Faculty of Pharmacy

Bachelor in Pharmacy

(Modified and unified bylaw

Clinical Pharmacy Program)

Ministerial Decision No (3251)

Ministry Approval Date: 13/8/2018

Program Specifications

Faculty Council Approval Date: 25/11/2020

Last Faculty Council Approval Date: 20/9/2023

Approved after external evaluation

Program approval acc. To NARS 2017

Modified and unified bylaw Clinical Pharmacy Program Specifications

Bachelor of Pharmacy (Clinical Pharmacy)

University: Mansoura

Faculty: Pharmacy

A- Basic Information

1. **Program title:** Bachelor of Pharmacy (Modified and unified bylaw Clinical Pharmacy)
2. **Program type:** Single
3. **Departments:**
    - Pharmaceutics (PT)
    - Pharmacognosy (PG)
    - Pharmacy Practice(PP)
    - Pharmacology and Toxicology (PO)
    - Microbiology and Immunology (PM)
    - Pharmaceutical Analytical Chemistry (PC)
    - Pharmaceutical Organic Chemistry (PC)
    - Medicinal Chemistry (PC)
    - Biochemistry (PB)
4. **Duration of the program**:5 years
5. **Language of study**: English
6. **Program Coordinator:** Clinical Pharmacy program's director
7. **Last Faculty Program approval date according to NARS 2017: 20 / 9 / 2023**

B- Professional Information

1: Program Aims:

Mansoura University awards Bachelor of Pharmacy (Clinical Pharmacy) degree following a five-year undergraduate Pharmacy program. This Pharmacy program provides students with the necessary knowledge and skills in basic, pharmaceutical, medical, social, behavioural, health, environmental sciences, clinical pharmacy and pharmacy practice and management; aiming to graduate competent general practitioner pharmacists; capable of working effectively in different settings, including community pharmacies, hospitals, forensic and biomedical laboratories, governmental health institutions, pharmaceutical industries, academia and research centres. Graduates are talented to:

1. Fulfill the needs of the local and regional market, and bear responsibilities at work place, in compliance with the pharmacy laws and legislations, and with the ethical and professional rules and the community values.
2. Handle safely and prudently chemicals and pharmaceutical products and participate in systems for prescribing, dispensing, storing and distribution of medications.
3. Practice effectively the good manufacturing, good laboratory, and good safety principles to assure the quality of raw materials, procedures and pharmaceutical products.
4. Deliver patient care in hospital and community pharmacies; and promote rational, safe and effective use of medication in pharmacy practice settings.
5. Collaborate actively with other health care professionals in health education of the public, and in prevention and management of diseases, by providing drug information and preventive health care systems to the community.
6. Perform research at competitive level, using appropriate evidence-based methodologies, and in compliance with the academic standards.
7. Develop presentation, marketing, promotion, business administration and information technology skills.
8. Conduct effective communication, time management, critical thinking, problem

solving, decision-making, team-working, performance appraisal and self-assessment.

9. Commit to educate and train the upcoming generation of pharmacists, and to assure and improve the quality of health care of the society.

10 Oblige to life-long learning for continuous professional improvement.

2- Competencies of the Pharmacy Graduates:

Four **Competency Domains** are included in the competency-based National Academic Reference Standards for Pharmacy Education. These domains are designed to cover all essentials for practicing pharmacy profession including both drug-oriented and patient oriented disciplines. Each domain should be achieved through a number of **Competencies** which are overall broad statements that cover various areas of the graduate performance. A number of **Key Elements** are included in each competency. These key elements demonstrate how pharmacy graduate will reflect each competency in practice. The competency domains are the followings:

Domain 1: Fundamental Knowledge

Domain 2: Professional and Ethical Practice

Domain 3: Pharmaceutical Care

Domain 4: Personal Practice

3 - Program Learning Outcomes:

The Faculty of Pharmacy-Mansoura University, adopts the National Academic Reference Standards in Pharmacy education, issued by National Authority for Quality Assurance and Accreditation of Education (NAQAAE) 2nd Edition in April 2017.

DOMAIN 1 - FUNDAMENTAL KNOWLEDGE

1 -1 – COMPETENCY: Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centered care.

- **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 bio-pharmaceutics 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 pharmaco-therapeutic 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 withprofessional 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.

4- Academic Reference Standards:

4-a: External Reference for standards (NARS):

The Faculty of Pharmacy-Mansoura University, adopts the National Academic Reference Standards in Pharmacy education, issued by National Authority for Quality Assurance and Accreditation of Education (NAQAAE) 2nd Edition in April 2017.

4b- Comparison of clinical pharmacy program Aims to graduate attributes (NARS) **(Attachment #1).**

4c- The program Learning outcomes is the National Academic Reference Standards NARS (2nd Edition in April 2017).

5- Curriculum Structure and Contents:

5-a Program duration: 5 years.

5-b Program structure: 184 hours

5b.i	**No. of hrs per week**	Lectures	128	Lab./Exercise	56	Total	184
5b.ii	**Practical/Field Training:**		**100** hours of clinical training in hospital settings and specialized Mansoura University Medical Centers **200** hours summer training in pharmaceutical settings; including pharmacies and pharmaceutical companies				

6- Program's Courses:

To obtain a bachelor's degree in pharmacy (Clinical Pharmacy), the student is required to study 195 credit hours. The Faculty has issued a study plan, where courses are distributed over ten semesters (five levels). The following two tables illustrate the distribution of credit hours and courses on the different requirements and academic levels. A detailed distribution of the courses, along with their credit hours, prerequisites, exam marks and exam time is included (**Attachment # 2**).

	Credit Hours
University Requirements	4
Faculty Compulsory courses	174
Faculty Elective Courses	6
Practical/Field Training: (300 hours)	100 hours of clinical training in hospital settings and specialized Mansoura University Centers under academic supervision 200 hours summer training in pharmaceutical settings; including pharmacies and pharmaceutical companies approved by Faculty's Council Under supervision of Staff Members
Total	184 credit hours

Program course Levels (in credit-hours system):

Level	Semester	Lectures	Practical	Total
1	1	12	5	17
	2	12	5	17
2	3	11	4	15
	4	12	6	18
3	5	13	5	18
	6	14	6	20
4	7	15	6	21
	8	14	6	20
5	9	12	6	18
	10	13	7	20
Total		128	56	184

Matrix of the courses with the program K-elements (NARS K-elements) is included. (Attachment # 3).

Curriculum Contents:

Courses' Description are included **(Attachment # 4)**, and course's specification are reviewed and approved by Faculty of Pharmacy's Council and are available at both program administration and Quality Assurance Unit – Faculty of Pharmacy – Mansoura University.

Clinical training schedule are announced per semester after approval of the higher committee of the program and is offered for level 4 students. Clinical training is held after coordination with the specialized medical centers and hospitals, Mansoura University.

Students are arranged into small groups (10-15 students and each groups has 2 supervisors from Faculty of Pharmacy and Faculty of Medicine Mansoura University.

Partners in clinical training include but not limited to: Mansoura General University Hospital, Mansoura Oncology Center, Emergency Hospital, Pediatrics Hospitals, Nephrology and Urology Center, Gastroenterology Hospital - Mansoura University and Mansoura New General Hospital.

7- Teaching and Learning methods:

1.	Developed lecture	المحاضرة المطورة
2.	Practical work and tutorials	التجارب العملية والتمارين
3.	Hybrid learning	التعليم الهجين
4.	Collaborative learning	التعلم التعاوني
5.	Self-learning	التعلم الذاتي
6.	Simulation based learning	التعليم القائم على المحاكاة
7.	Problem – based learning	التعلم بطريقة حل المشكلات
8.	Case study	دراسة الحالة
9.	Presentation	العروض التقديمية

10.	Computer aided learning	التعلم بمساعدة تكنولوجيا المعلومات
11.	Reciprocal learning	التدريس التبادلي
12.	Demos	العروض التقديمية

Matrix of the teaching and learning methods with the Program Key-elements is included (**Attachment # 5)**

8- Student Assessment:

- Methods of assessments include semester, final written oral and practical examination. Research paper, course assignments, presentation are examples of self-learning tools adopted to promote quality of learning and to implement unconventional learning tolls besides library exercise and practical work.
- Midterm exam is held after the 6^{th} – 8^{th} week of each semester
- Practical exams are at the 12^{th} – 14^{th} week and can be modified according to the academic year plan of higher education ministry.
- Final written and oral exams started from 15^{th} week of the semester and can be modified according to the academic year plan of higher education ministry.

Matrix of the assessment methods with the Program Key-elements is included (**Attachment # 5)**

- Each course is assigned a total of 100 points (marks); 71 courses besides human right course

Courses	No. of courses	Percentage	Midterm exam marks	Practical exam marks	Oral exam marks	Written exam marks	Total marks
Courses with midterm, practical, oral and written exams	**50**	**69.4%**	**10**	**25**	**15**	**50**	**100**
Courses with midterm, oral and written exams	**6**	**8.3%**	**20**	**--**	**15**	**65**	**100**

Courses with midterm and written exams	**10**	**13.8 %**	**25**	**--**	**--**	**75**	**100**
Courses with midterm, practical and written exams	**3**	**4.1%**	**10**	**25**	**--**	**65**	**100**
Courses with practical and written exams	**3**	**4.1%**	**--**	**25**	**--**	**75**	**100**
	72	**100 %**					

- Performance of a student is measured by the **Grade point average (GPA) value** he/she scores in an individual course **(Attachment 6).**
- Student assessment methods help to evaluate the Key elements of each course.

9- Program Admission Requirements:

- The Faculty complies with the admission regulations and requirements of the Egyptian Supreme Council of Universities (SCU).
- Nominated students must hold the Egyptian high school general certificate (Scientific Section), or an equivalent certificate accepted by the SCU.
- Foreign students are nominated for admission to the faculty according to the general regulations of the Ministry of Higher Education.
- Students from other governmental Egyptian universities or foreign scientific institutes recognized by the Supreme Council of Universities must fulfill the faculty of pharmacy admission requirements and internal regulations before being transferred to our Faculty.
- All Students must fulfill all requirements and comply with the rules of admission to the Faculty.
- Full-time study is mandatory for all students.
- 10% of the newly admitted students to level 1 at Faculty of Pharmacy are allowed to join the program so that the total number of the students joining the program in its

different academic levels does not exceed 20% of the total number of students in the different academic levels in the regular program.

- The Program's administration board proposes the number of the yearly accepted students and the proposed number is officiated and approved by the Faculty of Pharmacy Council. A number of seats is reserved for students holding equivalent certificates, American Diplome (SAT) and British diplome (GRE) according to the regulation of Ministry of Higher Education.
- Students holding equivalent degrees are offered places based on the proportion applying holding each degree.
- Whenever the number of students exceeds the pre-approved numbers, criteria of selection are applied including:
  1- The score of high school general certificate
  2- Whenever students achieve the same score, marks in both biology and chemistry are added to the total score and students are arranged.
  3- Whenever students achieve the same score after inclusion of biology and chemistry, English marks are added to the score and students are arranged.
- For students who acquired an equivalent certificate issued from other foreign countries approved by the Ministry of Higher Education, an English exam is held to arrange the students according to their scores in English exam.
- Students holding SAT and GRE degrees are approved for admission after arranging them according to scores obtained in the certificate exam.
- STEM students are allowed to join the program as separate entity.

10- Regulations for progression and Bachelor of Pharmacy (Modified and unified bylaw Clinical Pharmacy) program completion:

- The Faculty adopts the Credit Hour System in this program.
- Student registers the courses in each semester with the guidance and approval of his/her

academic advisor, taking into consideration the prerequisite of each course and extent of academic progress of the students.

- Groups of students in academic supervision for each academic advisor range from (25-30 students).
- Each student is allowed to register a total of 12 to 22 credit hours in each semester; while the academic load during summer semester is 4 – 10 credit hours.
- Students who achieve CGPA less than 1 for successive 6 semesters or separate 10 semesters are exempted from the faculty after Faculty council approval. Students with such problems are given academic alerts regularly
- Students who exceed the aforementioned limits are allowed one final; chance to adjust their cGPA before being exempted after approval of the higher committee of the program.
- Students achieving GPA less than 1 are not allowed to register more than 12 credit hours of the previously studied courses.
- Students achieving GPA (1-1.5) are allowed to register 15 credit hours.
- Students in the fifth academic year are allowed to register an overload of credit hours, not exceeding 4 credit hours divided on both graduation semesters after approval of his/her academic advisor and higher committee of the program and the student is required to successfully pass 149 credit hours to be qualified for overload registeration. The student is not allowed to register the second overload course unless he passes the first overload.
- Students must attend not less than 75 % of the lectures and lab. Sessions. Otherwise, they would not be able to attend the final exam and complete the course.
- Progression into a higher level requires that the student should successfully complete around 20 % of the total credit hours.

Academic Level	Number of credit hours exceeded
Level 1	0 - 34 credit hours
Level 2	34 - 67 credit hours
Level 3	67 - 105 credit hours

Level 4	105 - 146 credit hours
Level 5	146 - 184 credit hours

- Completion of the program requires that the student must successfully complete 184 credit hours, in addition to acquiring 200 hours of summer training in a pharmaceutical establishment/setting or equivalent (community or hospital pharmacies, pharmaceutical firms or research institutes and universities) and 100 hours clinical training in s a specialized clinical training setting.
- Student transferred from other institutions must study at Mansoura University at least 60% of graduation requirements.
- Grading of the Human Rights and English courses are not included in the cumulative GPA (cGPA).

12-Evaluation of Program Learning Outcomes

1- Annual review of the Program's report.
2- Feedback of stakeholders.
3- Feedback of clinical trainers and participants in teaching staff from other faculties.
4- Feedback of students and graduates.
5- Reports of reviews of internal and external evaluators.
6- Reports of annual review boards and committees.

Program Director: professor Marwa Salah El-din El-Dahan

Signature: Marwa Salah

Last Faculty Council Approval Date according to NARS 2017: 20 /9/2023

Attachment # 1

A. Comparison of Program Aims to Graduate Attributes

Program Aims	Graduate Attributes (NARS)
1. Fulfill the needs of the local and regional market, and bear responsibilities at work place, in compliance with the pharmacy laws and legislations, and with the ethical and professional rules and the community values.	1.1 Educate and counsel individuals and communities to participate in optimizing therapeutic outcomes and minimizing the incidence of illness of individuals and populations.
2. Handle safely and prudently chemicals and pharmaceutical products and participate in systems for dispensing, storing and distribution of medications.	1.2 Practice and perform responsibilities and authorities legally, professionally, and ethically respecting patients' rights.
3. Practice effectively the good manufacturing, good laboratory, and good safety principles to assure the quality of raw materials, procedures and pharmaceutical products.	1.3 Utilize evidence-based data to deliver contemporary pharmaceutical products and pharmacy services.
4. Deliver patient care in hospital and community pharmacies; and promote rational, safe and effective use of medication and medical devices in pharmacy practice settings.	1.4 Assure the quality of pharmaceutical materials and products.
5. Collaborate actively with other health care professionals in health education of the public, and in prevention and management of diseases, by providing drug information and preventive health care systems to the community.	1.5 Apply integrated evidence-based pharmaceutical and clinical information in assessing the appropriateness, effectiveness, and safety of medications.
6. Perform research at competitive level, using appropriate evidence-based methodologies, and in compliance with the academic standards.	1.6 Contribute effectively in planning and conducting research using appropriate methodologies.

7. Develop presentation, marketing, promotion, business administration and information technology skills.	1.7 Work collaboratively and share therapeutic decision-making as a member of an inter-professional health care team.
8. Conduct effective communication, time management, critical thinking, problem solving, decision-making, team-working, performance appraisal and self-assessment.	1.8 Demonstrate effective communication, leadership, business administration, and entrepreneurial skills.
9. Commit to educate and train the upcoming generation of pharmacists, and to assure and improve the quality of health care of the society.	1.9. Work as a life-long learner for continuous professional improvement and demonstrate capabilities of performance appraisal and self-assessment.
10. Oblige to life-long learning for continuous professional improvement.	

Attachment # 2

Detailed Courses distribution into 10 semesters

PROGRAMME CURRICULUM

Semester (1)

Course Title	Course	Credit hours			Prerequisite	Examination Marks*				Total. marks	Final Exam. (hrs)
		Lect.	Pract	Total		Period	Pract.	Wr.	Oral		
Physical & Inorganic Chemistry	PC 101	2	1	3	**Registration**	10	25	50	15	100	2
Pharmaceutical Organic chemistry -I	PC102	2	1	3	**Registration**	10	25	50	15	100	2
Biophysics	MD101	1	1	2	**Registration**	10	25	65	-	100	1
Botany and medicinal plants	PG 101	2	1	3	**Registration**	10	25	50	15	100	2
Cell Biology	MD 102	1	1	2	**Registration**	10	25	50	15	100	1
Mathematics and statistics	MS 101	2	-	2	**Registration**	25	-	75	-	100	2
English language	EN 101	2	-	2	**Registration**	25	-	75	-	100	
Total		12	5	17						600	

Semester (2)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks*				Total. marks	Final Exam. (hrs)
		Lect.	Pract	Total		Period	Pract.	Wr.	Oral		
Pharmaceutical Organic chemistry-II	PC 203	2	1	3	Pharmaceutical organic chemistry -1	10	25	50	15	100	2
Pharmaceutical Analytical chemistry-I	PC 205	2	1	3	Physical & Inorganic Chemistry	10	25	50	15	100	2
Pharmacognosy -I	PG 202	2	1	3	Botany and medicinal plants	10	25	50	15	100	2
Histology	MD 203	1	1	2	Registration	10	25	65	-	100	1
Physical pharmacy	PT 201	2	1	3	Registration	10	25	50	15	100	2
Pharmacy orientation	PT 202	1	-	1	**Registration**	25	-	75	-	100	1
Human rights and Fighting corruption*	HU 201	2	-	2	**Registration**	25	-	75	-	100	2
Total		12	5	17						700	

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	PC 304	2	1	3	Pharmaceutical organic chemistry-I	10	25	50	15	100	2
Pharmaceutical Analytical chemistry-II	PC 306	2	1	3	Pharmaceutica analytical chemistry- I	10	25	50	15	100	2
Pharmacognosy -II	PG 303	2	1	3	Botany and medicinal plant	10	25	50	15	100	2
Anatomy	MD 304	1	---	1	Registration	25	--	75	-	100	1
Physiology	MD 305	2	1	3	Registration	10	25	65	-	100	2
Medical Terminology	MD311	2	-	2	Registration	25	-	75	-	100	2
Total		11	4	15						600	

Semester (4)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks*				Total. marks	Final Exam. (hrs)
		Lect.	Pract	Total		Period	Pract.	Wr.	Oral		
Biochemistry -I	PB 401	2	1	3	**Registration**	10	25	50	15	100	2
Phytochemistry -I	PG 404	2	1	3	Pharmacogosy-I	10	25	50	15	100	2
Instrumental Analysis	PC 407	1	1	2	**Registration**	10	25	50	15	100	1
General Microbiology Immunology	PM 401	3	1	4	**Registration**	10	25	50	15	100	3
Parasitology	MD 406	1	1	2	**Registration**	10	25	50	15	100	1
Pharmaceutical do forms-I	PT 403	2	1	3	Physical pharmacy	10	25	50	15	100	2
Pharmacy legislation	PT 404	1	-	1	Registration	25	-	75	-	100	1
Total		12	6	18							

Semester (5)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks*				Total. marks	Final Exam. (hrs)
		Lect.	Pract	Total		Period	Pract.	Wr.	Oral		
Pharmacology-I	PO 501	2	1	3	Physiology	10	25	50	15	100	2
Pharmaceutical microbiology	PM 502	2	1	3	**Registration**	10	25	50	15	100	2
Pharmaceutical dosage forms-II	PT 505	2	1	3	Physical pharmacy	10	25	50	15	100	2
Biochemistry-II	PB 502	2	1	3	Biochemistry -I	10	25	50	15	100	2
Phytochemistry-II	PG 505	2	1	3	Phytochemistry -I	10	25	50	15	100	2
Pathophysiology	MD 507	2	-	2	Physiology	20	-	65	15	100	2
Pharmacy Administration	PT 506	1	-	1	**Registration**	25	-	75	-	100	1
Total		13	5	18						700	

Semester (6)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks*				Total. marks	Final Exam. (hrs)
		Lect.	Pract	Total		Period	Pract.	Wr.	Oral		
Pharmacology-II	PO 602	2	1	3	Pharmacology-I	10	25	50	15	100	2
Pharmaceutical technology	PT 607	2	1	3	Pharmaceutical dosage forms-I	10	25	50	15	100	2
Community pharmacy practice	PP 601	2	1	3	Pharmacology-I	10	25	50	15	100	2
Pharmaceuticals analysis and quality control	PC 608	2	1	3	Pharmaceutical Analytical chemistry-II	10	25	50	15	100	2
Quality Control of Herbal Drugs	PG 606	2	1	3	Phytochemistry-II	10	25	50	15	100	2
Pathology	MD 608	2	1	3	Histology	10	25	50	15	100	2
First Aid	MD 609	2	-	2	Registration	20	-	65	15	100	2
Total		14	6	20						700	

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-I	PC 709	2	1	3	Pharmaceutical Organic chemistry-II	10	25	50	15	100	2
Radiopharmaceuticals	PT 708	1	-	1	**Registration**	25	-	75	-	100	1
Clinical pharmacy -I	PP 702	2	1	3	Pharmacology-I	10	25	50	15	100	2
Hospital pharmacy	PP 703	2	1	3	**Registration**	10	25	50	15	100	2
Controlled drug delivery system	PT 710	2	-	2	Pharmaceutical dosage forms-II	20	-	65	15	100	2
Clinical microbiology	PM 704	2	1	3	General Microbiology and Immunology	10	25	50	15	100	2
Pharmaceutical Biotechnology	PM 703	2	1	3	General Microbiology and Immunology	10	25	50	15	100	2
Pharmacology-III	PO 703	2	1	3	Pharmacology-I	10	25	50	15	100	2
Total		15	6	21						800	

Semester (8)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks*				Total. marks	Final Exam. (hrs)
		Lect.	Pract	Total		Period	Pract.	Wr.	Oral		
Medicinal chemistry-II	PC 810	2	1	3	Pharmaceutical Organic chemistry II	10	25	50	15	100	2
Clinical pharmacy -II	PP 805	2	1	3	Clinical pharmacy-I	10	25	50	15	100	2
Management of Oncological Disease	PP 805	2	1	3	Pathology	10	25	50	15	100	2
Biopharmaceutics and pharmacokinetics	PT 809	2	1	3	Pharmaceutical dosage forms-I	10	25	50	15	100	2
Clinical biochemistry	PB 803	2	1	3	Biochemistry-II	10	25	50	15	100	2
Drug marketing	PP 806	1	-	1	**Registration**	25	-	75	-	100	1
Public health and preve medicine	MD 810	2	-	2	Clinical microbiology	20	-	65	15	100	2
Elective course	PE	1	1	2	**Registration**	25		75	---	100	1
Total		14	6	20						800	

Semester (9)

Course Title	Course c	Credit hours			Prerequisite	Examination Marks*				Total. marks	Final Exam. (hrs)
		Lect.	Pract	Total		Period	Pract.	Wr.	Oral		
Toxicology and forensic chemistry	PO 904	2	1	3	Pharmacology III	10	25	50	15	100	2
Therapeutics -I	PO 905	2	1	3	Pharmacology-	10	25	50	15	100	2
Clinical pharmacokinetics	PP 907	2	1	3	Biopharmaceutics and pharmacokinetics	10	25	50	15	100	2
Phytotherapy	PG 907	2	1	3	Phytochemistry-II	10	25	50	15	100	2
Clinical nutrition	PP 904	1	1	2	Biochemistry-II	10	25	50	15	100	1
Drug interactions	PO 906	2	--	2	Pharmacology III	20	---	65	15	100	2
Elective course	PE	1	1	2	**Registration**	25		75	--	100	1
Total		12	6	18						700	

Semester (10)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks*				Total. marks	Final Exam. (hrs)
		Lect.	Pract	Total		Period	Pract.	Wr.	Oral		
Therapeutics -II	PO 007	2	1	3	Pharmacology -III	10	25	50	15	100	2
Management of dermatological and reprodu diseases	PP 008	1	1	2	Pathology	10	25	50	15	100	1
Management of Pediatrics diseases	PP 009	2	1	3	Pathophysiology & pharmacology-III	10	25	50	15	100	2
Management of Cardiovascular diseases	PP 010	2	1	3	Pathophysiology & pharmacology-II	10	25	50	15	100	2
Management of Gastrointestinal diseases	PP 011	2	1	3	Pathophysiology & pharmacology-II	10	25	50	15	100	2
Management of Respiratory system diseases	PP 012	2	1	3	Pathophysiology & pharmacology-I	10	25	50	15	100	2
Drug information	PP 013	1	-	1	**Registration**	20	-	65	15	100	1
Elective course	PE	1	1	2	**Registration**	25		75	--	100	1
Total		13	7	20						800	

Attachment # 3

Matrix of Courses versus Program k-elements (NARS)

Matrix of the courses with the Program k-elements (NARS k-elements) is provided as supplementary excel sheet**.**

Attachment # 4

Courses Description

PC 101 Physical and Inorganic Chemistry
Matter; its properties and measurement, electromagnetic spectrum, atomic structure, chemical bonding and intermolecular forces. Gases, liquids, and solids. Man and his environment and nuclear chemistry.

PC 102 Pharmaceutical Organic Chemistry (1)
Nature of organic compounds and structures. Nomenclature, aliphatic (saturated and unsaturated) hydrocarbons. Organic reactions (substitutions, additions, eliminations and condensations). Chemistry of the different organic classes: halogenated hydrocarbons, alcohols, ethers, carbonyl compounds, mono- and dibasic carboxylic acids and derivatives, amino acids.

PC 203 Pharmaceutical Organic Chemistry (2)
Chemistry of aromatic organic compounds including aromatic hydrocarbons, halogen and nitro derivatives, amines and diazonium salts, phenols, aromatic carboxylic acids, aromatic aldehydes, aromatic ketones , sulfonic acids and polynuclear aromatic hydrocarbons. Introduction to use of spectroscopic methods in organic chemistry (UV, IR, MS, NMR).

PC 304 Pharmaceutical Organic Chemistry (3)
Stereochemistry and Stereoisomerism. Organic reaction mechanisms (substitutions, additions, eliminations and condensations). Heterocyclic compounds including monocyclic monoheteroatom and fused bicyclic compounds.

PC 205 Pharmaceutical Analytical Chemistry (1)
Quantitative analytical chemistry comprises; acid base titrations and buffer solution, precipitimetry and gravimetry.

PC 306 Pharmaceutical Analytical Chemistry (2)
An introduction to statistical analysis, Oxidation-reduction titrations,(electrical properties of redox systems, factors affecting oxidation potential, redox titration curves). Complexometry (importance complexones stability titration curves, application, direct EDTA titrations, masking and demasking, non EDTA titrations)

PC 407 Instrumental Analysis
Spectrophotometric methods of analysis including; ultra-violet, visible and flame photometry, spectrofluorometry, atomic absorption & flame, electrochemistry (potentiometry, conductimetry, polarography), chromatography.

PC 808 Pharmaceutical Analysis and Quality Control
Control and quality assurance, in process control and validation, sampling process prior to analysis, analysis of raw materials and finished products using reference standards, pharmacopeial methods of stability and stability testing of drugs, performance and calibration of instruments used in pharmaceutical analysis, validation of analytical methods and ISO and BSI

PC 609 Medicinal Chemistry (1)
Introduction to pharmaceutical and medicinal chemistry, physicochemical properties of drugs in relation to biological action, chemotherapeutic agents, synthetic antimicrobial agents, malaria chemotherapy, antibacterial antibiotics and cancer chemotherapy.

PC 810 Medicinal Chemistry (2)
Central nervous system depressants, central nervous system stimulants, cardiovascular agents, analgesic agents, steroids and related compounds.

PC E11 Drug Design
Structure activity relationships, quantum mechanical approaches, molecular connectivity, pharmacophore generation, molecular modification by isosteric replacement. Natural products leading to new pharmaceuticals, mathematical treatment serving prediction, defining sites and targets, molecular modeling, prodrugs and drug latentiation.

PC E12 Advanced Pharmaceutical Analysis -Spectroscopy
Applications of instrumental methods of analysis (ultraviolet and infrared spectroscopy; NMR; mass spectrometry; atomic absorption spectroscopy) to pharmaceutical compounds.

PG 101 Botany and Medicinal Plants
Plant Kingdom; classification and systematic botany of some lower and higher plants with examples of medically active plants; Cytology, morphology and anatomy of different plant organs, plant physiology. A general introduction of medicinal plants (cultivation, collection, drying, packing, storage, and adulteration)

PG 202 Pharmacognosy (1)
An introduction to pharmacognosy and a detailed pharmacognostical study of drugs composed of leaves, flowers, barks, galls and woods and unorganized drugs.

PG 303 Pharmacognosy (2)
Detailed pharmacognostical study of drugs composed of seeds, fruits, herbs, rhizomes and roots and animal drugs

PG 404 Phytochemistry (1)
Devoted to the study of plants therapeutically active principles; volatile oils, carbohydrates, resins and resin combinations, bitter principles and tannins

PG 505 Phytochemistry (2)
Detailed study of phytochemicals; alkaloids and glycosides, in addition to hallucinating and anticancer drugs. Introduction to chromatography and separation technique.

PG 606 Quality Control of Herbal Drugs
Quality control of herbal drugs including; herbal adulteration, detection of common pollutants in herbal medicine such as pesticide residues, heavy metal, radioactive contaminants, aflatoxins, bacteria and fungi.

PG 807 Phytotherapy
Guidelines for prescribing herbal medicines, drugs affecting digestive system, cardiovascular system, respiratory system, nonspecific enhancement of resistance, urinary system, rheumatic conditions, nervous system, nonspecific enhancement of resistance, urinary system, rheumatic conditions, nervous system, gynaeocological conditions, cancer, skin diseases, eye diseases, wounds and other injuries.

PG E8 Alternative Medicinal Therapies
The study of herbal preparations, nutritional supplements, and homeopathies. The study of herbal preparations that are widely used by the general public as self-selected OTC (over-the-counter) products/NPDs (nonprescription drugs). Food items for therapeutic, disease prevention, or health promotion purposes. Emphasis will be placed on the role of the pharmacist to help clients make an informed choice and counsel them on the selection of useful and safe products.

PG E9 Productions and Manufacture of Medicinal Plants
Commercial production of medicinal plants, cultivation, collection, drying, preservation, extraction, quality control, and final packaging of entire or powdered forms or extracts.

PG E10 Chromatography and Separation Techniques
Introduction and modes of separation, gel filtration and permeation, ion exchange chromatography, type properties, ion exchange and non-ion exchange manifestation and applications. High-pressure liquid chromatography, gas liquid chromatography and their applications.

PT 201 Physical Pharmacy
Principles of physical pharmacy, rheology and the flow of fluids, surface and interfacial phenomena, solutions and their properties, solubility and dissolution rate, disperse systems

PT 202 Pharmacy Orientation
Topic covered: History of pharmacy practice with particular emphasis on Arab impact, roles of the pharmacist, pharmacy organizations, systems of medicine, ethics of pharmacy, system for weights and measures, routes of drug administration, introduction to pharmaceutical dosage forms, types of prescription, and Incompatibilities, pharmaceutical terminology.

PT 403 Pharmaceutical Dosage Forms (1)
Includes, pharmaceutical calculation, pharmaceutical solutions, colloids and macromolecular system, coarse dispersions, suspensions and emulsions. Formulation, preparation and evaluation of solid forms, micromeritics, powders and granules, tablets, coating, hard capsules, soft capsules and microencapsulation

PT 404 Pharmacy Legislation
A detailed presentation of law that governs and affects the practice of pharmacy, legal principles for non-controlled and controlled prescriptions, over-the-counter drug requirements, opening new pharmacies, opening medical stores, opening factories, opening scientific offices, medicine registration, pharmacies and medicine stores management. Pharmacist duties and responsibilities, pharmacist-patient relationship, patient's rights and ethical principles and moral rules.

PT 505 Pharmaceutical Dosage Forms (2)
Formulation, preparation and evaluation of semisolids and related dosage forms, transdermals, topical Drugs and Suppositories, parentral medications, ophthalmic preparations.

PT 506 Pharmacy Administration
Capital requirements, purchasing and financing a new pharmacy, location analysis, pharmacy layout design, space management for pharmacy practice, inventory purchasing and control, OTC merchandising, advertising, interpersonal communication, inter-professional relations and patient consultation

PT 607 Pharmaceutical Technology
Heat transfer, evaporation, drying, extraction, crystallization, filtration, centrifugation and distillation; Mixing, emulsification, homogenization, size reduction, size separation, size enlargements, materials for plant constructions, packaging materials, good manufacturing practice, flow of fluids, mass transfer, safety measures and validation

PT 608 Community Pharmacy Practice
Concept and techniques of pharmaceutical care, the pharmacy profession, professional communication, patient counseling, problem solving skills, role of the pharmacist in management of symptoms of certain disease of cardiovascular system, GIT, kidney, respiratory tract, eye, skin and certain rheumatic and metabolic disease.

PT 609 Biopharmaceutics and Pharmacokinetics
Factors affecting drug absorption, factors affecting drug elimination, product development, pharmacokinetics models, pharmacokinetics following I.V. administration, pharmacokinetics following oral dosage forms, kinetics of drug absorption, clearance, bioavailability and bioequivalence, absolute and relative bioavailability, assessment of bioavailability and correlation between in vitro dissolution and in vivo absorption.

PT E10 Quality Assurances and GMP
Quality control and assurance organization, analytical control, inspection control, documentation, environmental control, GMP regulations, statistical quality control.

PT E11 Applied Industrial Pharmacy
Good manufacturing practice regulations and quality assurance with emphasis on process validation and sampling techniques.

PT E12 Good Manufacturing practices
Concepts, objectives and applicability, general provisions, organization and personal, Building and facilities, materials, equipment, production and process controls, packing and labeling, control, distribution, laboratory controls, records and reports, returned and salvaged drug products, repacking , inspections and recalls

PT E13 Cosmetic Preparations
Definition and concepts, classification, hair preparation, bath preparation, fragrance preparation, make-up preparation, nail lacquers, shaving preparations, after-shave preparations, skin care, anal hygiene products, antiperspirants and deodorants, quality control tests and evaluation of cosmetic products.

PM 401 General Microbiology and Immunology
Eukaryotic and prokaryotic cells, nomenclature of microorganisms, structure and form of the bacterial cells, spores, mycoplasma or PPLO, actinomycetes. Rickettsiae, viruses, eukaryotic microorganisms (fungi), bacterial genetics, molecular genetics, physiology of microorganisms, the growth curve microbial metabolism.

PM 502 Clinical Microbiology
Topic covered include: Bacteriology; gram positive bacteria, the mycobacterium group, Gram negative bacteria, Chlamydia and Rickettsiae. Mycology: Ringworm, Moniliasis, Maduromycosis and Sporotrichosis. Virology: RNA viruses and DNA viruses
Immunology: Host parasite relationship, Non-specific and specific immunity, Mechanism of protective immunity, Hypersensitivity and in vitro antigen antibody reactions, Autoimmunity and auto-immune disease, Immune deficiency disorders, Transplantation immunology, Cancer immunology, Immunological tolerance

PB 703 Pharmaceutical Biotechnology
Introduction, biology of industrial micro-organisms, biophysical and biochemical processes, introduction to tissue culture and genetic engineering techniques. Techniques for the improvement of the economically important plants and animals and for the development of micro-organisms to act on the environment. Manipulation of living organisms, especially at the molecular genetic level, to produce new products, such as hormones, vaccines or monoclonal antibodies, production of pharmaceuticals by microorganisms. Gene therapy.

PM 704 Pharmaceutical Microbiology
Sterilization, sterilization indicators, sterility testing, microbial contamination of pharmaceutical products, aseptic area, the microbiological quality of pharmaceuticals. Antimicrobial agents: classification, mechanism of action of antimicrobial drugs, drug combination, resistance of microorganisms to antimicrobial agents, assessment of a new antibiotic, microbiological assay of antibiotics, microbiological assay of vitamins, amino acids and growth factor, mode of action of nonantibiotic antimicrobial agents. Chemical disinfectants, antiseptics and preservatives.

PM E5 Biological Standardization
Assays of hormones, sera, vaccines, toxins, antitoxins, antibiotics and vitamins.

PM E6 Antimicrobial Agents
Factors affecting choice of antimicrobial agent, types of antimicrobial compounds, types of antibiotics and synthetic antimicrobial agents, clinical uses of antimicrobial drugs, manufacturing of antibiotics and other synthetic antimicrobial agents, principle methods of assaying antibiotics, mechanism of action antibiotics, bacterial resistance

PO 501 Pharmacology (1)
The general principles of pharmacology, pharmacokinetics, pharmacodynamics, receptor theory and drug interaction. This is followed by a comprehensive study of drugs acting on the autonomic nervous system, cardiovascular system and renal system and autacoids.

PO 702 Pharmacology (2)
Drugs affecting the central nervous system, the gastrointestinal system, the blood and blood forming elements, as well as the drugs acting locally; the course deals with the chemotherapy of microbial diseases, neoplastic diseases and parasitic infestation and the study of hormones and hormone antagonists.

PO 803 Drug Interactions
Mechanism of drug interaction, significance of drug-drug interaction, management of drug-drug interaction, drug interaction of antibiotics, antiarhythmics, anticoagulants, anticonvulsants, barbiturates, beta-agonists and antagonists, calcium channel antagonists, sulfonamides, drug-food interaction, drug-smoking interaction, drug-environment interaction.

PO 904 Toxicology and Forensic Chemistry
Introduction to toxicology, general principles of toxicology, disposition of toxicants, poisoning with common drugs, poisoning with common chemicals, chemical and biological warfare agents, radiation and radioactive material toxicity, general management of poisoning, clinical toxicology of specific drug groups, management of enveromation with natural toxins, maternal, foetal and neonatal toxicity.

Therapeutics
Therapeutic regimens for important prevalent diseases, including non-pharmacological approaches, pharmacotherapeutic requirements for treatment of pediatric and geriatric patients, and for pregnant and lactating mothers, immuno-compromised patients, patients with reduced organ function, and those with multi-morbidities, importance of form and route of administration, dialysis procedures, characteristics of certain therapeutic regimens, particularly with regard to anti-infective therapy, oncological therapy, and supportive therapy, anticoagulant therapy, immuno- and gene therapy and therapy of patients in intensive care

PO 906 Clinical Pharmacology
General principles of pharmacotherapy, principles of pharmacotherapy in special patients, impact of drug interactions on therapeutics, pharmacotherapy for infectious diseases, cardiovascular disorders, respiratory disorders, gastrointestinal tract disorders and neurological and psychiatric disorders.

PO 007 Therapeutics (2)

PO E9 Veterinary Pharmacology
The commonly used veterinary biological and pharmaceutical preparations; general sanitary and management procedures for the prevention and control of livestock diseases; a brief review of infectious diseases and animal parasites

PB 401 Biochemistry (1)
Subcellular organelles and membranes. Biological and biochemical properties of proteins, nucleic acids, carbohydrates, lipids, porphyrins and enzymes. Biological oxidations, and related biochemical processes.

PB 502 Biochemistry (2)
Metabolic map, regulation of metabolism, metabolism of carbohydrates, metabolism of lipids, nitrogen metabolism, integration of metabolism.

PB 803 Clinical Biochemistry
The course covers the analysis of blood and body fluid tests for the functional state of liver, kidney, heart, bone, gastrointestinal tract, endocrine glands, and interpretation of the results in relation to health and disease.

MD 101 Biophysics
Cell membrane structure, method of transport, channel types, receptors. Application of action potential, electrocardiogram and electroencephalogram identification and waves elucidation.

MD 102 Cell Biology
The cell theory, membranous organelles, non-membranous organelles, the cell inclusions, the nucleus, cell growth and proliferation, apoptosis, apoptosis and cancer, apoptosis and AIDS, apoptosis and organ transplants, cellular aging.

MD 203 Histology
Cytology, various tissues (epithelial, connective, muscular and nervous), heart, blood vessels, lymphatic organs, skin and its appendages, systems (digestive and associated glands, respiratory, urinary, reproductive, central nervous system), endocrine glands and eye.

MD 304 Anatomy
Introduction, skeletal system, muscular system, articular system, fascia, cardio-vascular system, lymphatic system, nervous system, digestive system, respiratory system, uro-genital system, endocrine glands, cytology, blood, structure of liver, spleen, lungs, kidney, lymph nodes, cardiac muscle, stomach, intestine and aorta

MD 305 Physiology
Introduction (body water, homeostasis, transport of materials), nervous system (autonomic nervous system), neuron structure and function (reflex arc), cardiovascular system, blood, respiratory cycle, gastrointestinal system, reproduction system, renal system, endocrine glands and body temperature regulation

MD 406 Parasitology
Introduction, protozoology; amoebae; ciliate; flagellates; blood and tissue sporozoa. Medical helminthology; nematodes; cestodes; trematodes, and arthropods

MD 507 Pathophysiology
Introduction to pathophysiology, cell injury, inflammation and immune response, autonomic nervous system in health and disease, endocrine disorders, pancreatic disorders, fluid and electrolyte imbalance, vascular and haematological disorders, disease of urinary, pulmonary and digestive systems.

MD 608 Pathology
The study of the etiology, principle diagnostic features, and main characteristics of diseases of the cardiovascular system, respiratory tract, central nervous system and other important organ systems of the body.

MD 609 First AID
Basic Life Support, bleeding, shock, medical emergencies, poisoning, bones and joints, soft tissue injuries, rescue and transportation

MD 710 Public Health
Introduction, epidemiology, communicable and non-communicable diseases, control of communicable diseases, immunization, infections, occupational medicine, environmental health, water-borne and food borne diseases, milk-born diseases, nutrition and family health, environmental pollution, waste water treatment, waste disposal

PP 701 Radiopharmaceuticals
Basic principles involving the application of radiation and radioactive compounds in medical diagnosis, therapy and industry. Rationale for utility, preparation and quality control of radiopharmaceuticals. Biologic effects of various radiations

PP 702 Clinical Pharmacy (1)
Definition and concepts, case history, patient management approach, patient history taking, clinical problem solving. Topics of discussion include, clinical drug-interactions, adverse drug reactions, drugs interference and clinical laboratory data.

PP 703 Hospital Pharmacy
Organisation and structure of a hospital pharmacy, hospital pharmacy department and dispensing, hospital formulary, radio-pharmaceuticals and nuclear pharmacy, surgical dressing and sutures, plasma substitute, central sterile supply unit and its management, manufacture of sterile and non-sterile products, I.V. admixtures, pharmacy and therapeutic committee and manufacturing units in hospitals.

PP 704 Controlled Drug Delivery
Controlled and Modulated release drug delivery systems, theory, methods. eg. Microcapsules – Bioadhesives.

PP 805 Clinical Pharmacy (2)
Clinical pharmacy in obstetrics, gynaecology, neonates, paediatrics, geriatrics, blood disease and CNS disease. Nutritional deficiencies, energy and nutritional needs, enteral and parenteral nutrition

PP 806 Drug Marketing
Marketing analysis, orientation to decision making, management of new product venture, advertising distribution, marketing information system.

PP 907 Clinical Pharmacokinetics
Introduction, applied clinical pharmacokinetics, therapeutic drug monitoring, mono and multi-exponential pharmacokinetics, Non-compartmental pharmacokinetics and moment analysis. Drug distribution and drug clearance mechanisms, IV infusion kinetics and kinetics following extra-vascular dosing, metabolite kinetics, multiple dose kinetics, non-linear pharmacokinetics, dosage regimen design, dosage individualization of drugs of low therapeutic index, especially in patients with compromised renal and hepatic function.

PP 908 Oncology
Cancer etiology, risk factors, prognosis, types of tumors, systems affected, treatment, adjuvant therapy, patients factors and patient's support measures.

PP 909 Clinical Nutrition
The course focuses on the kinds and amounts of macronutrients (carbohydrates, fat, and proteins) and micronutrients (vitamins and minerals) that are needed to maintain optimal health and prevent chronic disease in adults. Fluid and electrolyte therapy and acid-base balance.

PP 010 Treatment of Dermatological and Reproductive Disease
Most popular skin diseases, types, bacterial, viral and fungal diseases, differentiation.

PP 011 Treatment of Pediatrics Disease
Nutritional requirements in neonates and infants, Nutritional disorders, neonatology, infectious diseases in pediatrics, congenital heart diseases, endocrine disorders, neurological disorders, pediatric emergencies.

PP 012 Treatment of Cardiovascular Disease
Diseases comprising the cardiovascular system, symptoms, prognosis drugs, selection, patients advice with hospital setting practice.

PP 013 Gastroenterology
GIT diseases, epidemiological aspects, symptoms, treatment, patient advice, case reports.

PP 014 Treatment of Respiratory System Disease
Infections, occupational, immunological diseases. Assessment of respiratory efficiency treatment, O2 supply with case study reports.

PP 015 Drug information
Drug information and poison information centres, drug-drug interactions, drug-food interactions, drug disease interactions, and intravenous incompatibilities. Use of the Internet for drug and research information.

MS 101 Mathematics and Statistics
Functions and graphs, limits and continuity, differentiation, exponential, logarithmic, and trigonometric functions, integration, basic differential equations, functions of several variables and problems related to them, probability and random variables, hypothesis testing.

EN 101 English Language
Training in reading, comprehension, basic grammatical rules, writing and translation. The course adopts a systematic approach to proper essay writing, such as idea development, paragraph structure, introductions, support, and conclusions.

EN 302 Medical Terminology
Train the students to understand medical and pharmaceutical terminologies, medical abbreviations, medical idioms, suffixes and prefixes.

HU 201 Human right
* Pass Only

HU 302 Psychology
The objective of this course is to help understand the behavior of the people around us. Topics include: Contemporary psychology: Psychological processes, sensation, perception, conditioned learning, motivation. Secondary psychological processes: learning, memory, language and cognition, intelligence, personality, developmental psychology, environmental and child psychology.
Behavior dynamics: Groups, the individual, environmental, group problems, differentiation, density, handicaps, aggression, the media.
Mental Health: signs of good mental health and disturbances (neuroses and psychoses), conflicts and frustration as precursors to the neuroses, genetic predisposition and diseases as precursors to the psychoses, some of the main therapies in psychology.

HU 903 Sociology
Culture ethnicity, ethnocentrism, prejudice, race and stereotype subculture, skills of communication (verbal and non verbal).

PC 306 Pharmaceutical Analytical Chemistry (2)
Includes titrimetry, acid-base equilibria and titrations, nonaqeous titrations, complexation equilibria and titration, oxidation-reduction and precipitation equilibria and titration, gravimetry.

potentiometry, conductimetry, principles and instruments of spectrometric methods of analysis and applications, water and lipid analysis

PC 407 Instrumental Analysis
This course includes, potentiometry, conductimetry, principles and instruments of spectrometric methods and applications, water and lipid analysis.

PP 702 Clinical Pharmacy (1)
Definition and concepts, case history, patient management approach, clinical problem solving. Topics of discussion include applied clinical pharmacokinetics, therapeutic drug monitoring, clinical drug-interactions, adverse drug reactions, drugs and clinical laboratory data.

(Attachment # 5)

Matrix of the coherence between teaching and learning methods, assessment methods and the Program Key-elements

Attachment # 6
Students' Evaluation and Grading System

1-Grades are a measure of the performance of a student in an individual course.

التقدير	الرمز	عدد النقاط	النسبة المئوية
ممتاز	A^+	4	95 فأكثر
	A	3.85	90 لأقل من 95
	A^-	3.7	85 لأقل من 90
جيد جدا	B^+	3.3	82,5 لأقل من 85
	B	3	77,5 لأقل من 82,5
	B^-	2.7	75 لأقل من 77.5
جيد	C^+	2.3	72,5 لأقل من 75
	C	2	67,5 لأقل من 72,5
	C^-	1.7	65 لأقل من 67,5
مقبول	D^+	1.3	62,5 لأقل من 65
	D	1	60 لأقل من 62,5
راسب	F	0.00	أقل من 60
منسحب	W	-	منسحب
غير مكتمل	I*	-	غير مكتمل
غائب	Abs E**	-	غائب

* The grade point values above apply to marks earned in individual courses; grade point averages are weighted sums of the grade points earned.

2- **Grade Point Average (GPA):** The University calculates for each student, both at the end of each grading period and cumulatively, a grade point average (GPA) based on the ratio of grade points earned divided by the number of credits earned with grades of A-F (including pluses and minuses). Both the periodic and cumulative GPA appears on each student's record. Repeated courses will be counted once toward the calculation of accumulated credit hours. The best-achieved GPA will be used for calculating GPA. The cumulative GPA calculation starts from the

first semester for each student and is updated each semester till his/her graduation. The semester GPA of the student is the weighted average of the grade points acquired in the courses passed in that particular semester.

The Board of Examiners will review and approve all final grades The Board of Examiners is to be advised of any adjustment made and the reason for doing so. This pertains to grades adjusted for the overall class. (Any adjustments made for individual students should be considered on an individual basis at Board of Examiners).

كلية الصيدلة - جامعة المنصورة

مصفوفة توافق بين مقررات برنامج بكالوريوس الصيدلة الاكلينيكة (اللائحة الموحدة والمعدلة و NARS

	course name	course code	MAIN 1- FUNDMENTAL KNOWLED							DOMAIN 2- PROFESSIONAL AND ETHICAL PRACTICE																		DOMAIN 3 - PHARMACEUTICAL CARE										DOMAIN 4- PERSONAL PRACTICE						
			(1-1)							(2-1)			(2-2)				(2-3)		(2-4)				(2-5)			(2-6)		(3-1)				(3-2)						(4-1)			(4-2)		(4-3)	
			1-1-1	1-1-2	1-1-3	1-1-4	1-1-5	1-1-6	1-1-7	2-1-1	2-1-2	2-1-3	2-2-1	2-2-2	2-2-3	2-2-4	2-3-1	2-3-2	2-4-1	2-4-2	2-4-3	2-4-4	2-5-1	2-5-2	2-5-3	2-6-1	2-6-2	3-1-1	3-1-2	3-1-3	3-1-4	3-2-1	3-2-2	3-2-3	3-2-4	3-2-5	3-2-6	4-1-1	4-1-2	4-1-3	4-2-1	4-2-2	4-3-1	4-3-2
1	Physical & Inorganic Chemistry	PC 101	X		X								X		X	X	X	X																				X			X	X	X
2	Pharmaceutical Organic chemistry -I	PC102	X		X								X		X																							X					X
3	Biophysics	MD101	X				X										X																				X	X		X	X	X	X
4	Botany and medicinal plants	PG 101	X		X		X						X	X			X																				X			X			X
5	Cell Biology	MD 102	X	X			X										X	X										X			X						X	X		X	X	X	X
6	Mathematics and statistics	MS 101			X		X	X	X							X										X	X											X					
7	Pharmaceutical Organic chemistry-II	PC 203	X		X								X		X									X													X		X				X
8	Pharmaceutical Analytical chemistry-I	PC 205	X		X								X		X	X	X	X																				X			X	X	X
9	Pharmacognosy -I	PG 202	X	X	X	X							X	X			X																				X			X			X
10	Histology	MD 203	X						X								X							X																X			
11	Physical pharmacy	PT 201	X										x																									x					x
12	Pharmacy orientation	PT 202	X	X									X																		X				X					X			X
13	Human rights and Fighting corruption	HU 201	X							X	X																														X	X
14	Pharmaceutical Organic chemistry-III	PC 304			X								X		X									X							X					X		X				X
15	Pharmaceutical Analytical chemistry-II	PC 306	X		X								X		X	X	X																					X					X
16	Pharmacognosy -II	PG 303	X	X	X	X							X	X			X																				X			X			X
17	Anatomy	MD 304	X						X								X							X																X			
18	Physiology	MD 305	X									X																X												X	X		
19	Medical Terminology	MD311		X																			X																X			X
20	Biochemistry -I	PB 401	X	X	X		X	X					X				X	X										X			X						X	X		X	X	X	X
21	Phytochemistry -I	PG 404	X		X	X							X	X			X																					X			X			X

22	Instrumental Analysis	PC 407	X		X								X		X	X	X	X																			X			X		
23	General Microbiology and Immunology	PM 401	X	X			X																	X	X											X					X		X
24	Parasitology	MD 406	X	X			X	X	X																											X			X			X		X
25	Pharmaceutical dosage forms-I	PT 403	X		X											X																					X						X
26	Pharmacy legislation	PT 404	X	X						X								X																			X						X
27	Pharmacology-I	PO 501				X																				X				X						X			X				
28	Pharmaceutical microbiology	PM 502	X	X	X	X								X		X		X																		X						X		X
29	Pharmaceutical dosage forms-II	PT 505	X		X											X																					X						X
30	Biochemistry-II	PB 502	X	X	X		X	X					X				X									X			X							X	X		X	X	X	X
31	Phytochemistry-II	PG 505	X		X	X							X	X			X																				X			X			X
32	Pathophysiology	MD 507	X				X																			X			X									X	X		X
33	Pharmacy Administration	PT 506	X					X												X				X												X		X	X			X
34	Pharmacology-II	PO 602				X														X						X				X										X		
35	Pharmaceutical technology	PT 607	X					X	X					X	X																							X				X
36	Community pharmacy practice	PP 601	X			X	X																														X		X	X			X
37	Pharmaceutical analysis and quality control	PC 608	X	X	X	X					X			X	X	X	X	X					x				X								X				X	X		X
38	Quality Control of Herbal Drugs	PG 606	X										X										x																				X
39	Pathology	MD 608		X		X					X																		X									X				X
40	First Aid	MD 609	X							X									X												X									X		
41	Pharmacology-III	(PO 703)				x														X									x				x			x						x
42	Medicinal Chemistry I	(PC 709)	X	X		X		X									X			X										X			X	X		X		X				X
43	Hospital Pharmacy	(PP 703)	x			x				x							X																			x		X				x
44	Pharmaceutical Biotechnology	(PM 703)	X	X	X				X				X	X	X																	X				X		X	X		X
45	Clinical Pharmacy 1	(PP 702)				x	x			x										X						x						x					x				x
46	Clinical Microbiology	(PM 704)	X	X			X	X	X											X							X	X							X			X				

47	Controlled Drug Delivery Systems	(PT 710)	X																					X								X		X					X					
48	Radio-Pharmaceuticals	(PT 708)	X														X															X		X					X					
49	Medicinal chemistry-2	(PC 810)	X			X		X													X									X			X	X		X		X			X				
50	Clinical biochemistry	PB 803	x	x		x	x	x			x										x			x				x						x			x	x	x	x				
51	Public health and preventive medicine	(PM 810)	X					X		X		X														X		X					X	X	X		X								
52	Biopharmaceutics and pharmacokinetics	(PT 809)							x									x					x						x								x		x						x	
53	Drug marketing	(PP 806)	X					X	X	X											X					X	X								X	X								X	
54	Management of oncological diseases	(PP 805)	x			x		x		x																x								x										x		
55	Clinical pharmacy -2	(PP 804)				x	x			x											X					x						x							x					x	
56	Clinical Pharmacokinetics	(PP 907)				x																				x						x												x	
57	Elective Course (Advanced Pharmaceutical Analysis-	(PC E12)	x		x							x		x	x	x	x							x										x	x			x	x	x				
58	Therapeutics 1	(PO 905)				X	X														X									X					X					X				
60	Clinical Nutrition	(PP904)	X	X		X	X	X			X										X			X		X					X					X		X	X	X	X				
61	Therapeutics -2	(PO 007)				X	X														X									X					X					X				
62	Management of dermatological and	(PP 008)	x			x			x	x											X									x			x		x								x		
63	Management of Pediatrics diseases	(PP 009)	x			x		x		x														x								x	x		x								x		
64	Management of Cardiovascular diseases (PP	(PP 010)	x			x			x	x											X									x			x		x								x		
65	Management of gastrointestinal diseases	(PP 011)	x			x		x		x																x							x	x		x								x		
59	Treatment of respiratory diseases	(PP 012)	x			x		x				x														x						x		x		x								x		
66	Toxicology and forensic chemistry	(PO 904)				X																X								X				X						X	X			
67	Drug information	(PP 013)						x	x															x								x								x				x	
68	Antimicrobial Agents	(PM E6)	X		X	X	X			X			X								X						X	X						X	X	X			X					X	
69	Cosmetic Preparations	(PT E14)	X		X								X			X																				X								X	
70	Hospitals training		x	x		x	x	x	x	x	x	x		x		x	x				X	X			x				x	x	x		x	x	x	X	X		X				X	

Coherance between Teaching & learning methods, assesment methods and Clinical Pharmacy program learning outcomes (Modified and unified by law)

	MAIN 1- FUNDMENTAL KNOWLEI							DOMAIN 2- PROFESSIONAL AND ETHICAL PRACTICE																		DOMAIN 3 - PHARMACEUTICAL CARE										DOMAIN 4- PERSONAL PRACTICE						
	(1-1)							(2-1)				(2-2)				(2-3)		(2-4)				(2-5)			(2-6)		(3-1)				(3-2)						(4-1)			(4-2)		(4-3)	
	1-1-1	1-1-2	1-1-3	1-1-4	1-1-5	1-1-6	1-1-7	2-1-1	2-1-2	2-1-3	2-1-4	2-2-1	2-2-2	2-2-3	2-2-4	2-3-1	2-3-2	2-4-1	2-4-2	2-4-3	2-4-4	2-5-1	2-5-2	2-5-3	2-6-1	2-6-2	3-1-1	3-1-2	3-1-3	3-1-4	3-2-1	3-2-2	3-2-3	3-2-4	3-2-5	3-2-6	4-1-1	4-1-2	4-1-3	4-2-1	4-2-2	4-3-1	4-3-2
Teaching and learning methods																																									
Developed lecture	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x							
Practical work and tutorials			x	x	x							x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x				x	x	x	
Hybrid learning	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x							
Collaborative learning		x																																	x	x		x			
Self-learning	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x					x
Simulation based learning			x																																				x		
Problem – based learning															x												x									x	x				
Case study					x	x														x						x	x		x				x	x	x	x					
Presentation																									x	x										x	x	x	x	x	x	x
Computer aided learning			x	x										x									x	x																		
Reciprocal learning																											x									x	x		x		x	
Demos										x									x						x	x								x	x			x			x	
Assesment methods																																									
Semester work	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Practical/ tutorial exam			x	x	x							x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Written exam	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x							
Oral exam	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x