

***Faculty of Pharmacy
Alexandria University***

Program Specification 2014/2015

***Bachelor of Pharmacy
(Clinical Pharmacy)***

A- Basic Information

1- Programme title: Bachelor in Pharmacy (Clinical Pharmacy)

2- Programme type: Single ☒ Double ☐ Multiple ☐

3- Department(s): Seven Departments:

- Pharmaceutics.
- Industrial Pharmacy.
- Pharmaceutical Chemistry.
- Pharmaceutical Analytical Chemistry.
- Pharmacognosy.
- Pharmaceutical Microbiology.
- Pharmacology.

4- Coordinator: Heba Hassan Abdin, Professor of Pharmaceutical Analytical Chemistry.

5- External evaluator: Hoda Daabees, Professor of Pharmaceutical Chemistry.

6- Last date of program specifications approval by Faculty Council:

معتمد من مجلس الكلية الخامس في العام الجامعي 2014/2015 والمنعقد يوم الاربعاء الموافق
2014/12/16

B- Professional Information

1- Program aims

- Provide community with specialist pharmacists at a high level of scientific competence and ethical values being able to cooperate with the medical team in the development and follow up treatment protocols in various medical specialties.
- Graduate qualified pharmacists to work in the fields of manufacturing and marketing pharmaceuticals, drug quality control and analysis of the food as well as working as community and retail pharmacists.
- Encourage participation in multidiscipline research projects and cooperation with various research and clinical centers locally, regionally and internationally.
- Apply modern systems of education and self-learning.
- Develop of self-financing resources of the Faculty of Pharmacy.

2- Graduate attributes

Pharmacy graduates working in the multidisciplinary professions, consequently, they must acquire the necessary specifications and characteristics in various aspects of the pharmacy to keep track of their future career. In addition, they must demonstrate thorough knowledge and understanding of a clear and distinguish skills as follows:

1. Deal with chemicals, natural and pharmaceutical products effectively and safely in accordance with legislation and relevant laws.
2. Be able to compound, prepare pharmaceutical products and participate in the systems of dispensing, storage and distribution of medicines.
3. Perform qualitative and quantitative analytical techniques and achieve the standards of good manufacturing practices (GMP), and good laboratory practices (GLP), so as to ensure the quality of raw materials and pharmaceutical products and processes.
4. Demonstrate principles of understanding of etiology, pathophysiology of disease and participate with other health care professionals in the field of development of pharmaceutical health care services through the use of data based on scientific and practical evidence.
5. Develop skills of presentation, promotion, marketing, business management and computer.
6. Demonstrate good communication, time management, critical thinking, problem solving and decision-making skills, in addition to the ability of working in an integrated medical team.
7. Perform of pharmacy practices in consistent with the rules of law, ethics and profession and show credibility.

8. Be committed to lifelong learning, continuous improvement of skills and professional knowledge.
9. Educate patients and community about proper and safe use of medications, medical devices and risks of drugs abuse radiations and xenobiotics.
10. Plan, design and conduct research.
11. Develop numerical and statistical skills.

3- Intended learning outcomes (ILOs)

A. Knowledge & understanding:

Students after completing the program should have acquired knowledge & understanding of:

- A1 Key aspects of basic, pharmaceutical, pharmacognostical, medical, social, behavioral, management, health and environmental sciences as well as pharmacy practice.
- A2 Physico-chemical properties of active and inactive ingredients of medicinal products including biotechnology and radio-labeled pharmaceuticals.
- A3 Principles of analytical methods for drugs in bulk, in dosage forms and in biological fluids, using good laboratory practice guidelines and validation methods.
- A4 Principles and applications of pharmaceutical and phyto-chemistry in synthesis, isolation, purification, identification and standardization of pharmaceutical compounds.
- A5 Principles and concepts of structure-based drug design and molecular modeling.
- A6 Dosage forms including novel drug delivery systems, formulation, characterization, stability and performance.
- A7 Principles of pharmaceutical industry operations covering manufacture, packaging, labeling, storage and distribution.
- A8 Principles and applications of biopharmaceutics and basic pharmacokinetics in optimizing of formulation, in therapeutic drug monitoring and in bioequivalence studies.
- A9 Principles of hospital pharmacy, covering pharmacy department services including drug distribution system, IV admixtures, and total parenteral nutrition.
- A10 Public health issues including health promotion, disease prevention and safe disposal of waste related to manufacture and use of medicines.
- A11 Principles of histology, biochemistry, physiology and pathology applied to drug disposition in different disease states.
- A12 Etiology, epidemiology, laboratory diagnosis and clinical features of different diseases and their pharmacotherapeutic Approaches.

- A13 Pharmacological properties of drugs including therapeutic uses, mechanism of action, dosage, adverse reactions, contraindications and drug interactions.
- A14 Pharmacotherapeutic principles applied to the treatment of different diseases, pharmacovigilance and rational use of drugs.
- A15 Basis of complementary and alternative medicine with emphasis on herbal remedies, nutritional supplements, homeopathies and their effect on maintaining optimum health and preventing chronic diseases.
- A16 Toxicity of drugs and other xenobiotics including identification, symptoms, management, treatment and first aid measures.
- A17 Pharmaceutical calculations and methods of biostatistical analysis.
- A18 Principles of pharmaceutical management including financial and human resources.
- A19 Principles of drug promotion, sales and marketing, business administration accounting and pharmaconomisc.
- A20 Pharmacy laws, regulatory affairs, and ethics of pharmacy profession and health care.
- A21 Quality assurance of pharmaceutical processes, pharmaceutical and herbal products including physical, chemical and microbiological quality control.
- A22 Concept of pharmaceutical care and clinical rounding as applied to different pharmacy practice settings.
- A23 Principles and applications of pharmaceutical microbiology in control of microbial contamination and sterilization methods.
- A24 Stability of medicines; evaluation and control of biological, physical and chemical degradation.
- A25 Principles of drug development through pharmaceutical biotechnology, antisense drugs and gene therapy.
- A26 Principles of veterinary biological and pharmaceutical preparations with a brief review of animal infectious diseases and parasites.
- A27 Principles of diagnosis and patient counseling for different disease states including dermatological, reproductive, pediatrics, cardiovascular, gastrointestinal, and respiratory system diseases.
- A28 The use of drug information resources and internet to manage different cases including poisoning and drug interaction.
- A29 Principles of proper documentation and drug filing systems.

B. Intellectual skills:

Students after completing the program should be able to:

- B1 Develop a suitable formulation for a drug on a scientific basis, and design novel drug delivery systems to improve drug safety and performance.

- B2 Appreciate the principles governing application of good laboratory practice, good clinical practice good manufacturing practice, and good storage practice.
- B3 Apply and develop quality control tests for different natural and synthetic pharmaceutical compounds as well as for different dosage forms.
- B4 Revise prescriptions before compounding or dispensing them to detect prescription-related problems such as incompatibilities or other interactions.
- B5 Apply appropriate methods to isolate, purify, identify, synthesize, and standardize active principles from different origins using relevant pharmaceutical knowledge.
- B6 Identify potential drugs through computer-aided drug design (CADD) and predict their biological activity.
- B7 Address specific pharmacy practice requirements in handling biopharmaceutical products based on principles of biotechnology and protein delivery.
- B8 Select suitable method of infection control, and apply knowledge of microbial and parasitic diseases for promotion of community health.
- B9 Use principles and knowledge of pharmacology in choice of medicinal products to suit different diseases in human and animals.
- B10 Use pharmacokinetic principles in therapeutic drug monitoring adjusting drug doses & regimen.
- B11 Address drug-related problems such as drug interactions and adverse drug reactions as essential issues in implementing pharmaceutical care.
- B12 Apply pharmacoeconomic principles in addressing cost/effective drug therapy.
- B13 Apply relevant pharmaceutical and analytical principles in generating, presenting, analyzing and interpreting experimental data.
- B14 Comprehend, analyze, and criticize published evidence-based information of relevance to pharmacy practice.
- B15 Apply relevant pharmaceutical knowledge in identifying official medicinal plants microscopically and macroscopically, and in analyzing herbal drugs to determine possible adulteration, and to control their quality.
- B16 Recognize social health hazards of natural or synthetic drug abuse, misuse and toxic agents.
- B17 Distinguish minor illness from those which require referral, and respond appropriately to presented symptoms.

C. Professional and practical skills:

Students after completing the program should be able to:

- C1 Use pharmaceutical and medical terms and abbreviations correctly in different professional settings.
- C2 Handle, and dispose of, chemicals in a manner ensuring safety of individuals and environment.

- C3 Appropriately compound, dispense, store and distribute medicines in a manner sustaining their quality.
- C4 Carry out synthesis, extraction, isolation, purification and standardization of active substances according to good laboratory and manufacturing practices.
- C5 Practice good judgment in selecting appropriate medicines according to good clinical practice.
- C6 Manage and control microbial contamination and growth, and handle laboratory identification tests for different diseases.
- C7 Identify symptoms of drug poisoning, and identify and isolate poisons in biological samples.
- C8 Handle equipment required in various pharmaceutical operations.
- C9 Promote public awareness of health hazards of natural and synthetic drug abuse and misuse.
- C10 Effectively practice patient counseling when dispensing OTC and prescription products to ensure safe and proper use of medicines.
- C11 Generate, present, analyze and interpret experimental data in a professional manner and adopt suitable documentation and filing system.
- C12 Contribute to problem solving in pharmaceutical manufacturing sites.
- C13 Plan, evaluate and participate in clinical rotations and trials.

D. Transferable or general skills:

Students after completing the program should be able to:

- D1 Effectively communicate drug-related information to health care professionals and express medical issues in lay language to the public.
- D2 Retrieve up-to-date drug information from a variety of sources.
- D3 Work effectively as individuals and within a team.
- D4 Use information technology tools and apply mathematical and statistical methods when needed.
- D5 Continue professional development through self learning.
- D6 Follow ethical, legal and safety guidelines in all practice settings.
- D7 Further develop skills of market management.
- D8 Manage time effectively.
- D9 Demonstrate writing and presentation skills when needed.
- D10 Further develop problem solving skills including decision making and critical thinking.

Intended learning outcomes of hospital training program:

A- Knowledge and understanding:

1. Review the roles, activities and standards of practice of a clinical pharmacist.
2. Understand organization and structure of hospital pharmacy department and personnel.
3. Understand pharmacist administrative and technical roles in the hospital.
4. Be knowledgeable about specific hospital pharmaceutical services either patient care services or medication-based services such as handling of radiopharmaceuticals (if present), plasma substitutes and IV admixtures and supply of drug to hospital inpatients and outpatients.
5. Understand and identify how to utilize the multidisciplinary means necessary to provide optimum care for hospitalized patients
6. Familiarize him/herself with the legal requirements for dispensing outpatient or discharge prescriptions and orders for scheduled drugs on a medication chart (prescription reviewing)
7. Familiarize him/herself with commonly used drug committee policies e.g. antibiotic policies and formulary management
8. Familiarize him/herself with medical terminology and hospital approved list of abbreviations used in prescription writing and medical notes
9. Familiarize him/herself with the accountability in managing therapy, education, counseling, and consultation roles and explain drug therapy problems that may arise from the above analysis
10. Familiarize him/herself with the Standards of Practice for Drug Information Services:
 - In-house pharmacy guidelines on answering drug information enquiries
 - Electronic drug information retrieval databases
 - Use EBM principles
11. Familiarize him/herself with Adverse drug reactions (ADR) and the way of their reporting
12. Be familiar with medication-related information
13. Be familiar with the general outlines and concepts of compounding quality assurance, sterile compounding facilities and equipment, sterile injectable record keeping, and labeling

B. Intellectual skills:

1. Analyze patient's medication and conduct comprehensive medication review
2. Observe and critically evaluate medical information and scientific evidence relevant to patient care

3. Assess clinical information including relevant laboratory and other monitoring data that is critical to medication review and determine their implications for medication regimens.
4. Identify and resolve medication therapy problems, manage drug interactions, and resolve gaps in care
5. Critically analyze drug information using EBM approach to manage the pharmaceutical care of patients.
6. Acquire diagnostic reasoning skills as a means to solve drug-related problems
7. Predict possible incompatibilities in IV admixtures.

C. Professional and practical skills:

1. Apply pharmaceutical care concepts in different clinical settings.
2. Solve medication-related problems encountered throughout care planning & implementation.
3. Create a comprehensive clinical management plan and evaluate treatment strategies
4. Conduct patient interviews using appropriate questioning to ascertain their medication and adverse drug reaction history, relevant background and patient understanding of treatment, other medication management issues and provide education.
5. Use evidence-based, cost-conscious strategies in the care of hospitalized patients and Exercise using electronic data bases, literature retrieval services and computer-based diagnostic reasoning and drug information programs, if available
6. Document services and follow-up with other health professionals
7. Behave professionally towards patients, colleagues, and all members of the health care team
8. Utilize hospital database on laboratory investigations and monitor changes in patient's status
9. Handling of IV admixtures, radiopharmaceuticals (if present), blood products, surgical dressings, TPN/EN, cytotoxic products and sutures in aseptic techniques.
10. Participate in medication control, administration, monitoring in the hospital and management of central sterile supply unit.

D. General and transferable skills:

1. Use appropriate communication skills to communicate effectively with individual and small groups of patients, colleagues, senior clinicians and managers as well as effectively with all non-physician members of the health care team to assure comprehensive and timely care of hospitalized patients

2. Efficiently utilize library and information technology facilities to search and retrieve information in specified areas relevant to course content.
3. Engage in continuous self learning.
4. Present patient information concisely and clearly, verbally and written

Intended learning outcomes of pharmacy training program:

A. Knowledge and understanding:

Student should acquire the following skills form the summer training program:

1. Acquainted different drug groups and representative examples.
2. Appropriate different drug substitutes.
3. Food supplements and herbal drugs.
4. Medical appliances (syringes, canulas, bandages,) and its proper handling.
5. Pharmacy Practice including:
 - Pharmacy Management.
 - Prescription reading, revision and dispensing.
 - Patient Counseling.
 - Pharmaceutical Compounding.
 - Ordering medicines from pharmaceutical companies and drugs stores.
 - Arranging medicines in their proper places in the pharmacy.
 - Follow up the stock of each medicine concerning stage conditions and expiry dates.
6. Drug and food interactions and medication errors.
7. General Knowledge about public health including:
 - Health care.
 - Prevention of diseases.
 - Safe use of medicines.
 - Vaccines.
 - Contraception devices & medicine.

B. Intellectual skills:

1. The ability to calculate medicine doses and dosage regimens.
2. Selection of the appropriate substitutes for non available drugs.
3. Solve problems specially related to drug – drug interactions.

C. Professional and practical skills:

After completing the training, the student should acquire the following skills:

1. Prescription reading and dispensing.
2. Patient Counseling.
3. OTC prescribing.
4. Covering drug information.
5. Giving advices about the correct use of medicines and drug – drug interactions.
6. Safely handling pharmaceutical materials.
7. Dealing with simple cases of first aid.

D. Transferable skills:

1. Having good communication skills with the pharmacy team, patients and other health care professionals.
2. Team work capability.
3. The ability to understand and use medical and pharmaceutical terminology.

ILOs - معتمدة و تم مراجعتها في مجلس الكلية الخامس للعام الجامعي 2014/2015 يوم الاربعاء الموافق
2014/12/16

4- Academic standards

4a. External references standards:

The academic standards for the clinical program have been referred to The National Academic Reference Standards in Egypt (NARS, 2009) which includes the minimum knowledge and skills to be gained by the graduates.

4b. Comparison of faculty program academic characteristics with the adopted external reference standards:

The Clinical Pharmacy Program fulfills most of NARS 2009 requirements concerning Intended learning outcomes, graduate attributes and suggested courses.

Table (1): Comparison between NARS and the Clinical Pharmacy Program graduate attributes:

NARS (2009)	Clinical Pharmacy Program
1.1	1
1.2	2
1.3	3
1.4	9
1.5	4
1.6	10, 11
1.7	5
1.8	6
1.9	7
1.10	8

Table (2): Comparison between NARS and the Clinical Pharmacy Program ILOs:

Knowledge & understanding

NARS (2009)	Clinical Pharmacy Program
2.1	A1
2.2	A2
2.3	A3
2.4	A4
2.5	A5
2.6	A6
2.7	A7
2.8	A8
2.9	A9
2.10	A10, A23
2.11	A11
2.12	A12
2.13	A13
2.14	A14
2.15	A15
2.16	A16
2.17	A17
2.18	A18
2.19	A19
2.20	A29
2.21	A20
-	A21
-	A22
-	A24
-	A25
-	A26
-	A27
-	A28
-	A29

Remarks on clinical pharmacy program ILOs (A21 - A28)

A21 reads: "Quality assurance of pharmaceutical processes, pharmaceutical and herbal products including physical, chemical and microbiological quality control".

Several courses in different departments contribute to this area of knowledge namely; Quality Control of Herbal Drugs (PG 606), Pharmaceutical Microbiology (PM 704), Pharmaceutical Analysis and Quality Control (PC 808), Chromatography and Separation Techniques (PG E10) and Quality Assurances and GMP (PT E 10).

A22 reads: "Concept of pharmaceutical care and clinical rounding as applied to different pharmacy practice settings"

This area of knowledge is covered in Community Pharmacy Practice (PT 608), Clinical Pharmacy-1 (PP 702), Hospital Pharmacy (PP 703), Clinical pharmacy-2 (PP 805) and Summer Training.

A23 reads: "Principles and applications of pharmaceutical microbiology in control of microbial contamination and sterilization methods".

The following courses cover this area of knowledge & understanding: General Microbiology and Immunology (PM 401), Clinical Microbiology (PM 502), Pharmaceutical Microbiology (PM 704) and Antimicrobial Agents (PM E6).

A24 reads: "Stability of medicines; evaluation and control of biological, physical and chemical degradation".

Pharmaceutical Analysis and Quality Control (PC 808) and Biological Standardization (PM E5) courses cover this area of knowledge.

A25 reads: "Principles of drug development through pharmaceutical biotechnology, antisense drugs and gene therapy"

This knowledge is covered in Medicinal Chemistry-1 (PC 509), Pharmaceutical Biotechnology (PM 703) and Good Manufacturing practices (PT E12) courses.

A26 reads: "Principles of veterinary biological and pharmaceutical preparations with a brief review of animal infectious diseases and parasites".

This knowledge area is covered in Parasitology (MD 406) and Veterinary Pharmacology (POE 9) courses.

A27 reads: "Principles of diagnosis and patient counseling for different disease states including dermatological, reproductive, pediatrics, cardiovascular, gastrointestinal, and respiratory system diseases".

Several courses contribute to this area of knowledge namely; Therapeutics-1 (PO 905). Oncology (PP 908). Therapeutics-2 (PO 007), Treatment of Dermatological & Reproductive Diseases (PP 010), Treatment of Pediatric Diseases (PP 011), Treatment of Cardiovascular Diseases (PP 012). Gastroenterology (PP 013), Treatment of Respiratory System Diseases (PP 014) and Cosmetic Preparations (PT E13), in addition to the Summer Training.

A28 reads: “The use of drug information resources and internet to manage different cases including poisoning and drug interactions”.

Several courses contribute to this area of knowledge namely; Computer Science (CS 101), Drug Interactions (PO 803), Therapeutics-1 (PO 905) Toxicology and Forensic Chemistry (PO 904), Therapeutics-2 (PO 007) and Drug Information (PP 015). Moreover, this area of knowledge is covered in Summer Training.

Intellectual skills

NARS (2009)	Clinical Pharmacy Program
4.1	B1
4.2	B2
4.3	B3
4.4	B4
4.5	B5
4.6	B6
4.7	B7
4.8	B8
4.9	B9
4.10	B10
4.11	B11
4.12	B12
4.13	B13
4.14	B14
-	B15
-	B16
-	B17

Remarks on clinical pharmacy program ILOs (B15 - B17)

B15 reads: “Apply relevant pharmaceutical knowledge in identifying official medicinal plants microscopically and macroscopically and in analyzing herbal drugs to determine possible adulteration and to control their quality”.

Courses taught by the pharmacognosy department contribute to this skill; namely, Botany and Medicinal Plants (PG 101), Pharmacognosy-1 (PG 202), Pharmacognosy-2 (PG 303), Quality Control of Herbal Drugs (PG 606), Phytotherapy (PG 807), Alternative Medicinal Therapies (PG E 8) and Production and Manufacture of Medicinal Plants (PG E 9).

B16 reads: “Recognize social health hazards of natural or synthetic drug abuse, misuse and toxic agents”. Three courses contribute to this skill; namely, TROMAS and First Aid

(MD 609), Pharmaceutical Microbiology (PM 704) and Toxicology and Forensic Chemistry (PO 904), in addition to the Summer Training.

B17 reads: “Distinguish minor illness from those which require referral, and respond appropriately to presented symptoms”.

Several courses in different departments contribute to this skill; namely, Clinical Microbiology (PM 502) , Pathology (MD 608), Clinical Pharmacy-1 (PP 702), Clinical Pharmacy-2 (PP 805), Oncology (PP 908), Clinical Nutrition (PP 909), Treatment of Dermatological and Reproductive Diseases (PP 010), Treatment of Pediatric Diseases (PP 011), Treatment Cardiovascular Diseases (PP 012), Gastroenterology (PP 013) and Treatment of Respiratory System Diseases (PP 014) , in addition to the Summer Training.

Professional and practical skills

NARS (2009)	Clinical Pharmacy Program
3.1	C1
3.2	C2
3.3	C3
3.4	C4
3.5	C5
3.6	C6
3.7	C7
3.8	C8
3.9	C9
3.10	C10
3.11, 3.12	C11
-	C12
-	C13

Remarks an clinical pharmacy program ILOs (C12 and C13)

C12 reads: “Contribute to problem solving in pharmaceutical manufacturing sites”.

Five courses indicate that the students are acquiring this skill; namely, Physical Pharmacy (PT 201), Pharmaceutical Technology (PT 607), Pharmaceutical Biotechnology (PM 703), Applied Industrial Pharmacy (PT E11) and Good Manufacturing Practices (PT E12).

C13 reads: “Plan, evaluate and participate in clinical rotations and trials”.

Many courses contribute to this skill namely, Community Pharmacy Practice (PT 608), Drug Interactions (PO 803), Clinical Pharmacokinetics (PP 907), Oncology (PP 908), Clinical Nutrition (PP 909), Clinical Pharmacology (PO 906), Treatment of Dermatological Reproductive Diseases (PP 010), Treatment of Pediatrics Diseases (PP 011), Treatment of Cardiovascular Diseases (PP 012), Gastroenterology (PP 013) and

Treatment of Respiratory System Diseases (PP 014), in addition to the Summer Training.

Transferable and general skills

NARS (2009)	Clinical Pharmacy Program
5.1	D1
5.2	D2
5.3	D3
5.4	D4
5.5	D5
5.6	D6
5.7	D7
5.8	D8
5.9	D9
5.10	D10

5- Curriculum structure No. of semesters:

5 years (10 Semesters):

First year:

1 st semester:	Lectures	13	Lab./Exercise	6	Total	19
2 nd semester:	Lectures	14	Lab./Exercise	5	Total	19

Second year:

1 st semester:	Lectures	14	Lab./Exercise	5	Total	19
2 nd semester:	Lectures	12	Lab./Exercise	6	Total	18

Third year:

1 st semester:	Lectures	14	Lab./Exercise	5	Total	19
2 nd semester:	Lectures	14	Lab./Exercise	6	Total	20

Fourth year:

1 st semester:	Lectures	15	Lab./Exercise	5	Total	20
2 nd semester:	Lectures	15	Lab./Exercise	6	Total	21

Fifth year:

1 st semester:	Lectures	14	Lab./Exercise	7	Total	21
2 nd semester:	Lectures	14	Lab./Exercise	7	Total	21

Summer Training:

At least 100 credit hours in some Pharmaceutical Organizations.

At least 100 credit hours in hospitals.

Table (3): Comparison between NARS and the Clinical Pharmacy Program curriculum structure:

Sciences	Courses	Credit hours	Total hours	Percentage (NARS%)
Basic	Physical and Inorganic Chemistry	3	31	15.74% (10-15%)
	Pharmaceutical Organic Chemistry-1	3		
	Biophysics	2		
	Botany and Medicinal Plants	3		
	Cell Biology	2		
	Mathematics and Statistics	2		
	Pharmaceutical Organic Chemistry-2	3		
	Pharmaceutical Analytical Chemistry-1	3		
	Pharmaceutical Organic Chemistry-3	3		
	Pharmaceutical Analytical Chemistry-2	3		
	English Language	2		
	Computer Science	2		
Pharmaceutical	Pharmacognosy-1	3	54	27.41% (35-40%)
	Physical Pharmacy	3		
	Pharmacy Orientation	2		
	Pharmacognosy-2	3		
	Medical Terminology	2		
	Phytochemistry-1	3		
	Instrumental Analysis	2		
	Pharmaceutical Dosage Forms-1	3		
	Medicinal Chemistry-1	3		
	Pharmaceutical Dosage Forms-2	3		
	Phytochemistry-2	3		
	Medicinal Chemistry-2	3		
	Pharmaceutical Technology	3		
	Biopharmaceutics and Pharmacokinetics	3		
	Quality Control of Herbal Drugs	3		
	Radiopharmaceuticals	1		
	Controlled Drug Delivery Systems	2		
	Pharmaceutical Biotechnology	3		
	Pharmaceutical Microbiology	3		
	Pharmaceutical Analysis and Quality Control	3		
Medical	Histology	3	49	24.87% (20-25%)
	Anatomy	2		
	Physiology	4		
	Biochemistry-1	3		
	General Microbiology and Immunology	4		

	Parasitology	2		
	Clinical Microbiology	3		
	Biochemistry-2	3		
	Pathophysiology	2		
	Pathology	3		
	Pharmacology-1	3		
	Pharmacology-2	3		
	Clinical Biochemistry	3		
	Therapeutics-1	3		
	Clinical Nutrition	2		
	Clinical Pharmacology	3		
	Therapeutics-2	3		
Pharmacy Practice	Pharmacy Legislation	1	39	19.79%
	Community Pharmacy Practice	3		(10-15%)
	Clinical Pharmacy-1	3		
	Hospital Pharmacy	3		
	Clinical Pharmacy-2	3		
	Phytotherapy	3		
	Drug Interactions	2		
	Clinical Pharmacokinetics	3		
	Oncology	3		
	Treatment of Cardiovascular Diseases	3		
	Treatment of Dermatological and Reproductive Diseases	2		
	Treatment of Pediatric Diseases	3		
	Gastroenterology	3		
	Treatment of Respiratory System Diseases	3		
	Drug Information	1		
Health & Environmental	Tromas and First Aid	2	7	3.55%
	Public Health and Preventive Medicine	2		(5-10%)
	Toxicology and Forensic Medicine	3		
Behavioral and Social	Sociology	1	5	2.54%
	Psychology	2		(2-4%)
	Human Rights	2		
Pharmacy Management	Pharmacy Administration	2	3	1.52%
	Drug Marketing	1		(2-4%)
Discretionary	3 Elective courses	9	9	4.57% (up to 8%)

6- Program courses

Semester (1)

Course Title	Course code	Credit hours			Prerequisite
		Lect.	Pract.	Total	
Physical and Inorganic Chemistry-1	PC 101	2	1	3	Registration
Pharmaceutical Organic Chemistry-1	PC 102	2	1	3	Registration
Biophysics	MD 101	1	1	2	Registration
Botany and Medicinal Plants	PG 101	2	1	3	Registration
Cell Biology	MD 102	1	1	2	Registration
Mathematics and Statistics	MS 101	2	-	2	Registration
Computer Science	CS 101	1	1	2	Registration
English Language	EN 101	2	-	2	Registration
Total		13	6	19	

Semester (2)

Course Title	Course code	Credit hours			Prerequisite
		Lect.	Pract.	Total	
Pharmaceutical Organic Chemistry-2	PC 203	2	1	3	PC 102
Pharmaceutical Analytical Chemistry-1	PC 205	2	1	3	Registration
Pharmacognosy-1	PG 202	2	1	3	PG 101
Histology	MD 203	2	1	3	Registration
Physical Pharmacy	PT 201	2	1	3	Registration
Pharmacy Orientation	PT 202	2	-	2	Registration
Human Rights	HU 201	2	-	2	Registration
Total		14	5	19	

Semester (3)

Course Title	Course code	Credit hours			Prerequisite
		Lect.	Pract.	Total	
Pharmaceutical Organic Chemistry-3	PC 304	2	1	3	PC 102
Pharmaceutical Analytical Chemistry-2	PC 306	2	1	3	PC 205
Pharmacognosy-2	PG 303	2	1	3	PG 101
Anatomy	MD 304	1	1	2	Registration
Physiology	MD 305	3	1	4	Registration
Medical Terminology	EN 302	2	-	2	Registration
Psychology	HU 302	2	-	2	Registration
Total		14	5	19	

Semester (4)

Course Title	Course code	Credit hours			Prerequisite
		Lect.	Pract.	Total	
Biochemistry-1	PB 401	2	1	3	Registration
Phytochemistry-1	PG 404	2	1	3	PG 202
Instrumental Analysis	PC 407	1	1	2	Registration
General Microbiology and Immunology	PM 401	3	1	4	Registration
Parasitology	MD 406	1	1	2	Registration
Pharmaceutical Dosage Forms-1	PT 403	2	1	3	PT 201
Pharmacy legislation	PT 404	1	-	1	Registration
Total		12	6	18	

Semester (5)

Course Title	Course code	Credit hours			Prerequisite
		Lect.	Pract.	Total	
Pharmacology-1	PO 701	2	1	3	MD 305
Pharmaceutical Microbiology	PM 704	2	1	3	Registration
Pharmaceutical Dosage Forms-2	PT 505	2	1	3	PT 201
Biochemistry-2	PB 502	2	1	3	PB 401
Phytochemistry-2	PG 505	2	1	3	PG 202
Pathophysiology	MD 507	2	-	2	MD 305
Pharmacy Administration	PT 506	2	-	2	Registration
Total		14	5	19	

Semester (6)

Course Title	Course code	Credit hours			Prerequisite
		Lect.	Pract.	Total	
Medicinal Chemistry-1	PC 509	2	1	3	PC 203
Pharmaceutical Technology	PT 607	2	1	3	Registration
Community Pharmacy Practice	PT 608	2	1	3	Registration
Biopharmaceutics and Pharmacokinetics	PT 609	2	1	3	PT 505
Quality Control of Herbal Drugs	PG 606	2	1	3	PG 202
Clinical Microbiology	PM 502	2	1	3	PM 401
Tromas and First Aid	MD 609	2	-	2	Registration
Total		14	6	20	

Semester (7)

Course Title	Course code	Credit hours			Prerequisite
		Lect.	Pract.	Total	
Pharmacology-2	PO 802	2	1	3	PO 701
Radiopharmaceuticals	PP 701	1	-	1	Registration
Clinical Pharmacy-1	PP 702	2	1	3	Registration
Hospital Pharmacy	PP 703	2	1	3	Registration
Controlled Drug Delivery Systems	PT 704	2	-	2	PT 505
Public Health and Preventive Medicine	MD 710	2	-	2	PM 502
Pharmaceutical Biotechnology	PM 703	2	1	3	Registration
Pathology	MD 608	2	1	3	Registration
Total		15	5	20	

Semester (8)

Course Title	Course code	Credit hours			Prerequisite
		Lect.	Pract.	Total	
Medicinal Chemistry-2	PC 610	2	1	3	PC 203
Clinical Pharmacy-2	PP 805	2	1	3	PP 702
Phytotherapy	PG 807	2	1	3	PG 202
Pharmaceutical Analysis and Quality Control	PC 808	2	1	3	PC 306
Clinical Biochemistry	PB 803	2	1	3	PB 502
Drug Marketing	PB 806	1	-	1	Registration
Drug Interactions	PO 803	2	-	2	PO 701
Elective Course	PE	2	1	3	Registration
Total		15	6	21	

Semester (9)

Course Title	Course code	Credit hours			Prerequisite
		Lect.	Pract.	Total	
Toxicology and Forensic Chemistry	PO 904	2	1	3	PO 802
Therapeutics-1	PO 905	2	1	3	PO 802
Clinical Pharmacokinetics	PP 907	2	1	3	PT 609
Oncology	PP 908	2	1	3	MD 608, PO 802
Clinical Nutrition	PP 909	1	1	2	PB 502
Clinical Pharmacology	PO 906	2	2	3	PO 802
Sociology	HU 903	1	-	1	Registration
Elective Course	PE	2	1	3	Registration
Total		14	7	21	

Semester (10)

Course Title	Course code	Credit hours			Prerequisite
		Lect	Pract.	Total	
Therapeutics -2	PO 007	2	1	3	PO 802
Treatment of Dermatological and Reproductive Diseases	PP 010	1	1	2	MD 608, PO 802
Treatment of Pediatrics Diseases	PP 011	2	1	3	MD 608, PO 802
Treatment of Cardiovascular Diseases	PP 012	2	1	3	MD 608, PO 802
Gastroenterology	PP 013	2	1	3	MD 608, PO 802
Treatment of Respiratory System Diseases	PP 014	2	1	3	MD 608, PO 802
Drug Information	PP 015	1	-	1	PO 802, PP 805
Elective Course	PE	2	1	3	Registration
Total		14	7	21	

Elective Courses:

Courses code	Courses title	Credit hours		
		L	P	Total
PC E11	Drug Design	2	1	3
PC E12	Advanced Pharmaceutical Analysis- Spectroscopy	2	1	3
PO E9	Veterinary Pharmacology	2	1	3
PM E5	Biological Standardization	2	1	3
PM E6	Antimicrobial Agents	2	1	3
PG E8	Alternative Medicinal Therapies	2	1	3
PG E9	Production and Manufacture of Medicinal Plants	2	1	3
PG E10	Chromatography and Separation Techniques	2	1	3
PT E10	Quality Assurances and GMP	2	1	3
PT E11	Applied Industrial Pharmacy	2	1	3
PT E12	Good Manufacturing Practices	2	1	3
PT E13	Cosmetic Preparations	2	1	3

Table (4): Matrix indicating graduate attributes acquired by the student attending courses:

Semester (1)

Courses	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
Physical and Inorganic Chemistry (PC 101)	√										
Pharmaceutical Organic Chemistry-1 (PC 102)	√		√			√		√			
Biophysics (MD 101)	√					√		√		√	√
Botany and Medical Plants (PG 101)	√					√		√	√	√	
Cell Biology (MD 102)				√							
Mathematics and Statistics (MS 101)					√			√			√
Computer Sciences (CS 101)					√	√					
English Language (EN 101)					√	√					

Semester (2)

Courses	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
Pharmaceutical Organic Chemistry-2 (PC 203)	√		√			√		√			
Pharmaceutical Analytical Chemistry-1 (PC 205)	√		√								
Pharmacognosy-1 (PG 202)	√					√		√	√	√	
Histology (MD 203)				√							
Physical Pharmacy (PT 201)	√	√			√	√		√		√	√
Pharmacy Orientation (PT 202)	√	√				√	√	√		√	
Human Rights (HU 201)							√				

Semester (3)

Courses	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
Pharmaceutical Organic Chemistry-3 (PC 304)	√		√			√		√			
Pharmaceutical Analytical Chemistry-2 (PC 306)			√			√		√			
Pharmacognosy-2 (PG 303)	√		√			√		√	√	√	
Anatomy (MD 304)				√							
Physiology (MD 305)				√							
Medical Terminology (EN 302)				√	√						
Psychology (HU 302)						√		√			

Semester (4)

Courses	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
Biochemistry-1 (PB 401)	√		√		√	√					
Phytochemistry-1 (PG 404)	√		√			√		√	√		
Instrumental Analysis (PC 407)			√					√			
General Microbiology and Immunology (PM 401)			√	√							
Parasitology (MD 406)				√							
Pharmaceutical Dosage Forms-1 (PT 403)	√	√	√			√	√	√			
Pharmacy Legislation (PT 404)	√						√	√			

Semester (5)

Courses	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
Pharmacology-1 (PO 701)				√		√		√	√	√	
Pharmaceutical Microbiology (PM 704)			√								
Pharmaceutical Dosage Forms-2 (PT 505)	√	√	√		√	√	√	√		√	√
Biochemistry-2 (PB 502)	√		√	√	√	√		√		√	√
Phytochemistry-2 (PG 505)	√		√			√		√	√		
Pathophysiology (MD 507)				√				√			
Pharmacy Administration (PT 506)					√	√		√		√	√

Semester (6)

Courses	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
Medicinal Chemistry-1 (PC 509)	√					√		√	√	√	
Pharmaceutical Technology (PT 607)	√		√			√	√	√		√	
Community Pharmacy Practice (PT 608)	√	√		√	√	√	√	√	√		
Biopharmaceutical and Pharmacokinetics (PT 609)	√		√		√	√	√	√			√
Quality Control of Herbal Drugs (PG 606)	√		√			√		√	√	√	
Clinical Microbiology (PM 502)			√	√							
Tromas and First Aid (MD 609)				√			√	√		√	

Semester (7)

Courses	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
Pharmacology-2 (PO 802)				√	√	√		√	√		
Radiopharmaceuticals (PP 701)	√	√				√		√		√	√
Clinical Pharmacy-1 (PP 702)				√	√	√	√	√	√		
Hospital Pharmacy (PP 703)	√	√		√	√	√	√	√	√		
Controlled Drug Delivery Systems (PT 704)	√	√				√		√		√	
Public health and Preventive Medicine (MD 710)				√					√		
Pharmaceutical Biotechnology (PM 703)					√					√	
Pathology (MD 608)				√							

Semester (8)

Courses	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
Medicinal Chemistry-2 (PC 610)	√					√		√	√	√	
Clinical pharmacy-2 (PP 805)				√	√	√	√	√	√		
Phytotherapy (PG 807)				√	√			√	√		
Pharmaceuticals Analysis and Quality Control (PC 808)	√		√			√	√	√			
Clinical Biochemistry (PB 803)	√		√	√	√	√		√		√	√
Drug Marketing (PP 806)				√	√	√	√	√			
Drug Interactions (PO 803)				√		√		√	√		

Semester (9)

Courses	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
Toxicology and Forensic Chemistry (PO 904)				√		√		√	√		
Therapeutics-1 (PO 905)				√	√	√		√	√		
Clinical Pharmacokinetics (PP 907)				√	√	√	√	√			
Oncology (PP 908)				√		√	√	√	√		
Clinical Nutrition (PP 909)				√	√	√		√	√	√	
Clinical Pharmacology (PO 906)				√		√		√	√		
Sociology (HU 903)						√	√	√			

Semester (10)

Courses	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
Therapeutics-2 (PO 007)				√	√	√		√	√		
Treatment of Dermatological and Reproductive Diseases (PP 010)				√	√	√	√	√	√		
Treatment of Pediatrics Diseases (PP 011)				√	√	√	√	√	√		
Treatment of Cardiovascular Diseases (PP 012)				√	√	√	√	√	√		
Gastroenterology (PP 013)				√	√	√	√	√	√		
Treatment of Respiratory System Diseases (PP 014)				√	√	√	√	√	√		
Drug Information (PP 015)				√	√	√	√	√	√		

Elective courses & summer training

Courses	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
Drug Design					√	√					
Advanced Pharmaceutical Analysis-Spectroscopy					√	√		√		√	
Veterinary Pharmacology	√			√	√		√	√	√	√	
Biological Standardization	√		√		√	√	√	√		√	√
Antimicrobial Agents	√			√		√	√	√	√	√	
Alternative Medicinal Therapies	√	√		√	√	√	√	√	√	√	
Production and Manufacture of Medicinal Plants	√	√			√	√	√	√	√	√	
Chromatography and separation Techniques	√		√		√	√		√		√	√
Quality Assurance and GMP	√	√	√		√	√	√	√		√	√
Applied Industrial Pharmacy		√			√	√	√	√	√	√	
Good Manufacturing Practices		√	√		√	√	√	√		√	√
Cosmetic Preparations	√	√				√	√	√		√	
Summer Training	√	√	√	√	√	√	√	√	√	√	√

Table (5): Matrix indicating Clinical Pharmacy program courses ILOs: Semester (1)

[illegible]

Semester (1)

Courses	Intellectual skills																
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
Physical and Inorganic Chemistry															√		
Pharmaceutical Organic Chemistry-1			√		√	√					√						
Biophysics													√				
Botany and Medicinal Plants		√													√		
Cell Biology													√				
Mathematics and Statistics										√			√				
Computer Sciences													√				
English Language													√				

Semester (1)

Courses	Professional and practical skills												
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Physical and Inorganic Chemistry	√	√						√			√		
Pharmaceutical Organic Chemistry-1	√	√		√						√			
Biophysics		√						√			√		
Botany and Medicinal Plants	√	√											
Cell Biology	√					√							
Mathematics and Statistics											√		
Computer Sciences											√		
English Language	√				√						√		

Semester (1)

Courses	Transferable or general skills									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Physical and Inorganic Chemistry			√		√	√		√		
Pharmaceutical Organic Chemistry-1	√				√			√		
Biophysics	√	√	√	√	√	√		√	√	√
Botany and Medicinal Plants			√		√	√		√		
Cell Biology	√	√	√		√			√	√	√
Mathematics and Statistics	√			√			√			
Computer Sciences			√	√				√	√	√
English Language	√	√							√	

Semester (2)

Courses	Knowledge and understanding														
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
Pharmaceutical Organic Chemistry-2	√	√		√											
Pharmaceutical Analytical Chemistry-1	√		√	√											
Pharmacognosy-1	√												√		√
Histology	√										√				
Physical Pharmacy	√	√				√									
Pharmacy Orientation	√														
Human Rights															
Courses	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	
Pharmaceutical Organic Chemistry-2															
Pharmaceutical Analytical Chemistry-1		√													
Pharmacognosy-1													√		
Histology															
Physical Pharmacy		√													
Pharmacy Orientation														√	
Human Rights					√										

Semester (2)

Courses	Intellectual skills																
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
Pharmaceutical Organic Chemistry-2			√		√	√					√						
Pharmaceutical Analytical Chemistry-1		√															
Pharmacognosy-1		√													√		
Histology														√			
Physical Pharmacy	√						√						√				
Pharmacy Orientation	√												√				
Human Rights														√			

Semester (2)

Courses	Professional and practical skills												
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Pharmaceutical Organic Chemistry-2	√	√		√			√			√			
Pharmaceutical Analytical Chemistry-1		√											
Pharmacognosy-1	√	√							√				
Histology	√				√								
Physical Pharmacy		√	√					√			√	√	
Pharmacy Orientation	√										√		
Human Rights													

Semester (2)

Courses	Transferable or general skills									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Pharmaceutical Organic Chemistry-2	√				√			√		
Pharmaceutical Analytical Chemistry-1	√	√	√	√	√					
Pharmacognosy-1			√		√	√		√		
Histology	√									
Physical Pharmacy	√	√	√	√	√			√	√	√
Pharmacy Orientation	√	√	√	√	√			√	√	√
Human Rights					√					

Semester (3)

Courses	Knowledge and understanding														
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
Pharmaceutical Organic Chemistry-3	√	√		√	√										
Pharmaceutical Analytical Chemistry-2			√												
Pharmacognosy-2	√												√		√
Anatomy	√														
Physiology		√							√		√	√			
Medical Terminology	√										√				
Psychology	√											√			
Courses	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	
Pharmaceutical Organic Chemistry-3															
Pharmaceutical Analytical Chemistry-2															
Pharmacognosy-2													√		
Anatomy															
Physiology															
Medical Terminology															
Psychology				√											

Semester (3)

Courses	Intellectual skills																
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
Pharmaceutical Organic Chemistry-3			√		√	√					√						
Pharmaceutical Analytical Chemistry-2			√										√				
Pharmacognosy-2		√													√		
Anatomy														√			
Physiology														√			
Medical Terminology													√				
Psychology									√					√			

Semester (3)

Courses	Professional and practical skills												
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Pharmaceutical Organic Chemistry-3	√	√		√									
Pharmaceutical Analytical Chemistry-2		√									√		
Pharmacognosy-2	√	√							√				
Anatomy	√												
Physiology	√				√								
Medical Terminology	√				√						√		
Psychology					√								

Semester (3)

Courses	Transferable or general skills									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Pharmaceutical Organic Chemistry-3	√	√		√			√	√		
Pharmaceutical Analytical Chemistry-2	√		√	√	√			√		√
Pharmacognosy-2			√		√	√		√	√	
Anatomy	√									
Physiology	√									
Medical Terminology	√	√								
Psychology	√						√			

Semester (4)

Courses	Knowledge and understanding														
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
Biochemistry-1	√		√								√	√			
Phytochemistry-1	√	√		√									√		
Instrumental Analysis	√		√												
General Microbiology and Immunology										√	√	√			
Parasitology	√									√		√			
Pharmaceutical Dosage Forms-1	√	√				√									
Pharmacy Legislation	√														
Courses	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	
Biochemistry-1															
Phytochemistry-1															
Instrumental Analysis															
General Microbiology and Immunology								√							
Parasitology											√				
Pharmaceutical Dosage Forms-1		√													
Pharmacy Legislation					√									√	

Semester (4)

Courses	Intellectual skills																
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
Biochemistry-1													√				
Phytochemistry-1					√										√		
Instrumental Analysis			√		√		√						√				
General Microbiology and Immunology													√				
Parasitology								√					√				
Pharmaceutical Dosage Forms-1								√					√				
Pharmacy Legislation														√			

Semester (4)

Courses	Professional and practical skills												
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Biochemistry-1	√	√						√					
Phytochemistry-1	√	√		√									
Instrumental Analysis				√				√			√		
General Microbiology and Immunology						√					√		
Parasitology	√				√	√					√		
Pharmaceutical Dosage Forms-1	√	√	√				√				√		
Pharmacy Legislation											√		

Semester (4)

Courses	Transferable or general skills									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Biochemistry-1	√	√	√	√	√			√	√	
Phytochemistry-1			√	√	√	√		√		
Instrumental Analysis	√		√	√	√	√		√	√	√
General Microbiology and Immunology	√	√	√		√			√	√	√
Parasitology	√	√	√							
Pharmaceutical Dosage Forms-1	√	√	√	√	√	√		√	√	√
Pharmacy Legislation	√	√	√	√	√			√	√	√

Semester (5)

Courses	Knowledge and understanding														
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
Pharmacology-1	√					√		√			√	√	√	√	
Pharmaceutical Microbiology	√		√							√			√		
Pharmaceutical Dosage Forms-2	√	√				√				√					
Biochemistry-2	√		√								√	√			
Phytochemistry-2	√	√		√									√		
Pathophysiology	√	√	√	√									√		√
Pharmacy Administration	√														
Courses	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	
Pharmacology-1															
Pharmaceutical Microbiology						√		√							
Pharmaceutical Dosage Forms-2		√													
Biochemistry-2															
Phytochemistry-2															
Pathophysiology															
Pharmacy Administration			√	√											

Semester (5)

Courses	Intellectual skills																
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
Pharmacology-1					√				√	√	√		√	√			
Pharmaceutical Microbiology								√	√	√						√	
Pharmaceutical Dosage Forms-2	√	√	√							√			√				
Biochemistry-2													√	√			
Phytochemistry-2					√										√		
Pathophysiology								√	√								
Pharmacy Administration													√				

Semester (5)

Courses	Professional and practical skills												
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Pharmacology-1	√			√	√			√	√	√	√		
Pharmaceutical Microbiology						√							
Pharmaceutical Dosage Forms-2	√	√	√					√			√		
Biochemistry-2	√	√				√		√					
Phytochemistry-2	√	√		√									
Pathophysiology	√				√								
Pharmacy Administration											√		

Semester (5)

Courses	Transferable or general skills									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Pharmacology-1	√		√	√				√		√
Pharmaceutical Microbiology	√	√	√		√			√		√
Pharmaceutical Dosage Forms-2	√	√	√	√	√	√		√	√	√
Biochemistry-2	√	√	√	√	√			√	√	
Phytochemistry-2			√	√	√	√		√		
Pathophysiology	√	√	√		√					
Pharmacy Administration	√	√	√	√	√	√	√	√	√	√

Semester (6)

Courses	Knowledge and understanding														
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
Medicinal Chemistry-1				√	√								√		
Pharmaceutical Technology	√	√	√				√								
Community Pharmacy Practice	√											√	√		
Biopharmaceutics and Pharmacokinetics	√							√							
Quality Control of Herbal Drugs			√	√			√								√
Clinical Microbiology	√										√	√			
Tromas and First Aid	√														
Courses	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	
Medicinal Chemistry-1										√					
Pharmaceutical Technology														√	
Community Pharmacy Practice							√								
Biopharmaceutics and Pharmacokinetics		√			√										
Quality Control of Herbal Drugs						√									
Clinical Microbiology								√							
Tromas and First Aid	√														

Semester (6)

Courses	Intellectual skills																
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
Medicinal Chemistry-1					√								√				
Pharmaceutical Technology		√			√								√				
Community Pharmacy Practice									√	√	√			√			
Biopharmaceutics and Pharmacokinetics			√				√						√				
Quality Control of Herbal Drugs		√	√												√	√	
Clinical Microbiology								√					√				√
Tromas and First Aid									√							√	

Semester (6)

Courses	Professional and practical skills												
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Medicinal Chemistry-1		√		√									
Pharmaceutical Technology	√	√						√		√	√	√	
Community Pharmacy Practice	√		√		√				√	√			√
Biopharmaceutics and Pharmacokinetics	√			√				√			√		
Quality Control of Herbal Drugs	√		√	√					√		√		
Clinical Microbiology	√				√	√					√		
Tromas and First Aid					√								

Semester (6)

Courses	Transferable or general skills									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Medicinal Chemistry-1	√	√	√		√			√	√	√
Pharmaceutical Technology	√	√	√	√	√	√		√	√	√
Community Pharmacy Practice	√		√			√		√	√	√
Biopharmaceutics and Pharmacokinetics	√	√	√	√	√	√		√	√	√
Quality Control of Herbal Drugs	√	√	√	√	√	√	√	√		√
Clinical Microbiology	√		√							√
Tromas and First Aid			√					√		√

Semester (7)

Courses	Knowledge and understanding														
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
Pharmacology-2	√							√			√	√	√	√	
Radiopharmaceuticals	√	√													
Clinical Pharmacy-1	√								√			√	√		
Hospital Pharmacy	√							√	√		√			√	
Controlled Drug Delivery Systems	√	√				√									
Public Health and Preventive Medicine	√									√					
Pharmaceutical Biotechnology		√									√				
Pathology											√	√			
Courses	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	
Pharmacology-2		√													
Radiopharmaceuticals		√			√										
Clinical Pharmacy-1		√					√							√	
Hospital Pharmacy		√					√								
Controlled Drug Delivery Systems															
Public Health and Preventive Medicine															
Pharmaceutical Biotechnology										√					
Pathology															

Semester (7)

Courses	Intellectual skills																
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
Pharmacology-2					√				√	√	√		√	√			
Radiopharmaceuticals	√	√							√				√				
Clinical Pharmacy-1									√		√			√			√
Hospital pharmacy				√									√	√			
Controlled Drug Delivery Systems	√												√				
Public Health and Preventive Medicine								√					√				
Pharmaceutical Biotechnology		√											√	√			
Pathology													√				√

Semester (7)

Courses	Professional and practical skills												
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Pharmacology-2	√			√	√				√	√	√		
Radiopharmaceuticals	√	√									√		
Clinical Pharmacy-1	√				√				√	√	√		
Hospital pharmacy	√	√	√		√					√	√		
Controlled Drug Delivery Systems	√	√									√		
Public Health and Preventive Medicine					√				√	√	√		
Pharmaceutical Biotechnology						√					√	√	
Pathology	√				√	√							

Semester (7)

Courses	Transferable or general skills									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Pharmacology-2	√	√	√		√			√	√	√
Radiopharmaceuticals	√	√	√	√	√	√		√	√	√
Clinical Pharmacy-1	√	√	√			√		√	√	√
Hospital pharmacy	√		√	√		√		√	√	√
Controlled Drug Delivery Systems	√	√	√	√	√	√		√	√	√
Public Health and Preventive Medicine	√	√			√			√		√
Pharmaceutical Biotechnology	√	√	√	√	√			√	√	√
Pathology	√	√			√			√		√

Semester (8)

Courses	Knowledge and understanding														
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
Medicinal Chemistry-2				√	√								√		
Clinical Pharmacy-2	√											√	√		
Phytotherapy	√												√		√
Pharmaceuticals Analysis and Quality Control		√	√			√	√								
Clinical Biochemistry	√	√	√								√	√			
Drug Marketing															
Drug Interactions	√							√			√		√		
Courses	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	
Medicinal Chemistry-2															
Clinical Pharmacy-2							√								
Phytotherapy															
Pharmaceuticals Analysis and Quality Control					√	√			√					√	
Clinical Biochemistry															
Drug Marketing				√											
Drug Interactions													√		

Semester (8)

Courses	Intellectual skills																
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
Medicinal Chemistry-2			√		√								√				
Clinical Pharmacy-2									√	√	√		√	√			√
Phytotherapy									√							√	
Pharmaceuticals Analysis and Quality Control		√	√										√	√			
Clinical Biochemistry													√	√			
Drug Marketing												√					
Drug Interactions				√							√						

Semester (8)

Courses	Professional and practical skills												
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Medicinal Chemistry-2		√		√									
Clinical Pharmacy-2	√				√				√	√	√		
Phytotherapy	√							√	√				
Pharmaceuticals Analysis and Quality Control		√		√				√			√		
Clinical Biochemistry	√	√			√	√		√					
Drug Marketing										√	√		
Drug Interactions					√				√	√			

Semester (8)

Courses	Transferable or general skills									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Medicinal Chemistry-2	√	√	√		√			√	√	√
Clinical Pharmacy-2	√		√		√	√		√	√	√
Phytotherapy	√		√		√	√		√	√	√
Pharmaceuticals Analysis and Quality Control	√		√		√	√		√		√
Clinical Biochemistry	√	√	√	√	√			√	√	√
Drug Marketing	√	√	√			√	√	√	√	√
Drug Interactions			√		√					√

Semester (9)

Courses	Knowledge and understanding														
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
Toxicology and Forensic Chemistry	√	√									√	√	√		
Therapeutics-1	√					√		√	√		√	√	√	√	
Clinical Pharmacokinetics								√							
Oncology	√							√	√		√	√	√		
Clinical Nutrition	√										√	√	√		√
Clinical Pharmacology	√							√			√	√	√	√	
Sociology	√														
Courses	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	
Toxicology and Forensic Chemistry	√												√		
Therapeutics-1												√	√		
Clinical Pharmacokinetics		√													
Oncology												√		√	
Clinical Nutrition															
Clinical Pharmacology															
Sociology					√										

Semester (9)

Courses	Intellectual skills																
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
Toxicology and Forensic Chemistry									√		√					√	
Therapeutics-1									√	√	√			√			
Clinical Pharmacokinetics										√			√	√			
Oncology									√	√	√		√	√			√
Clinical Nutrition									√	√				√			√
Clinical Pharmacology									√	√	√						
Sociology																	

Semester (9)

Courses	Professional and practical skills												
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Toxicology and Forensic Chemistry							√		√				
Therapeutics-1					√					√			
Clinical Pharmacokinetics	√								√	√			√
Oncology	√	√			√					√	√		√
Clinical Nutrition	√				√					√			√
Clinical Pharmacology					√					√			√
Sociology					√					√			

Semester (9)

Courses	Transferable or general skills									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Toxicology and Forensic Chemistry		√						√		√
Therapeutics-1		√			√			√		√
Clinical Pharmacokinetics	√		√	√		√		√	√	√
Oncology		√	√		√			√		√
Clinical Nutrition	√	√	√	√	√			√	√	√
Clinical Pharmacology		√						√		
Sociology	√									

Semester (10)

Courses	Knowledge and understanding														
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
Therapeutics-2	√					√		√			√	√	√	√	
Treatment of Dermatological and Reproductive Diseases												√	√		
Treatment of Pediatrics Diseases												√	√		
Treatment of Cardiovascular Diseases												√	√		
Gastroenterology												√	√		
Treatment of Respiratory System Diseases									√			√	√		
Drug Information															
Courses	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	
Therapeutics-2												√	√		
Treatment of Dermatological and Reproductive Diseases												√			
Treatment of Pediatrics Diseases												√			
Treatment of Cardiovascular Diseases												√			
Gastroenterology												√			
Treatment of Respiratory System Diseases												√			
Drug Information		√											√		

Semester (10)

Courses	Intellectual skills																
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
Therapeutics-2									√	√	√						
Treatment of Dermatological and Reproductive Diseases									√		√		√	√			√
Treatment of Pediatrics Diseases									√	√	√		√	√			√
Treatment of Cardiovascular Diseases									√		√		√	√			√
Gastroenterology									√		√		√	√			√
Treatment of Respiratory System Diseases									√	√	√		√	√			√
Drug Information												√	√				

Semester (10)

Courses	Professional and practical skills												
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Therapeutics-2					√					√			
Treatment of Dermatological and Reproductive Diseases	√				√				√	√			√
Treatment of Pediatrics Diseases	√				√				√	√			√
Treatment of Cardiovascular Diseases	√				√				√	√			√
Gastroenterology	√				√				√	√			√
Treatment of Respiratory System Diseases	√				√				√	√			√
Drug Information	√									√	√		

Semester (10)

Courses	Transferable or general skills									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Therapeutics-2		√			√			√		√
Treatment of Dermatological and Reproductive Diseases	√		√			√		√	√	√
Treatment of Pediatrics Diseases	√		√			√		√	√	√
Treatment of Cardiovascular Diseases	√		√			√		√	√	√
Gastroenterology	√		√			√		√	√	√
Treatment of Respiratory System Diseases	√		√			√		√	√	√
Drug Information	√	√		√		√		√		√

Elective courses and summer training

Courses	Knowledge and understanding														
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
Drug Design					√										
Advanced Pharmaceutical Analysis- Spectroscopy							√								
Veterinary Pharmacology	√					√		√		√		√	√	√	
Biological Standardization	√		√	√			√								
Antimicrobial Agents	√							√			√		√		
Alternative Medicinal Therapies	√	√										√	√	√	√
Production and Manufacture of Medicinal Plants	√	√		√									√	√	√
Chromatography and separation Techniques			√	√											
Quality Assurance and GMP	√		√	√			√								
Applied Industrial Pharmacy							√								
Good Manufacture Practices	√		√				√								
Cosmetic Preparations	√	√				√									
Summer Training	√	√	√	√	√	√	√	√	√	√	√	√			

Courses	Knowledge and understanding													
	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29
Drug Design														
Advanced Pharmaceutical Analysis- Spectroscopy														
Veterinary Pharmacology	√										√			
Biological Standardization		√							√					
Antimicrobial Agents	√							√						
Alternative Medicinal Therapies														
Production and Manufacture of Medicinal Plants														√
Chromatography and separation Techniques														
Quality Assurance and GMP		√				√								
Applied Industrial Pharmacy														
Good Manufacture Practices		√								√				
Cosmetic Preparations					√							√		
Summer Training														

Elective courses and summer training

Courses	Intellectual skills																
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
Drug Design						√											
Advanced Pharmaceutical Analysis-Spectroscopy			√		√								√	√			
Veterinary Pharmacology	√							√	√	√			√	√			
Biological Standardization		√	√		√	√	√						√	√			
Antimicrobial Agents								√		√	√		√				
Alternative Medicinal Therapies				√					√		√				√		
Production and Manufacture of Medicinal Plants	√		√	√	√					√			√		√		
Chromatography and separation Techniques					√								√		√		
Quality Assurance and GMP	√	√	√					√									
Applied Industrial Pharmacy	√											√					
Good Manufacture Practices	√	√	√					√									
Cosmetic Preparations	√		√														
Summer Training	√	√	√	√	√	√	√										

Elective courses and summer training

Courses	Professional and practical skills												
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Drug Design	√										√		
Advanced Pharmaceutical Analysis-Spectroscopy	√	√		√				√			√		
Veterinary Pharmacology	√				√		√		√	√	√		
Biological Standardization	√	√		√				√			√		
Antimicrobial Agents	√	√		√	√	√	√		√	√	√		
Alternative Medicinal Therapies	√				√				√	√	√		
Production and Manufacture of Medicinal Plants	√	√	√	√					√		√		
Chromatography and separation Techniques	√			√				√			√		
Quality Assurance and GMP	√		√			√		√			√		
Applied Industrial Pharmacy	√		√					√			√	√	
Good Manufacture Practices	√		√			√		√			√	√	
Cosmetic Preparations	√	√						√			√		
Summer Training	√	√	√	√	√	√	√	√	√	√			

Elective courses and summer training

Courses	Transferable or general skills									
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Drug Design	√		√	√				√	√	
Advanced Pharmaceutical Analysis-Spectroscopy		√	√	√					√	√
Veterinary Pharmacology	√	√	√		√				√	
Biological Standardization	√	√	√	√		√			√	√
Antimicrobial Agents	√	√	√		√	√				
Alternative Medicinal Therapies	√	√	√			√				√
Production and Manufacture of Medicinal Plants	√	√			√	√	√		√	√
Chromatography and separation Techniques			√	√	√	√		√		√
Quality Assurance and GMP	√	√	√			√	√	√	√	
Applied Industrial Pharmacy	√	√	√			√	√	√	√	√
Good Manufacture Practices	√	√	√			√	√	√	√	√
Cosmetic Preparations	√	√	√	√	√	√		√	√	√
Summer Training	√	√	√	√	√	√	√	√	√	√

**Table (6): Courses contribution to the Graduate attributes and program ILOs
Semester (1)**

Course Code	Course Title	Hours / week		NARS	Graduate attributes & Program ILOs
		Lect.	Pract.		
PC 101	Physical and Inorganic Chemistry	2	1	1.1	1
				2.1, 2.2	A1, A2
				3.1, 3.2, 3.8, 3.11	C1, C2, C8, C11
				4.13	B13
				5.1, 5.2, 5.3, 5.4, 5.8, 5.9, 5.10	D1, D2, D3, D4, D8, D9, D10
PC 102	Pharmaceutical Organic Chemistry-1	2	1	1.1, 1.3, 1.8, 1.10	1, 3, 6, 8
				2.1, 2.2, 2.4	A1, A2, A4
				3.1, 3.2, 3.4, 3.10	C1, C2, C4, C10
				4.3, 4.5, 4.6, 4.11	B3, B5, B6, B11
				5.1, 5.5, 5.8	D1, D5, D8
MD 101	Biophysics	1	1	1.1, 1.6, 1.8, 1.10	1, 6, 8, 10, 11
				2.1, 2.17	A1, A17
				3.2, 3.8, 3.11	C2, C8, C11
				4.13	B13
				5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.8, 5.9, 5.10	D1, D2, D3, D4, D5, D6, D8, D9, D10
PG 101	Botany and Medicinal Plants	2	1	1.1, 1.4, 1.6, 1.8, 1.10	1, 6, 8, 9, 10
				2.1, 2.15	A1, A15
				3.1, 3.2	C1, C2
				4.2	B2, B15
				5.3, 5.5, 5.6, 5.8	D3, D5, D6, D8
MD 102	Cell Biology	1	1	1.5	4
				2.11, 2.12	A11, A12
				3.1, 3.2	C1, C2
				4.13	B13
				5.3, 5.5, 5.6, 5.8	D3, D5, D6, D8
MS 101	Mathematics and Statistics	2	---	1.6, 1.7, 1.10	5, 8, 11
				2.1, 2.17, 2.18	A1, A17, A18
				3.11	C11
				4.10, 4.13	B10, B13
				5.1, 5.4, 5.7	D1, D4, D7
CS101	Computer Sciences	1	1	1.7, 1.8,	5, 6
				2.19	A19, A28
				3.11	C11
				4.13	B13
				5.3, 5.4, 5.8, 5.9, 5.10	D3, D4, D8, D9, D10
EN 101	English Language	2	---	1.7, 1.8	5, 6
				2.1	A1
				3.1, 3.5, 3.12	C1, C5, C11
				4.13	B13
				5.1, 5.2, 5.9	D1, D2, D9

Semester (2)

Course Code	Course Title	Hours/week		NARS	Graduate attributes & Program ILOs
		Lect.	Pract		
PC203	Pharmaceutical Organic Chemistry-2	2	1	1.1, 1.3, 1.8, 1.10	1, 3, 6, 8
				2.1, 2.2, 2.4	A1, A2, A4
				3.1, 3.2, 3.4, 3.7, 3.10	C1, C2, C4, C7, C10
				4.3, 4.5, 4.6, 4.11	B3, B5, B6, B11
				5.1, 5.5, 5.8	D1, D5, D8
PC 205	Pharmaceutical Analytical Chemistry-1	2	1	1.1, 1.3	1, 3
				2.1, 2.3, 2.4, 2.17	A1, A3, A4, A17
				3.2	C2
				4.2	B2
				5.1, 5.2, 5.3, 5.4, 5.5	D1, D2, D3, D4, D5
PG 202	Pharmacognosy-1	2	1	1.1, 1.4, 1.6, 1.8, 1.10	1, 6, 8, 9, 10
				2.1, 2.13, 2.15	A1, A13, A15, A28
				3.1, 3.2, 3.9	C1, C2, C9
				4.2	B2, B15
				5.3, 5.5, 5.6, 5.8	D3, D5, D6, D8
MD 203	Histology	2	1	1.5	4
				2.1, 2.11	A1, A11
				3.1, 3.5	C1, C5
				4.14	B14
				5.1	D1
PT 201	Physical Pharmacy	2	1	1.1, 1.2, 1.6, 1.7, 1.8, 1.10	1, 2, 5, 6, 8, 10, 11
				2.1, 2.2, 2.6, 2.17	A1, A2, A6, A17
				3.2, 3.3, 3.8, 3.11, 3.12	C2, C3, C8, C11, C12
				4.1, 4.7, 4.13	B1, B7, B13
				5.1, 5.2, 5.3, 5.4, 5.5, 5.8, 5.9, 5.10	D1, D2, D3, D4, D5, D8, D9, D10
PT 202	Pharmacy Orientation	2	-	1.1, 1.2, 1.6, 1.8, 1.9, 1.10	1, 2, 6, 7, 8, 10
				2.1, 2.20	A1, A29
				3.1, 3.12	C1, C11
				4.1, 4.13	B1, B13
				5.1, 5.2, 5.3, 5.4, 5.5, 5.8, 5.9, 5.10	D1, D2, D3, D4, D5, D8, D9, D10
HU 201	Human Rights	2	-	1.9	7
				2.21	A20
				-----	-----
				4.14	B14
				5.5	D5

Semester (3)

Course Code	Course Title	hours/week		NARS	Graduate attributes & Program ILOs
		Lect.	Pract.		
PC 304	Pharmaceutical Organic Chemistry-3	2	1	1.1, 1.3, 1.8, 1.10	1,3, 6, 8
				2.1, 2.2, 2.4, 2.5	A1, A2, A4, A5
				3.1, 3.2, 3.4	C1, C2, C4
				4.3, 4.5, 4.6, 4.11	B3, B5, B6, B11
				5.1, 5.2, 5.4, 5.7, 5.8	D1, D2, D4, D7, D8
PC 306	Pharmaceutical Analytical Chemistry-2	2	1	1.3, 1.8, 1.10	3, 6, 8
				2.3	A3
				3.2, 3.11	C2, C11
				4.3, 4.13	B3, B13
				5.1, 5.3, 5.4, 5.5, 5.8, 5.10	D1, D3, D4, D5, D8, D10
PG 303	Pharmacognosy-2	2	1	1.1, 1.3, 1.4, 1.6, 1.8, 1.10	1, 3, 6, 8, 9, 10
				2.1, 2.13, 2.15	A1, A13, A15, A28
				3.1, 3.2, 3.9	C1, C2, C9
				4.2	B2, B15
				5.3, 5.5, 5.6, 5.8, 5.9	D3, D5, D6, D8, D9
MD 304	Anatomy	1	1	1.5	4
				2.1	A1
				3.1	C1
				4.14	B14
				5.1	D1
MD 305	Physiology	3	1	1.5	4
				2.2, 2.9, 2.11, 2.12	A2, A9, A11, A12
				3.1, 3.5	C1, C5
				4.14	B14
				5.1	D1
EN 302	Medical Terminology	2	-	1.5, 1.7	4, 5
				2.1, 2.11	A1, A11
				3.1, 3.5, 3.12	C1, C5, C11
				4.13	B13
				5.1, 5.2	D1, D2
HU 302	Psychology	2	-	1.8, 1.10	6, 8
				2.1, 2.12, 2.19	A1, A12, A19
				3.5	C5
				4.9, 4.14	B9, B14
				5.1, 5.7	D1, D7

Semester (4)

Course Code	Course Title	hours/ week		NARS	Graduate attributes & Program ILOs
		Lect	Pract		
PB 401	Biochemistry-1	2	1	1.1, 1.3, 1.7, 1.8	1, 3, 5, 6
				2.1, 2.3, 2.11, 2.12	A1, A3, A11, A12
				3.1, 3.2, 3.8	C1, C2, C8
				4.13	B13
				5.1, 5.2, 5.3, 5.4, 5.5, 5.8, 5.9	D1, D2, D3, D4, D5, D8, D9
PG 404	Phytochemistry-1	2	1	1.1, 1.3, 1.4, 1.8, 1.10	1, 3, 6, 8, 9
				2.1, 2.2, 2.4, 2.13	A1, A2, A4, A13
				3.1, 3.2, 3.4	C1, C2, C4
				4.5	B5, B15
				5.3, 5.4, 5.5, 5.6, 5.8	D3, D4, D5, D6, D8
PC 407	Instrumental Analysis	1	1	1.3, 1.8, 1.10	3, 6, 8
				2.1, 2.3	A1, A3
				3.4, 3.8, 3.11, 3.12	C4, C8, C11
				4.3, 4.5, 4.7, 4.13	B3, B5, B7, B13
				5.1, 5.3, 5.4, 5.5, 5.6, 5.8, 5.9, 5.10	D1, D3, D4, D5, D6, D8, D9, D10
PM 401	General Microbiology and Immunology	3	1	1.3, 1.5	3, 4
				2.10, 2.11, 2.12	A10, A11, A12, A23
				3.6, 3.11	C6, C11
				4.13	B13
				5.1, 5.2, 5.3, 5.5, 5.8, 5.9, 5.10	D1, D2, D3, D5, D8, D9, D10
MD 406	Parasitology	1	1	1.5	4
				2.1, 2.10, 2.12	A1, A10, A12, A26
				3.1, 3.5, 3.6, 3.11	C1, C5, C6, C11
				4.8, 4.13	B8, B13
				5.1, 5.2, 5.3	D1, D2, D3
PT 403	Pharmaceutical Dosage Forms-1	2	1	1.1, 1.2, 1.3, 1.8, 1.9, 1.10	1, 2, 3, 6, 7, 8
				2.1, 2.2, 2.6, 2.17	A1, A2, A6, A17
				3.1, 3.2, 3.3, 3.7, 3.11, 3.12	C1, C2, C3, C7, C11
				4.8, 4.13	B8, B13
				5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.8, 5.9, 5.10	D1, D2, D3, D4, D5, D6, D8, D9, D10
PT 404	Pharmacy Legislation	1	-	1.1, 1.9, 1.10	1, 7, 8
				2.1, 2.20, 2.21	A1, A20, A29
				3.12	C11
				4.14	B14
				5.1, 5.2, 5.3, 5.4, 5.5, 5.8, 5.9, 5.10	D1, D2, D3, D4, D5, D8, D9, D10

Semester (5)

Course Code	Course Title	hours/week Lect. Pract	NARS	Graduate attributes & Program ILOs
PO 701	Pharmacology-1	2	1	1.4, 1.5, 1.6, 1.8, 1.10
				4, 6, 8, 9, 10
				2.1, 2.6, 2.8, 2.11, 2.12, 2.13, 2.14
				A1, A6, A8, A11, A12, A13, A14
				3.1, 3.4, 3.5, 3.8, 3.9, 3.10, 3.11, 3.12
PM 704	Pharmaceutical Microbiology	2	1	C1, C4, C5, C8, C9, C10, C11
				4.5, 4.9, 4.10, 4.11, 4.13, 4.14
				B5, B9, B10, B11, B13, B14
				5.1, 5.3, 5.4, 5.8, 5.10
				D1, D3, D4, D8, D10
PT 505	Pharmaceutical Dosage Forms-2	2	1	1.3
				3
				2.1, 2.3, 2.10, 2.13
				A1, A3, A10, A13, A21, A23
				3.6
PB 502	Biochemistry-2	2	1	C6
				4.8, 4.9, 4.10
				B8, B9, B10, B16
				5.1, 5.2, 5.3, 5.5, 5.8, 5.10
				D1, D2, D3, D5, D8, D10
PG 505	Phytochemistry -2	2	1	1.1, 1.2, 1.3, 1.6, 1.7, 1.8, 1.9, 1.10
				1, 2, 3, 5, 6, 7, 8, 10, 11
				2.1, 2.2, 2.6, 2.10, 2.17
				A1, A2, A6, A10, A17
				3.1, 3.2, 3.3, 3.8, 3.11, 3.12
MD 507	Pathophysiology	2	-	C1, C2, C3, C8, C11
				4.1, 4.2, 4.3, 4.10, 4.13
				B1, B2, B3, B10, B13
				5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.8, 5.9, 5.10
				D1, D2, D3, D4, D5, D6, D8, D9, D10
PT 506	Pharmacy Administration	2	-	1.1, 1.3, 1.5, 1.6, 1.7, 1.8, 1.10
				1, 3, 4, 5, 6, 8, 10, 11
				2.1, 2.3, 2.11, 2.12
				A1, A3, A11, A12
				3.1, 3.2, 3.6, 3.8
MD 507	Pathophysiology	2	-	C1, C2, C6, C8
				4.13, 4.14
				B13, B14
				5.1, 5.2, 5.3, 5.4, 5.5, 5.8, 5.9
				D1, D2, D3, D4, D5, D8, D9
PG 505	Phytochemistry -2	2	1	1.1, 1.3, 1.4, 1.8, 1.10
				1, 3, 6, 8, 9
				2.1, 2.2, 2.4, 2.13
				A1, A2, A4, A13
				3.1, 3.2, 3.4
MD 507	Pathophysiology	2	-	C1, C2, C4
				4.5
				B5, B15
				5.3, 5.4, 5.5, 5.6, 5.8
				D3, D4, D5, D6, D8
MD 507	Pathophysiology	2	-	1.5, 1.10
				4, 8
				2.11, 2.12
				A11, A12
				3.1, 3.5
PT 506	Pharmacy Administration	2	-	C1, C5
				4.8, 4.9
				B8, B9
				5.1, 5.2, 5.3, 5.5
				D1, D2, D3, D5
PT 506	Pharmacy Administration	2	-	1.6, 1.7, 1.8, 1.10
				5, 6, 8, 10, 11
				2.1, 2.18, 2.19
				A1, A18, A19
				3.11, 3.12
PT 506	Pharmacy Administration	2	-	C11
				4.13
				B13
				5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10
				D1, D2, D3, D4, D5, D6, D7, D8, D9, D10

Semester (6)

Course Code	Course Title	Hours/ Week Lect. Pract.	NARS	Graduate attributes & Program ILOs
PC 509	Medicinal Chemistry-1	2	1	1.1, 1.4, 1.6, 1.8, 1.10
				2.4, 2.5, 2.13
				3.2, 3.4
				4.5, 4.13
				5.1, 5.2, 5.3, 5.5, 5.8, 5.9, 5.10
PT 607	Pharmaceutical Technology	2	1	1.1, 1.3, 1.6, 1.8, 1.9, 1.10
				2.1, 2.2, 2.3, 2.7, 2.20
				3.1, 3.2, 3.8, 3.10, 3.11, 3.12
				4.2, 4.5, 4.13
				5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.8, 5.9, 5.10
PT 608	Community Pharmacy Practice	2	1	1.1, 1.2, 1.4, 1.5, 1.7, 1.8, 1.9, 1.10
				2.1, 2.12, 2.13
				3.1, 3.3, 3.5, 3.9, 3.10
				4.9, 4.10, 4.11, 4.14
				5.1, 5.3, 5.6, 5.8, 5.9, 5.10
PT 609	Biopharmaceutics and Pharmacokinetics	2	1	1.1, 1.3, 1.6, 1.7, 1.8, 1.9, 1.10
				2.1, 2.8, 2.17, 2.21
				3.1, 3.4, 3.8, 3.11, 3.12
				4.3, 4.7, 4.13
				5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.8, 5.9, 5.10
PG 606	Quality Control of Herbal Drugs	2	1	1.1, 1.3, 1.4, 1.6, 1.8, 1.10
				2.3, 2.4, 2.7, 2.15
				3.1, 3.3, 3.4, 3.9, 3.11, 3.12
				4.2, 4.3
				5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.10
PM 502	Clinical Microbiology	2	1	1.3, 1.5
				2.1, 2.11, 2.12
				3.1, 3.5, 3.6, 3.11
				4.8, 4.13
				5.1, 5.3, 5.10
MD 609	Tromas and First Aid	2	-	1.5, 1.8, 1.9, 1.10
				2.1, 2.16
				3.5
				4.9
				5.3, 5.8, 5.10

Semester (7)

Course Code	Course Title	Hours / week Lect. Pract.		NARS	Graduate attributes & Program ILOs
PO 802	Pharmacology-2	2	1	1.4, 1.5, 1.7, 1.8, 1.10	4, 5, 6, 8, 9
				2.1, 2.8, 2.11, 2.12, 2.13, 2.14, 2.17	A1, A8, A11, A12, A13, A14, A17
				3.1, 3.4, 3.5, 3.9, 3.10, 3.11	C1, C4, C5, C9, C10, C11
				4.5, 4.9, 4.10, 4.11, 4.13, 4.14	B5, B9, B10, B11, B13, B14
				5.1, 5.2, 5.3, 5.5, 5.8, 5.9, 5.10	D1, D2, D3, D5, D8, D9, D10
PP 701	Radiopharmaceuticals	1	-	1.1, 1.2, 1.6, 1.8, 1.10	1, 2, 6, 8, 10, 11
				2.1, 2.2, 2.17, 2.21	A1, A2, A17, A20
				3.1, 3.2, 3.11, 3.12	C1, C2, C11
				4.1, 4.2, 4.9, 4.13	B1, B2, B9, B13
				5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.8, 5.9, 5.10	D1, D2, D3, D4, D5, D6, D8, D9, D10
PP 702	Clinical Pharmacy-1	2	1	1.4, 1.5, 1.7, 1.8, 1.9, 1.10	4, 5, 6, 7, 8, 9
				2.1, 2.9, 2.12, 2.13, 2.17, 2.20	A1, A9, A12, A13, A17, A22, A29
				3.1, 3.5, 3.9, 3.10, 3.12	C1, C5, C9, C10, C11
				4.9, 4.11, 4.14	B9, B11, B14, B17
				5.1, 5.2, 5.3, 5.6, 5.8, 5.9, 5.10	D1, D2, D3, D6, D8, D9, D10
PP 703	Hospital Pharmacy	2	1	1.1, 1.2, 1.4, 1.5, 1.7, 1.8, 1.9, 1.10	1, 2, 4, 5, 6, 7, 8, 9
				2.1, 2.8, 2.9, 2.11, 2.14, 2.17	A1, A8, A9, A11, A14, A17, A22
				3.1, 3.2, 3.3, 3.5, 3.10, 3.12	C1, C2, C3, C5, C10, C11
				4.4, 4.13, 4.14	B4, B13, B14
				5.1, 5.3, 5.4, 5.6, 5.8, 5.9, 5.10	D1, D3, D4, D6, D8, D9, D10
PT 704	Controlled Drug Delivery Systems	2	-	1.1, 1.2, 1.6, 1.8, 1.10	1, 2, 6, 8, 10
				2.1, 2.2, 2.6	A1, A2, A6
				3.1, 3.2, 3.11, 3.12	C1, C2, C11
				4.1, 4.13	B1, B13
				5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.8, 5.9, 5.10	D1, D2, D3, D4, D5, D6, D8, D9, D10
MD 710	Public Health and Preventive Medicine	2	-	1.4, 1.5	4, 9
				2.1, 2.10	A1, A10
				3.5, 3.9, 3.10, 3.11	C5, C9, C10, C11
				4.8, 4.13	B8, B13
				5.1, 5.2, 5.5, 5.8, 5.10	D1, D2, D5, D8, D10

PM 703	Pharmaceutical Biotechnology	2	1	1.6, 1.7	5, 10
				2.2, 2.11	A2, A11, A25
				3.6, 3.11	C6, C11, C12
				4.2, 4.13, 4.14	B2, B13, B14
				5.1, 5.2, 5.3, 5.4, 5.5, 5.8, 5.9, 5.10	D1, D2, D3, D4, D5, D8, D9, D10
MD 608	Pathology	2	1	1.5	4
				2.11, 2.12	A11, A12
				3.1, 3.5, 3.6	C1, C5, C6
				4.13	B13 , B17
				5.1, 5.2, 5.5, 5.8, 5.10	D1, D2, D5, D8, D10

Semester (8)

Course Code	Course Title	Hours/week		NARS	Graduate attributes & Program ILOs
		Lect.	Pract.		
PC 610	Medicinal Chemistry-2	2	1	1.1, 1.4, 1.6, 1.8, 1.10	1, 6, 8, 9, 10
				2.4, 2.5, 2.13	A4, A5, A13
				3.2, 3.4	C2, C4
				4.3, 4.5, 4.13	B3, B5, B13
				5.1, 5.2, 5.3, 5.5, 5.8, 5.9, 5.10	D1, D2, D3, D5, D8, D9, D10
PP805	Clinical Pharmacy-2	2	1	1.4, 1.5, 1.7, 1.8, 1.9, 1.10	4, 5, 6, 7, 8, 9
				2.1, 2.12, 2.13	A1, A12, A13, A22
				3.1, 3.5, 3.9, 3.10, 3.12	C1, C5, C9, C10, C11
				4.9, 4.10, 4.11, 4.13, 4.14	B9, B10, B11, B13, B14, B17
				5.1, 5.3, 5.5, 5.6, 5.8, 5.9, 5.10	D1, D3, D5, D6, D8, D9, D10
PG 807	Phytotherapy	2	1	1.4, 1.5, 1.7, 1.10	4, 5, 8, 9
				2.1, 2.13	A1, A13, A15
				3.1, 3.8, 3.9	C1, C8, C9
				4.9	B9, B16
				5.1, 5.3, 5.5, 5.6, 5.8, 5.9, D.10	D1, D3, D5, D6, D8, D9, D10
PC 808	Pharmaceuticals Analysis and Quality Control	2	1	1.1, 1.3, 1.8, 1.9, 1.10	1, 3, 6, 7, 8
				2.2, 2.3, 2.6, 2.7, 2.20, 2.21	A2, A3, A6, A7, A20, A21, A24, A29
				3.2, 3.4, 3.8, 3.12	C2, C4, C8, C11
				4.2, 4.3, 4.13, 4.14	B2, B3, B13, B14
				5.1, 5.3, 5.5, 5.6, 5.8, 5.10	D1, D3, D5, D6, D8, D10
PB 803	Clinical Biochemistry	2	1	1.1, 1.3, 1.5, 1.6, 1.7, 1.8, 1.10	1, 3, 4, 5, 6, 8, 10, 11
				2.1, 2.2, 2.3, 2.11, 2.12	A1, A2, A3, A11, A12
				3.1, 3.2, 3.5, 3.6, 3.8	C1, C2, C5, C6, C8
				4.13, 4.14	B13, B14
				5.1, 5.2, 5.3, 5.4,	D1, D2, D3, D4, D5, D8, D9, D10

				5.5, 5.8, 5.9, 5.10	
PP 806	Drug Marketing	1	-	1.5, 1.7, 1.8, 1.9, 1.10	4, 5, 6, 7, 8
				2.19	A19
				3.10, 3.12	C10, C11
				4.12	B12
				5.1, 5.2, 5.3, 5.6, 5.7, 5.8, 5.9, 5.10	D1, D2, D3, D6, D7, D8, D9, D10
PO803	Drug Interactions	2	-	1.4, 1.5, 1.8, 1.10	4, 6, 8, 9
				2.1, 2.8, 2.11, 2.13	A1, A8, A11, A13, A28
				3.5, 3.9, 3.10	C5, C9, C10
				4.4, 4.11	B4, B11
				5.3, 5.5, 5.10	D3, D5, D10

Semester (9)

Course Code	Course Title	Hours/week		NARS	Graduate attributes & Program ILOs
		Lect.	Pract.		
PO 904	Toxicology and Forensic Chemistry	2	1	1.4, 1.5, 1.8, 1.10	4, 6, 8, 9
				2.1, 2.2, 2.11, 2.12, 2.13, 2.16	A1, A2, A11, A12, A13, A16, A28
				3.7, 3.9	C7, C9
				4.9, 4.11	B9, B11, B16
				5.2, 5.8, 5.10	D2, D8, D10
PO 905	Therapeutics-1	2	1	1.4, 1.5, 1.7, 1.8, 1.10	4, 5, 6, 8, 9
				2.1, 2.6, 2.8, 2.9, 2.11, 2.12, 2.13, 2.14	A1, A6, A8, A9, A11, A12, A13, A14, A27, A28
				3.5, 3.10	C5, C10
				4.9, 4.10, 4.11, 4.14	B9, B10, B11, B14
				5.2, 5.5, 5.8, 5.10	D2, D5, D8, D10
PP 907	Clinical Pharmacokinetics	2	1	1.5, 1.7, 1.8, 1.9, 1.10	4, 5, 6, 7, 8
				2.8, 2.17	A8, A17
				3.1, 3.9, 3.10	C1, C9, C10, C13
				4.10, 4.13, 4.14	B10, B13, B14
				5.1, 5.3, 5.4, 4.6, 5.8, 5.9, 5.10	D1, D3, D4, D6, D8, D9, D10
PP 908	Oncology	2	1	1.4, 1.5, 1.8, 1.9, 1.10	4, 6, 7, 8, 9
				2.1, 2.8, 2.9, 2.11, 2.12, 2.13, 2.20	A1, A8, A9, A11, A12, A13, A27, A29
				3.1, 3.2, 3.5, 3.10, 3.12	C1, C2, C5, C10, C11, C13
				4.9, 4.10, 4.11, 4.13, 4.14	B9, B10, B11, B13, B14, B17
				5.2, 5.3, 5.5, 5.8, 5.10	D2, D3, D5, D8, D10
PP 909	Clinical Nutrition	1	1	1.4, 1.5, 1.6, 1.7, 1.8, 1.10	4, 5, 6, 8, 9, 10
				2.1, 2.11, 2.12, 2.13, 2.15	A1, A11, A12, A13, A15
				3.1, 3.5, 3.10	C1, C5, C10, C13
				4.9, 4.10, 4.14	B9, B10, B14, B17
				5.1, 5.2, 5.3, 5.4, 5.5, 5.8, 5.9, 5.10	D1, D2, D3, D4, D5, D8, D9, D10

PO 906	Clinical Pharmacology	2	1	1.4, 1.5, 1.8, 1.10	4, 6, 8, 9
				2.1, 2.8, 2.11, 2.12, 2.13, 2.14	A1, A8, A11, A12, A13, A14
				3.5, 3.10	C5, C10, C13
				4.9, 4.10, 4.11	B9, B10, B11
				5.2, 5.8	D2, D8
HU 903	Sociology	1	-	1.8, 1.9, 1.10	6, 7, 8
				2.1, 2.21	A1, A20
				3.5, 3.10	C5, C10
				-----	-----
				5.1	D1

Semester (10)

Course Code	Course Title	Hours/week		NARS	Graduate attributes & Programme ILOs
		Lect.	Pract.		
PO 007	Therapeutics-2	2	1	1.4, 1.5, 1.7, 1.8, 1.10	4, 5, 6, 8, 9
				2.1, 2.6, 2.8, 2.11, 2.12, 2.13, 2.14	A1, A6, A8, A11, A12, A13, A14, A27, A28
				3.5, 3.10	C5, C10
				4.9, 4.10, 4.11	B9, B10, B11
				5.2, 5.5, 5.8, 5.10	D2, D5, D8, D10
PP 010	Treatment of Dermatological & Reproductive Diseases	1	1	1.4, 1.5, 1.7, 1.8, 1.9, 1.10	4, 5, 6, 7, 8, 9
				2.12, 2.13	A12, A13, A27
				3.1, 3.5, 3.9, 3.10	C1, C5, C9, C10, C13
				4.9, 4.11, 4.13, 4.14	B9, B11, B13, B14, B17
				5.1, 5.3, 5.6, 5.8, 5.9, 5.10	D1, D3, D6, D8, D9, D10
PP 011	Treatment of Pediatric Diseases	2	1	1.4, 1.5, 1.7, 1.8, 1.9, 1.10	4, 5, 6, 7, 8, 9
				2.12, 2.13	A12, A13, A27
				3.1, 3.5, 3.9, 3.10	C1, C5, C9, C10, C13
				4.9, 4.10, 4.11, 4.13, 4.14	B9, B10, B11, B13, B14, B17
				5.1, 5.3, 5.6, 5.8, 5.9, 5.10	D1, D3, D6, D8, D9, D10
PP 012	Treatment of Cardiovascular Diseases	2	1	1.4, 1.5, 1.7, 1.8, 1.9, 1.10	4, 5, 6, 7, 8, 9
				2.12, 2.13	A12, A13, A27
				3.1, 3.5, 3.9, 3.10	C1, C5, C9, C10, C13
				4.9, 4.11, 4.13, 4.14	B9, B11, B13, B14, B17
				5.1, 5.3, 5.6, 5.8, 5.9, 5.10	D1, D3, D6, D8, D9, D10
PP 013	Gastroenterology	2	1	1.4, 1.5, 1.7, 1.8, 1.9, 1.10	4, 5, 6, 7, 8, 9
				2.12, 2.13	A12, A13, A27
				3.1, 3.5, 3.9, 3.10	C1, C5, C9, C10, C13
				4.9, 4.11, 4.13, 4.14	B9, B11, B13, B14, B17
				5.1, 5.3, 5.6, 5.8, 5.9, 5.10	D1, D3, D6, D8, D9, D10

PP 014	Treatment of Respiratory System Diseases	2	1	1.4, 1.5, 1.7, 1.8, 1.9, 1.10	4, 5, 6, 7, 8, 9
				2.9, 2.12, 2.13	A9, A12, A13, A27
				3.1, 3.5, 3.9, 3.10	C1, C5, C9, C10, C13
				4.9, 4.10, 4.11, 4.13, 4.14	B9, B10, B11, B13, B14, B17
				5.1, 5.3, 5.6, 5.8, 5.10	D1, D3, D6, D8, D10
PP 015	Drug Information	1	-	1.4, 1.5, 1.7, 1.8, 1.9, 1.10	4, 5, 6, 7, 8, 9
				2.17	A17, A28
				3.1, 3.10, 3.11	C1, C10, C11
				4.12, 4.13	B12, B13
				5.1, 5.2, 5.4, 5.6, 5.8, 5.10	D1, D2, D4, D6, D8, D10

Elective courses

Course Code	Course Title	Hours/week		NARS	Graduate attributes & Program ILOs
		Lect.	Pract.		
PCE 11	Drug Design	2	1	1.7, 1.8	5, 6
				2.5	A5
				3.1, 3.11	C1, C11
				4.6	B6
				5.1, 5.3, 5.4, 5.8, 5.9	D1, D3, D4, D8, D9
PCE 12	Advanced Pharmaceutical Analysis-Spectroscopy	2	1	1.6, 1.7, 1.8, 1.10	5, 6, 8, 10
				2.7	A7
				3.1, 3.2, 3.4, 3.8, 3.11	C1, C2, C4, C8, C11
				4.3, 4.5, 4.13, 4.14	B3, B5, B13, B14
				5.2, 5.3, 5.4, 5.9, 5.10	D2, D3, D4, D9, D10
POE 9	Veterinary Pharmacology	2	1	1.1, 1.4, 1.5, 1.6, 1.7, 1.9, 1.10	1, 4, 5, 7, 8, 9, 10
				2.1, 2.6, 2.8, 2.10, 2.12, 2.13, 2.14, 2.16	A1, A6, A8, A10, A12, A13, A14, A16, A26
				3.1, 3.5, 3.7, 3.9, 3.10, 3.11	C1, C5, C7, C9, C10, C11
				4.1, 4.8, 4.9, 4.10, 4.13, 4.14	B1, B8, B9, B10, B13, B14
				5.1, 5.2, 5.3, 5.5, 5.9	D1, D2, D3, D5, D9
PME 5	Biological Standardization	2	1	1.1, 1.3, 1.6, 1.7, 1.8, 1.9, 1.10	1, 3, 5, 6, 7, 8, 10, 11
				2.1, 2.3, 2.4, 2.7, 2.17	A1, A3, A4, A7, A17, A24
				3.1, 3.2, 3.4, 3.8, 3.11	C1, C2, C4, C8, C11
				4.2, 4.3, 4.5, 4.6, 4.7, 4.13, 4.14	B2, B3, B5, B6, B7, B13, B14
				5.1, 5.2, 5.3, 5.4, 5.6, 5.9, 5.10	D1, D2, D3, D4, D6, D9, D10

PME 6	Antimicrobial Agents	2	1	1.1, 1.4, 1.5, 1.6, 1.8, 1.9, 1.10	1, 4, 6, 7, 8, 9, 10
				2.1, 2.8, 2.11, 2.13, 2.16	A1, A8, A11, A13, A16, A23
				3.1, 3.2, 3.4, 3.5, 3.6, 3.7, 3.9, 3.10, 3.11	C1, C2, C4, C5, C6, C7, C9, C10, C11
				4.8, 4.10, 4.11, 4.13	B8, B10, B11, B13
				5.1, 5.2, 5.3, 5.5, 5.6	D1, D2, D3, D5, D6
PGE 8	Alternative Medicinal Therapies			1.1, 1.2, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10	1, 2, 4, 5, 6, 7, 8, 9, 10
				2.1, 2.2, 2.12, 2.13, 2.14, 2.15	A1, A2, A12, A13, A14, A15
				3.1, 3.5, 3.9, 3.10, 3.11	C1, C5, C9, C10, C11
				4.4, 4.9, 4.11	B4, B9, B11, B15
				5.1, 5.2, 5.3, 5.6, 5.10	D1, D2, D3, D6, D10
PGE 9	Production and Manufacture of Medicinal Plants			1.1, 1.2, 1.6, 1.7, 1.8, 1.9, 1.10	1, 2, 5, 6, 7, 8, 9, 10
				2.1,2.2,2.4,2.13, 2.14, 2.15, 2.20	A1, A2, A4, A13, A14, A15 A29
				3.1, 3.2, 3.3, 3.4, 3.9, 3.11, 3.12	C1, C2, C3, C4, C9, C11
				4.1, 4.3, 4.4, 4.5, 4.10, 4.13	B1, B3, B4, B5, B10, B13, B15
				5.1, 5.2, 5.5, 5.6,5.7,5.9, 5.10	D1, D2, D5, D6, D7, D9, D10
PGE 10	Chromatography and Separation Techniques	2	1	1.1, 1.3, 1.6, 1.7, 1.8, 1.10	1, 3, 5, 6, 8, 10, 11
				2.3, 2.4	A3, A4
				3.1, 3.4, 3.8, 3.11	C1, C4, C8, C11
				4.5, 4.13	B5, B13, B15
				5.3, 5.4, 5.5, 5.6, 5.8, 5.10	D3, D4, D5, D6, D8, D10

PTE 10	Quality Assurance and GMP	2	1	1.1, 1.2, 1.3, 1.6, 1.7, 1.8, 1.9, 1.10	1, 2, 3, 5, 6, 7, 8, 10, 11
				2.1, 2.3, 2.4, 2.7, 2.17	A1, A3, A4, A7, A17, A21
				3.1, 3.3, 3.6, 3.8, 3.11	C1, C3, C6, C8, C11
				4.1, 4.2, 4.3, 4.8	B1, B2, B3, B8
				5.1, 5.2, 5.3, 5.6, 5.7, 5.8, 5.9	D1, D2, D3, D6, D7, D8, D9
PTE 11	Applied Industrial Pharmacy	2	1	1.2, 1.6, 1.7, 1.8, 1.9, 1.10	2, 5, 6, 7, 8, 9, 10
				2.7	A7
				3.1, 3.3, 3.8, 3.11	C1, C3, C8, C11, C12
				4.1, 4.12	B1, B12
				5.1, 5.2, 5.3, 5.6, 5.7, 5.8, 5.9, 5.10	D1, D2, D3, D6, D7, D8, D9, D10
PTE 12	Good Manufacturing Practices	2	1	1.2, 1.3, 1.6, 1.7, 1.8, 1.9, 1.10	2, 3, 5, 6, 7, 8, 10, 11
				2.1, 2.3, 2.7, 2.17	A1, A3, A7, A17, A25
				3.1, 3.3, 3.6, 3.8, 3.11	C1, C3, C6, C8, C11, C12
				4.1, 4.2, 4.3, 4.8	B1, B2, B3, B8
				5.1, 5.2, 5.3, 5.6, 5.7, 5.8, 5.9, 5.10	D1, D2, D3, D6, D7, D8, D9, D10
PTE 13	Cosmetic Preparations	2	1	1.1, 1.2, 1.6, 1.8, 1.9, 1.10	1, 2, 6, 7, 8, 10
				2.1, 2.2, 2.6, 2.21	A1, A2, A6, A20, A27
				3.1, 3.2, 3.8, 3.11, 3.12	C1, C2, C8, C11
				4.1, 4.3	B1, B3
				5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.8, 5.9, 5.10	D1, D2, D3, D4, D5, D6, D8, D9, D10

Summer Training (graduation requirement)

Every student should complete at least (100 hours) of training in pharmacy settings such as community pharmacies, pharmaceutical firms. A further at least (100 hours) of clinical training in a teaching hospital are required. Students commence their training during the summer vacation preceding the 3rd, 4th, or 5th year of study.

Table (7): Comparison between NARS & Graduate attributes achieved in summer training this part is missing from the ILO's

NARS	Graduate Attribute
1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

Table (8): Comparison between NARS & Clinical Pharmacy program ILOs-achieved in Summer Training

NARS	Programme ILOs
2.1, 2.2, 2.6, 2.8, 2.9, 2.10, 2.13, 2.14, 2.17, 2.18, 2.20, 2.21 (2.16, 2.15)	A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13.
3.1, 3.2, 3.5, 3.6, 3.9, 3.10, 3.11, 3.12 (3.3, 3.7)	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10
4.1, 4.4, 4.9, 4.10, 4.13, 4.14 (4.11, 4.12)	B1, B2, B3, B4, B5, B6, B7
5.1, 5.2, 5.3, 5.4, 5.5, 5.9, 5.10	D1, D2, D3, D4

7- Program admission requirements

- The Faculty of Pharmacy, Alexandria University complies with the admission regulation and requirements of the Egyptian Supreme Council of Universities (ESCU).
- General secondary school certificate with major in biology and chemistry, or an equivalent certificate from a foreign institute recognized by the university allowed applying for the course.
- Admission exam organized by the faculty.
- Courses completed at another faculty are evaluated for equivalency to the Faculty of Pharmacy, Alexandria University courses.

a. Transfer Admission Requirement

- Transfer students must fulfill the faculty of Pharmacy admission requirement.
- Courses completed at another faculty are evaluated for equivalency to the Faculty of Pharmacy, Alexandria University course.

b. Courses Registration

- Academic advisors are available to help students select the required and suitable courses from the list of the offered courses. Selection of the courses for any given year is conditional on the successful completion of the prerequisite course of the preceding academic year.

c. Courses Load

The course load is the number of registered credit hours per student each semester.

- The academic load in each semester ranges from 12-22 credit hours.
- The academic load in the summer semester ranges from 4 to 10 credit hours.
- Credits acquired by the student are those of passed courses from the registered academic load.

d. Add, Drop and Withdrawal

Students are allowed to add or drop a course or more during specified time every semester. Students are allowed to withdraw from a course prior to specified deadline set by the University. The course will carry a grade "W" and students will be allowed to retake the course when available. Students who withdraw after the deadline will not be allowed to sit for the relevant exam and will carry grade "F" for that course.

e. Attendance

Students are expected to attend the university on a full-time basis during each semester. Attendance is checked during seminars, tutorial and lab. Student must attend at least 75% of the tutorials and practical labs to be allowed to submit the final exams. If absence in a course exceeded the allowed percentage (25%) the student will not be allowed to sit for the exam of the relevant subject and will carry grade "F".

8- Regulations for progression and program completion

Failure to pass courses:

A student fails course when:

- He is absent for the final exam.
- He got less than 30% of the final written exam.
- He did not get at least 60% of the total course grade.

If a student failed a required course in any semester, he should repeat the course and pass it.

If a student failed an elective course, he can repeat the same course or pass an alternative elective course to finish his requirements for graduation, following the approval of the academic supervisor and the Faculty Dean.

Academic failure:

- A student who gets a CGPA less than 1 for 6 consecutive semesters or 10 non-consecutive semesters is dismissed from the Faculty.
- A student is allowed to repeat the courses in which he received D to improve the CGPA. The higher grade is the one included in the calculation of his CGPA,

Suspension of enrollment:

- A student who doesn't register for courses or withdraw from all courses in any given semester with or without an excuse is considered "suspended from enrollment".
- A student may voluntarily suspend his academic work for 2 consecutive or 3 non-consecutive semesters with the approval of the Faculty board & is dismissed in case of suspension for longer periods without an excuse accepted by the Faculty board and the University President.

Requirements for Bachelor's degree:

The requirements for Bachelor's degree in pharmaceutical sciences (clinical pharmacy) include the following:

A- Study for 197 credit hours distributed on 10 semesters and divided as:

1. The University requirements: 9 credit hours.
2. The compulsory Faculty requirements: 182 credit hours (courses schedule).
3. The elective Faculty requirements: 6 credit hours.

B- Practical training for no less than 200 training hrs (100 credit hours) under the supervision of an academic staff member in a community or private pharmacy or a pharmaceutical company approved by the Faculty board, in addition to 100 credit hours of clinical training in a university hospital.

Students' discipline:

Students registered for the program should submit to the disciplinary system listed in the Egyptian Universities Organization Law number 49 for the year 1972 and all complementary laws.

9. Methods and Regulation for program applicant's assessment

Student's performance is assessed by both coursework and examinations. Exams are held at the end of each course. Methods of assessment include written, oral and practical examinations, research papers, course assignments and practical work.

Table (9): Method of assessment

Method of assessment		Intended learning outcomes (ILOs)
1	Written examination	Knowledge and understanding Intellectual
2	Practical examination	Knowledge and understanding Intellectual Professional and practical
3	Oral examination	Knowledge and understanding Intellectual Professional and Transferable
4	Others (posters, field visit, presentation, projects,... etc.	Intellectual Transferable and General

Table (10): Grading Scheme

Grade Expression	Grade Scale	Grade point Average (GPA)	Numerical Scale Marks
Excellent	A	4	≥ 90%
	A-	3.7	85 - < 90%
Very Good	B+	3.3	80 - < 85%
	B	3	75 - 80%
	B-	2.7	72.5 - < 75%
Good	C+	2.3	70 - < 72.5%
	C	2	67.5 - < 70%
	C-	1.7	65 - < 67.5%
Fair	D+	1.3	62.5 - < 65%
	D	1	60 - < 62.5%
Fail	F	0	< 60%

Table (11): Program Evaluation:

	The Evaluator	Tool	Samples
1	Senior students	Questionnaire, brain storming	10%
2	Graduates	Questionnaire	10%
3	Stakeholders	Questionnaire and focus group	20
4	External Examiner (s)	Questionnaire	20 / year
5	External evaluator for program & courses	Site visit, document examination	One for each department and one for the program
6	Internal audit	Site visit, document examination	One internal evaluator
7	Others	Peer-reviewer visits	13/5/2013 29/3/2015

Program coordinator
Heba Hassan Abdin
Professor of Pharmaceutical
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Amira M. Senbel
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Dean of the Faculty
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