy of Oncological Diseases	√	√	√																							
54	Clinical pharmacokinetics	√	√	√								√															
55	Advanced Drug Delivery Systems																										
56	Pharmaceutical Technology																										
57	Public health and preventive medicine	√	√	√																							
58	Toxicology and forensic chemistry	√		√																							
59	Pharmacotherapy of Neuropsychiatric Diseases	√	√	√																							
60	Pharmacotherapy of Cardiovascular Diseases	√	√	√																							
61	Pharmacotherapy of Critical Care Patients	√	√	√																							
62	Clinical Research and Pharmacovigilance	√	√																								
63	Clinical Nutrition	√	√																								
64	Pharmaceutical Biotechnology	√	√	√																							
65	Pharmacotherapy of Dermatological and Musculoskeletal Diseases	√	√	√																							
66	Pharmacotherapy of Pediatric Diseases	√	√	√																							
67	Pharmacotherapy of Gastrointestinal Diseases	√	√	√																							

Course name		Program DOMAIN 2 (PROFESSIONAL AND ETHICAL PRACTICE)																			
		(2-1)			(2-2)				(2-3)			(2-4)				(2-5)			(2-6)		
		1	2	3	1	2	3	4	1	2	1	2	3	4	1	2	3	1	2		
68	Pharmacotherapy of Respiratory Diseases	✓	✓	✓																	
69	Phytotherapy	✓		✓										✓							
70	Marketing and Pharmacoeconomics																				
71	Entrepreneurship																				
Elective course																					
1	Drug Design				✓		✓			✓								✓			
2	Production and Manufacture of Medicinal Plants				✓		✓														
3	Good Manufacturing Practices				✓		✓														
4	Drug Manufacturing				✓		✓														
5	Biological Standardization				✓		✓			✓								✓	✓	✓	
6	Drug Interactions															✓					
7	Precision Pharmacy	✓	✓																		
8	Advanced Pharmaceutical Care	✓	✓	✓										✓				✓			
9	Recent Techniques of Structure Elucidation							✓													
10	Cosmetic Preparations	✓	✓		✓		✓														
11	Clinical Pharmaceuticals	✓		✓						✓						✓		✓			
12	Drug Targeting				✓		✓														

Course name		Program Domain 3 (Pharmaceutical Care)									
		(3-1)					(3-2)				
		1	2	3	4	1	2	3	4	5	6
1	Pharmaceutical Analytical Chemistry I										
2	Pharmaceutical Organic Chemistry I										
3	Pharmacy Orientation								√		√
4	Medicinal Plants										
5	Medical Terminology										
6	Information Technology										
7	Mathematics										
8	English Language*										
9	Pharmaceutical Analytical Chemistry II										
10	Pharmaceutical Organic Chemistry II										
11	Cell Biology	√			√						
12	Anatomy & Histology				√						
13	Physical Pharmacy										
14	Pharmacognosy I					√		√	√	√	√
15	Psychology*										
16	Social Issues *										
17	Pharmaceutical Organic chemistry-III										
18	Biochemistry-I	√			√						
19	Pharmacognosy -II					√		√	√	√	√
20	Basic Pharmacology	√				√	√				
21	Physiology and Pathophysiology	√			√						
22	Pharmaceutical Dosage forms- I										
23	Pharmacology -I	√			√	√	√			√	

Course name		Program Domain 3 (Pharmaceutical Care)											
		(3-1)						(3-2)					
		1	2	3	4	1	2	3	4	5	6		
24	General Microbiology and Immunology	✓		✓									
25	Communication Skills				✓	✓	✓	✓	✓	✓	✓		
26	Pathology	✓			✓								
27	Pharmaceutical dosage forms-II												
28	Biochemistry -II	✓			✓								
29	Pharmacy legislation and Ethics												
30	Parasitology	✓			✓								
31	Pharmacology -II	✓			✓	✓	✓			✓			
32	Pharmaceutical Microbiology												
33	Instrumental Analysis												
34	Medicinal chemistry-I												
35	Pharmaceutical dosage forms-III												
36	Phytochemistry-I					✓		✓					
37	First Aid and Basic Life Support (BLS)												
38	Pharmacology -III	✓			✓	✓				✓		✓	
39	Phytochemistry-II												
40	Medicinal chemistry-II												
41	Hospital Pharmacy	✓			✓	✓	✓			✓			
42	Medical Microbiology	✓		✓	✓								
43	Community Pharmacy	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	
44	Sterile Dosage Forms												
45	Scientific Writing												
46	Medicinal Chemistry-III												

Course name		Program Domain 3 (Pharmaceutical Care)									
		(3-1)					(3-2)				
		1	2	3	4	1	2	3	4	5	6
47	Quality Control of Pharmaceuticals										
48	Clinical Biochemistry	✓			✓						
49	Biopharmaceutics and pharmacokinetics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
50	Clinical Pharmacy	✓		✓	✓	✓	✓				
51	Drug Information					✓	✓	✓	✓	✓	✓
52	Pharmacotherapy of Endocrine and Renal diseases	✓			✓	✓	✓	✓		✓	✓
53	Pharmacotherapy of Oncological Diseases	✓			✓	✓	✓	✓		✓	✓
54	Clinical pharmacokinetics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
55	Advanced Drug Delivery Systems	✓									
56	Pharmaceutical Technology										
57	Public health and preventive medicine		✓							✓	✓
58	Toxicology and forensic chemistry					✓	✓		✓		✓
59	Pharmacotherapy of Neuropsychiatric Diseases	✓			✓	✓	✓	✓		✓	✓
60	Pharmacotherapy of Cardiovascular Diseases	✓			✓	✓	✓	✓		✓	✓
61	Pharmacotherapy of Critical Care Patients	✓			✓	✓	✓	✓		✓	✓
62	Clinical Research and Pharmacovigilance					✓	✓	✓	✓	✓	✓
63	Clinical Nutrition	✓			✓						
64	Pharmaceutical Biotechnology										
65	Pharmacotherapy of Dermatological and Musculoskeletal Diseases	✓			✓	✓	✓	✓		✓	✓
66	Pharmacotherapy of Pediatric Diseases	✓			✓	✓	✓	✓		✓	✓
67	Pharmacotherapy of Gastrointestinal Diseases	✓			✓	✓	✓	✓		✓	✓

Course name		Program Domain 3 (Pharmaceutical Care)											
		(3-1)						(3-2)					
		1	2	3	4	1	2	3	4	5	6		
68	Pharmacotherapy of Respiratory Diseases	✓			✓	✓	✓	✓		✓	✓		
69	Phytotherapy					✓	✓	✓	✓	✓	✓		
70	Marketing and Pharmacoeconomics												
71	Entrepreneurship												
Elective course													
1	Drug Design												
2	Production and Manufacture of Medicinal Plants									✓	✓		
3	Good Manufacturing Practices												
4	Drug Manufacturing												
5	Biological Standardization	✓			✓	✓							
6	Biological Standardization												
7	Drug Interactions	✓				✓	✓	✓		✓	✓		
8	Precision Pharmacy	✓	✓			✓	✓						
9	Advanced Pharmaceutical Care	✓	✓	✓		✓	✓	✓	✓	✓	✓		
10	Cosmetic Preparations					✓			✓	✓	✓		
11	Clinical Pharmaceutics	✓				✓			✓				
12	Drug Targeting	✓											

Course name		Program Domain 4 (Personal Practice)									
		(4-1)			(4-2)			(4-3)			
		1	2	3	1	2	3	1	2	3	4
1	Pharmaceutical Analytical Chemistry I	✓	✓	✓		✓					2
2	Pharmaceutical Organic Chemistry I	✓	✓								✓
3	Pharmacy Orientation		✓								
4	Medicinal Plants	✓	✓	✓	✓	✓					
5	Medical Terminology		✓		✓	✓					✓
6	Information Technology					✓					
7	Mathematics		✓								
8	English Language*				✓						
9	Pharmaceutical Analytical Chemistry II										
10	Pharmaceutical Organic Chemistry II	✓	✓								
11	Cell Biology		✓			✓					
12	Anatomy & Histology		✓								
13	Physical Pharmacy	✓	✓	✓							
14	Pharmacognosy I		✓	✓	✓	✓					
15	Psychology*	✓									
16	Social Issues *	✓									
17	Pharmaceutical Organic chemistry-III	✓	✓			✓					
18	Biochemistry-I	✓	✓			✓					
19	Pharmacognosy -II		✓	✓	✓	✓					
20	Basic Pharmacology					✓		✓			✓
21	Physiology and Pathophysiology	✓	✓					✓			✓
22	Pharmaceutical Dosage forms- I		✓		✓						
23	Pharmacology -I										
24	General Microbiology and Immunology	✓	✓			✓					✓

Course name	Program Domain 4 (Personal Practice)									
	(4-1)			(4-2)			(4-3)			
	1	2	3	1	2	3	1	2	3	
25	Communication Skills	✓								
26	Pathology	✓	✓	✓	✓					
27	Pharmaceutical dosage forms-II									
28	Biochemistry -II	✓	✓			✓				
29	Pharmacy legislation and Ethics	✓								
30	Parasitology	✓	✓							
31	Pharmacology -II							✓		✓
32	Pharmaceutical Microbiology	✓	✓							
33	Instrumental Analysis	✓	✓			✓	✓	✓		✓
34	Medicinal chemistry-I	✓	✓	✓						
35	Pharmaceutical dosage forms-III	✓	✓	✓						
36	Phytochemistry-I	✓	✓					✓		
37	First Aid and Basic Life Support (BLS)						✓	✓	✓	✓
38	Pharmacology -III								✓	✓
39	Phytochemistry-II	✓					✓		✓	
40	Medicinal chemistry-II	✓	✓				✓			
41	Hospital Pharmacy	✓	✓							
42	Medical Microbiology	✓	✓							
43	Community Pharmacy	✓	✓				✓	✓	✓	✓
44	Sterile Dosage Forms	✓	✓							
45	Scientific Writing	✓	✓				✓		✓	
46	Medicinal Chemistry-III	✓	✓	✓						
47	Quality Control of Pharmaceuticals									
48	Clinical Biochemistry	✓	✓						✓	✓

Course name		Program Domain 4 (Personal Practice)										
		(4-1)			(4-2)			(4-3)				
		1	2	3	1	2	3	1	2	3		
49	Biopharmaceutics and pharmacokinetics	✓	✓	✓			✓	✓	✓		✓	2
50	Clinical Pharmacy											✓
51	Drug Information	✓	✓	✓			✓	✓	✓		✓	✓
52	Pharmacotherapy of Endocrine and Renal diseases	✓	✓					✓	✓			
53	Pharmacotherapy of Oncological Diseases	✓	✓					✓	✓			
54	Clinical pharmacokinetics	✓	✓	✓		✓		✓	✓		✓	✓
55	Advanced Drug Delivery Systems	✓	✓									
56	Pharmaceutical Technology	✓	✓	✓		✓			✓		✓	✓
57	Public health and preventive medicine	✓	✓								✓	✓
58	Toxicology and forensic chemistry		✓								✓	✓
59	Pharmacotherapy of Neuropsychiatric Diseases	✓	✓				✓		✓			
60	Pharmacotherapy of Cardiovascular Diseases	✓	✓				✓		✓			
61	Pharmacotherapy of Critical Care Patients	✓	✓				✓		✓			
62	Clinical Research and Pharmacovigilance	✓	✓	✓		✓		✓	✓		✓	✓
63	Clinical Nutrition	✓	✓						✓		✓	✓
64	Pharmaceutical Biotechnology	✓	✓	✓		✓						
65	Pharmacotherapy of Dermatological and Musculoskeletal Diseases	✓	✓				✓		✓			
66	Pharmacotherapy of Pediatric Diseases	✓	✓				✓		✓			
67	Pharmacotherapy of Gastrointestinal Diseases	✓	✓				✓		✓			
68	Pharmacotherapy of Respiratory Diseases	✓	✓				✓		✓			
69	Phytotherapy	✓	✓				✓		✓		✓	✓
70	Marketing and Pharmacoeconomics	✓										
71	Entrepreneurship	✓	✓	✓		✓		✓			✓	✓

Course name		Program Domain 4 (Personal Practice)									
		(4-1)			(4-1)			(4-1)			
		1	2	3	1	2	3	1	2	3	
Elective course											
1	Drug Design	✓	✓								
2	Production and Manufacture of Medicinal Plants	✓	✓			✓	✓			✓	
3	Good Manufacturing Practices	✓	✓			✓			✓		✓
4	Drug Manufacturing	✓	✓			✓			✓		✓
5	Biological Standardization										
6	Biological Standardization								✓		✓
7	Drug Interactions		✓								
8	Precision Pharmacy	✓	✓					✓		✓	✓
9	Advanced Pharmaceutical Care	✓	✓			✓		✓	✓	✓	✓
10	Cosmetic Preparations					✓		✓	✓		
11	Clinical Pharmaceuticals		✓					✓	✓		
12	Drug Targeting	✓						✓	✓	✓	