Faculty of Pharmacy

Accredit from the National Authority for Quality Assurance and Accreditation of Education (NAQAAE). Resolution number 155, June 27, 2016

Internal Bylaws

For

Bachelor of Pharmacy

(Clinical Pharmacy) Program

Credit Hours System

2009

Contents

Historical Background

The Faculty of Pharmacy, Alexandria University, is considered one of the leading faculties in pharmacy education in Egypt. It started as the School of Pharmacy in 1947, as part of the Faculty of Medicine at Farouk I University. In November 1956, Law No. 245 was issued to transform the School of Pharmacy into an independent faculty in Alexandria University. The duration of the study was three years preceded by a preparatory year. Later, it became four years after the preparatory year where the first class graduated with a five-year study system was in 1964. The academic degree awarded by the faculty was the Bachelor of Pharmacy and Pharmaceutical Chemistry, and it was changed to the bachelor's degree in Pharmaceutical Sciences in the year 1970, and then to the Bachelor of Pharmacy degree in 2014.

The faculty had four academic departments when it was established: Pharmaceutics (including microbiology), chemistry (including analytical chemistry), pharmacognosy and pharmacology. Then, the departments became seven, which are (1) pharmaceutics, (2) pharmaceutical chemistry, (3) pharmaceutical analytical chemistry, (4) pharmacognosy, and (5) pharmacology and toxicology, (6) industrial pharmacy and (7) microbiology and immunology. Recently, the Department of pharmaceutical biochemistry was added to the academic structure of the faculty, and finally a ninth department, the department of pharmacy practice, was added in 2019.

In view of the great increase in the number of students admitted to the faculty over the years, the university created a new building to accommodate the increasing numbers of students. The construction work began in that building in 1995, and the cost of construction reached 25 million Egyptian pounds from the state budget, and it was furnished with contributions from pharmaceutical companies and graduates of the faculty until it opened in October 2003.

Because of the faculty devotion to enhancement of its educational programs to keep up with pace of development in the pharmacy profession, the faculty introduced the "Clinical Pharmacy" program in September 2009, where the first intake of this program graduated in June 2014. During recent years the faculty started taking steps towards institutional accreditation and accreditation of educational programs in accordance with the standards of "The National Authority for Quality Assurance and Accreditation of Education – NAQAAE". The faculty was awarded the accreditation by Resolution No. 155 dated 27/6/2016 from NAQAAE and this accreditation will be renewed in 2021.

Development of the Faculty Regulations:

The "Bachelor of Pharmacy" program for study in the faculty was in accordance with the regulations issued by Ministerial Resolution No. 10 of 8/1/1970, and amendments were made to some provisions of the internal regulations in the years 1974, 1994, 1995, 1998 and 2007. In 2009, another bachelor's degree program in Pharmacy (clinical pharmacy) was introduced as a new credit hours system program. Both programs were 5-year programs.

In 2019, the current 6-year PharmD program was introduced. It is a credit hours system in accordance with the directives of the University of Alexandria and the Pharmaceutical Studies Sector Committee and has been prepared in accordance with the reference national academic standards (NARS) mentioned in the second edition dated April 2017 and based on competencies.

Faculty Vision, Mission and Goals

Vision:

Achieving excellence in pharmacy education and practice both regionally and globally.

Mission:

The Faculty of Pharmacy at Alexandria University is committed to provide the regional community with distinguished pharmacists; scientifically, professionally and ethically, capable of promoting the healthcare system and pharmaceutical industries via excellent education, endorsing innovation, scientific research and entrepreneurship as well as social engagement.

Values:

- Creativity and innovation
- Quality and excellence
- Teamwork and team spirit
- Commitment
- Freedom of thinking
- Justice and equality
- Integrity and transparency

Aims:

- Developing and updating all programs and curricula taught at the faculty to keep pace with the developments in the field of pharmaceutical sciences.
- Supporting scientific research in the field of pharmaceutical sciences.
- Enhancing community engagement and environmental development.
- Developing performance and raising the efficiency of the financial and administrative systems.

Departments:

01 Pharmaceutics
02 Pharmacology and Toxicology
03 Industrial Pharmacy
04 Microbiology and Immunology
05 Pharmaceutical Chemistry
06 Pharmacognosy
07 Pharmaceutical Analytical Chemistry
08 Pharmaceutical Biochemistry
09 Pharmacy Practice

Internal Bylaws

Article (1): Program vision, mission and aims

The Bachelor of Clinical Pharmacy is a flexible program that aims for preparing a qualified pharmacists with the latest pharmacy and medical concepts and all modern technicalities that makes him/her capable of working efficiently at hospitals and providing pharmaceutical services at a professional level in public and private pharmacies, pharmaceutical factories, drug control laboratories and food analysis, in addition to working in the field of drug information and marketing, and actively participating in scientific research through research centers and universities to serve the community.

The program focuses on the pharmacist's role in providing the appropriate health care to the patient inside and outside hospitals by following up the patient's medication regimen and studying the principles of clinical pharmacokinetics and their applications in treatment in various pathological conditions and finding appropriate treatment regimes in cooperation with the attending physician which results in improving patient health care and reducing drug interactions.

Article (2): Academic degree awarded to the graduates

Upon the request of the Faculty Council, the University Council awards the 5-year Bachelor of Pharmacy (Clinical Pharmacy Program) degree according to the credit hour system.

Article (3): Education system

The duration of the study in the program is five academic years (five levels over ten semesters) according to the credit hours system in addition to 300 summer training hours in private and government pharmacies and hospital pharmacies that take place during the summer holidays after the end of the third or fourth level and before starting the mandatory advanced training year.

Each academic level is divided into two semesters (fall and spring) and the duration of each semester is fifteen weeks. Some courses may be offered in a summer semester of six to eight weeks of intensive study. The study in the summer semester is optional. Courses can be taught fully or partially electronically, and students can be assessed, and exams can be taken electronically.

The credit hour is the unit of study and is equivalent to one contact hour of theoretical weekly study or two contact hours of practical lessons in one semester (15 weeks), or four contact hours of field training per week in a semester (a total of 48 contact hour of field training is equivalent to one credit hour per semester).

After taking the opinion of the councils of the scientific departments, the Faculty Council may decide to teach one or more courses in the blended education (hybrid) mode so that the courses are studied at a rate of 60% face to face and 40% for distance education or any other percentage approved by the Faculty Council after taking the opinion of the relevant department council according to the nature of the course. The decision of the Faculty Council is submitted to the University's Education and Student Affairs Committee for approval in preparation for raising it to the University Council for approval.

Article (4): Program design

The total number of credit hours in the study plan is 200 credit hours, in addition to the university requirements. The university requirement courses are graded as pass/fail and are not included in the GPA.

Learning system is through theoretical lectures, group discussions, practical sessions, workshops, field training, research, and presentation of proposals, in addition to cooperation with the community surrounding the university and learning through the work environment.

Article (5): Registration

The faculty assigns for each group of students an academic advisor from the faculty members who performs the tasks of care and guidance and is responsible for the student in scientific, social and psychological affairs and guides him in everything related to his university life and assists students in choosing courses from the list of courses offered by the faculty in each semester. The opinion of the academic advisor is advisory and non-binding. Each student must personally register the courses he wishes to study in each semester. However, the courses and the number of credit hours should be chosen via consultation and agreement with the academic advisor.

The registration of courses is only approved with the approval of the academic advisor in the case of students who have a GPA of less than one. For a course to be registered, the student must pass successfully its pre-requisite.

The student should fill out the registration form of the courses at the specified times according to the announced university calendar for each academic semester, and it is not permissible to attend the study until after the registration process has ended.

The student is not allowed to register late for the specified times except with a compulsory excuse accepted by the faculty, provided that the delay period does not exceed a week from the end of the registration period.

A- The academic load

A- Academic load

Academic load is the number of credit hours a student registers in one semester and it must be taken into account that the student's registered academic load in any semester should not be less than 12 credit hours and not more than 22 credit hours and that the student's load for students with under achievement should not exceed 12 credit hours. The academic load during the summer semester, is of a maximum of 10 credit hours.

B- Add, drop and withdrawal:

After completing the registration procedures, the student may add or drop a course or more in any semester, provided that this is during the specified periods according to the announced university calendar for each semester taking into consideration the minimum and maximum academic loads.

After registration, the student may also withdraw from one or more courses in any semester without being considered failing in this course, if he submits the request to withdraw during the specified periods according to the university calendar announced for each semester.

Article (6): Attendance

The student must attend the theoretical lectures, group discussions, practical sessions, field training and assignments, and the Faculty Council, upon the request of the councils of the relevant scientific departments, may deprive the student of applying for the final written examination if his/her absence exceeds 25% of the total contact hours for each course. A grade of (FW) is made for him/her and he/her must re-sit the course.

The student must sit for the final written exams according to the dates determined for them according to the university calendar announced for each semester. The student is not considered to be a failure in case of absence for a compulsive excuse accepted by the Faculty Council. The student or his guardian fulfills an incomplete course request, and an incomplete interim assessment is calculated in this course Incomplete (I).

Article (7): Study language

Study in this program is in English. However, some courses may be taught in Arabic based on the recommendation of the relevant scientific department and the approval of the Faculty and University Councils.

Article (8): Summer training

The student must complete a period of 200 training hours under the supervision of staff members in community pharmacy approved by the faculty council in addition to 100 training hours in hospital as clinical pharmacist during summer vacations after the end of the third or fourth level respectively.

Article (9): Admission requirements

It is required for those applying to join the program to fulfill all the conditions specified by the Supreme Council of Universities.

Transfer of students enrolled in a similar program in one of the pharmacy colleges in Egyptian or foreign universities may be accepted, provided that the student meets the requirements for admission of the Faculty of Pharmacy at Alexandria University, and the courses that the student studied in the other faculty are transferred according to the rules determined by the Faculty Council, provided that the maximum number of academic hours allowed to be transferred for the student do not exceed 40% Of the total number of credit hours for the program the student is enrolled in.

Article (10): The final grade of a course consists of the sum of the marks earned by the students during his semester work and the final written and oral exam. The following tables show the grading system for the courses of this program. For the student to pass a course he/she should achieve at least 30% of the marks of the final written exam and 60% of the total course marks

The grading system of the courses

Description of Grade	Grade	Points	Percentage
Excellent	**A**	**4.00**	**90 and more**
	A-	**3.7**	**From 85 to less than 90**

Very Good	**B^+**	**3.3**	**From 82.5 to less than 85**
	B	**3**	**From 77.5 to less than 82.5**
	B^-	**2.7**	**From 75 to less than 77.5**
Good	**C^+**	**2.3**	**From 72.5 to less than 75**
	C	**2**	**From 67.5 to less than 72.5**
	C^-	**1.7**	**From 65 to less than 67.5**
Satisfactory	**D^+**	**1.3**	**From 62.5 to less than 65**
	D	**1**	**From 60 to less than 62.5**
Fail	**F**	**0**	**Less than 60**
Withdrawn	**W**	**-**	
Forced Withdrawal	**FW**		
Incomplete	**I**		

There are other evaluation symbols that are not matched by points - used in some graduation requirements - and they are:

S: Satisfactory level for a course not included in the GPA

U: Unsatisfactory level

T: Degrees obtained by a transferred student from another Faculty of Pharmacy (Transferred)

The student's grade point average (GPA) and cumulative GPA (cGPA) are calculated as follows:

A- The value of the assessment for each course (the points shown in the previous table) is multiplied by the number of credit hours for this course to get the number of points for each course in the semester.

B - Points are summed for all academic courses in which the student is registered in one semester.

C - The total points of all the courses are divided by the total credit hours recorded for the student in one semester, in order to obtain the grade point average, GPA of that semester, as follows:

$$\text{Grade Point Average (GPA) in a semester} = \frac{\text{Total Number of Points in the semester}}{\text{Total Number of Registered Credit Hours in that semester}}$$

The GPA ranges between 0 to 4.

Cumulative Grade Point Average, cGPA is calculated as follows:

$$\text{Cumulative Grade Point Average, cGPA} = \frac{\text{Total Number of Points in all semesters}}{\text{Total Number of Registered Credit Hours in all semester}}$$

Article (11): Failing in courses

The student fails a course in the following cases:

- The student is absent in the final written exam without an excuse accepted by the Faculty Council.
- The student achieves less than 30% of the final written exam score.
- The student achieves less than 60% of the total score of the course.

If a student fails in any mandatory course in any semester, he/she must study the same course and take the exam in it when the course re-opens again and the highest grade, he/she shall receive will be (D +). On the other hand, if the student fails in an elective course, he/she can re-study it or study another elective course to complete the graduation requirements, after the approval of his/her academic advisor and he/she shall receive the new grade he accomplishes.

Article (12): Underachievement

The underachievement of the student is considered if he/she obtains a cGPA of less than "one". A student who obtains a GPA of less than 1 for a period of six consecutive semesters or ten inconsecutive semesters shall be dismissed from the faculty after the approval of the Faculty Council. In this respect, the summer semesters, if any, will not be taken into consideration. The student with underachievement is allowed to re-study the courses he/she has passed with a grade of D in order to improve his/her cGPA and the higher score that the student obtains is calculated in his/her cGPA.

Article (13): Registration suspension

A student shall be considered as dropping out of study if he/she has not enrolled in a semester or has withdrawn from the class, whether with or without an excuse. The student may drop out of the study for two consecutive semesters or three non-consecutive semesters as a maximum, after taking the approval of the Faculty Council. If the student dropped out of the study for a period longer than that without an excuse accepted by the Faculty Council and approved by the University Council, the student is dismissed permanently from the Faculty.

Article (14): Graduation requirements

To be awarded the Bachelor of Pharmacy (Clinical Pharmacy) degree according to the credit hours system, the following is required:

1- To study and pass 200 credit hours distributed over ten semesters. These include 183 mandatory credit hours and 6 elective credit hours (see study plan for the distribution of courses) in basic sciences, pharmaceutical sciences and humanitarian sciences and the cGPA of the student is not less than one.

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

Course Code	Course Title	Credit Hours		
		L	P	Total
PC E11	Drug Design	2		2
PC E12	Advanced Pharmaceutical Analysis -Spectroscopy	2	-	2
PG E8	Alternative Medicinal Therapies	2	-	2
PG E9	Production & Manufacture of Medicinal plants	2	-	2
PG E10	Chromatography and Separation Techniques	2	-	2
PT E10	Quality Assurances and GMP	2	-	2
PT E11	Applied Industrial Pharmacy	2	-	2
PT E12	Good Manufacturing practices	2	-	2
PT E13	Cosmetic Preparations	2	-	2
PM E5	Biological Standardization	2	-	2
PM E6	Antimicrobial Agents	2	-	2
PO E9	Veterinary Pharmacology	2	-	2

L: Lecture; P: Practical

2- The student must complete a period of 200 training hours under the supervision of staff members in community pharmacy approved by the faculty council in addition to 100 training hours in hospital as clinical pharmacist during summer vacations after the end of the third or fourth level respectively.

3- Passing the university's requirements for graduation which are 11 credit hours as Pass/Failure courses and are not counted in the GPA. in addition to military education (for Egyptian males).

The University requirements:

Course code	**Course Title**	**Credit Hours**		
		L	**P/T**	**Total**
CS101	Computer Science	1	1	2
EN101	English language	2	--	2
HU201	Human Rights and Fighting Corruption	2	--	2
HU302	Psychology	2	--	2
HU903	Sociology	1	---	1
NP801	Innovation and Entrepreneurship	1	1	2
Total		10	2	11

L: Lecture; P: Practical; T: Tutorial

Article (15): Student discipline system

Students enrolled in the program are subject to the disciplinary system set out in the Egyptian Universities Regulatory Law Number 49 for the year 1972 and its executive regulations.

Article (16): Courses codes

Key for Course Abbreviations

CS 000	Computer Science
EN	English language
HU	Humanities
MS	Mathematics
PB	Biochemistry
PC	Chemistry
PG	Pharmacognosy
PM	Microbiology and Immunology
PO	Pharmacology and Toxicology
PP	Pharmacy Practice
PT	Pharmaceutics and Pharmaceutical Technology
MD	Medical Courses

1. The Letter 'P' means that the courses are offered to students of Pharmacy only.
2. The first digit represents the semester number.
3. The second and third digits represent the course number.

Article (17): Study plan

Article (18): Courses contents

17 The Study Plan

Table (1)

Semester (1)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total Mark	Final Exam (hr)
		Lecture	Practical	Total		Periodical Exam	Practical	Written Exam	Oral		
Physical & Inorganic Chemistry	PC 101	2	1	3	Registration	10	25	65	-	100	2
Pharmaceutical Organic Chemistry -1	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	65	-	100	1
Mathematics and Statistics	MS 101	2	-	2	Registration	10	-	90	-	100	2
Computer Sciences	CS 101	1	1	2	Registration	10	25	65	-	100	1
English language	EN 101	2	-	2	Registration	10	-	90	-	100	2
Total		13	6	19						800	

Table (2)

Semester (2)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total Mark	Final Exam (hr)
		Lecture	Practical	Total		Periodical Exam	Practical	Written Exam	Oral		
Pharmaceutical Organic Chemistry-2	PC 203	2	1	3	Pharmaceutical Organic Chemistry-1	10	25	50	15	100	2
Pharmaceutical Analytical Chemistry-1	PC 205	2	1	3	Registration	10	25	50	15	100	2
Pharmacognosy-1	PG 202	2	1	3	Botany and Medicinal Plants	10	25	50	15	100	2
Histology	MD 203	2	1	3	Registration	10	25	65	-	100	2
Physical Pharmacy	PT 201	2	1	3	Registration	10	25	50	15	100	2
Pharmacy Orientation	PT 202	2	-	2	Registration	10	-	90	-	100	2
Human Rights	HU 201	2	-	2	Registration	10	-	90	-	S/U	2
Total		14	5	19						600	

Table (3)

Semester (3)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total Mark	Final Exam (hr)
		Lecture	Practical	Total		Periodical Exam	Practical	Written Exam	Oral		
Pharmaceutical Organic Chemistry-3	PC 304	2	1	3	Pharmaceutical Organic Chemistry-1	10	25	50	15	100	2
Pharmaceutical Analytical Chemistry-2	PC 306	2	1	3	Pharmaceutical Analytical Chemistry-1	10	25	50	15	100	2
Pharmacognosy-2	PG 303	2	1	3	Botany and Medicinal Plants	10	25	50	15	100	2
Anatomy	MD 304	1	1	2	Registration	10	25	65	-	100	1
Physiology	MD 305	3	1	4	Registration	10	25	65	-	100	3
Medical Terminology	EN 302	2	-	2	Registration	10	-	90	-	100	2
Psychology	HU 302	2	-	2	Registration	10	-	90	-	100	2
Total		14	5	19						700	

Table (4)

Semester (4)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total Mark	Final Exam (hr)
		Lecture	Practical	Total		Periodical Exam	Practical	Written Exam	Oral		
Biochemistry-1	PB 401	2	1	3	Registration	10	25	50	15	100	2
Phytochemistry-1	PG 404	2	1	3	Pharmacognosy-1	10	25	50	15	100	2
Instrumental Analysis	PC 407	1	1	2	Registration	10	25	50	15	100	1
General Microbiology and 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 Dosage Forms-1	PT 403	2	1	3	Physical Pharmacy	10	25	50	15	100	2
Pharmacy Legislation	PT 404	1	-	1	Registration	10	-	90	-	100	1
Total		12	6	18						700	

Table (5)

Semester (5)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total Mark	Final Exam (hr)
		Lecture	Practical	Total		Periodical Exam	Practical	Written Exam	Oral		
Pharmacology-1	PO 701	2	1	3	Physiology	10	25	50	15	100	2
Pharmaceutical Microbiology	PM 704	2	1	3	Registration	10	25	50	15	100	2
Pharmaceutical Dosage Forms-2	PT 505	2	1	3	Physical Pharmacy	10	25	50	15	100	2
Biochemistry-2	PB 502	2	1	3	Biochemistry-1	10	25	50	15	100	2
Phytochemistry-2	PG 505	2	1	3	Pharmacognosy-1	10	25	50	15	100	2
Pathophysiology	MD 507	2	-	2	Physiology	10	-	90	-	100	2
Pharmacy Administration	PT 506	2	-	2	Registration	10	-	90	-	100	2
Total		14	5	19						700	

Table (6)

Semester (6)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total Mark	Final Exam (hr)
		Lecture	Practical	Total		Periodical Exam	Practical	Written Exam	Oral		
Medicinal Chemistry-1	PC 509	2	1	3	Pharmaceutical Organic Chemistry-2	10	25	50	15	100	2
Pharmaceutical Technology	PT 607	2	1	3	Registration	10	25	50	15	100	2
Community Pharmacy Practice	PT 608	2	1	3	Registration	10	25	50	15	100	2
Biopharmaceutics and Pharmacokinetics	PT 609	2	1	3	Pharmaceutical Dosage Forms-2	10	25	50	15	100	2
Quality Control of Herbal Drugs	PG 606	2	1	3	Pharmacognosy–1	10	25	50	15	100	2
Clinical Microbiology	PM 502	2	1	3	General Microbiology and Immunology	10	25	50	15	100	2
Tromas and First Aid	MD 609	2	-	2	Registration	10	-	75	15	100	2
Total		14	6	20						700	

Table (7)

Semester (7)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total Mark	Final Exam (hr)
		Lecture	Practical	Total		Periodical Exam	Practical	Written Exam	Oral		
Pharmacology-2	PO 802	2	1	3	Pharmacology-1	10	25	50	15	100	2
Radiopharmaceuticals	PP 701	1	-	1	Registration	10	-	90	-	100	1
Clinical Pharmacy-1	PP 702	2	1	3	Registration	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 704	2	-	2	Pharmaceutical Dosage Forms-2	10	-	75	15	100	2
Public Health and Preventive Medicine	MD 710	2	-	2	Clinical Microbiology	10	-	75	15	100	2
Pharmaceutical Biotechnology	PM 703	2	1	3	Registration	10	25	50	15	100	2
Pathology	MD 608	2	1	3	Registration	10	25	50	15	100	2
Total		15	5	20						800	

Table (8)

Semester (8)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total Mark	Final Exam (hr)
		Lecture	Practical	Total		Periodical Exam	Practical	Written Exam	Oral		
Medicinal Chemistry-2	PC 610	2	1	3	Pharmaceutical Organic Chemistry-2	10	25	50	15	100	2
Clinical Pharmacy-2	PP 805	2	1	3	Clinical Pharmacy-1	10	25	50	15	100	2
Phytotherapy	PG 807	2	1	3	Pharmacognosy-1	10	25	50	15	100	2
Pharmaceuticals Analysis and Quality Control	PC 808	2	1	3	Pharmaceutical Analytical Chemistry-2	10	25	50	15	100	2
Clinical Biochemistry	PB 803	2	1	3	Biochemistry-2	10	25	50	15	100	2
Drug Marketing	PP 806	1	-	1	Registration	10	-	90	-	100	1
Drug Interactions	PO 803	2	-	2	Pharmacology-1	10	-	75	15	100	2
Elective Course	PE …	2	1	3	Registration	10	25	50	15	100	2
Total		15	6	21						800	

Table (9)

Semester (9)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total Mark	Final Exam (hr)
		Lecture	Practical	Total		Periodical Exam	Practical	Written Exam	Oral		
Toxicology and Forensic Chemistry	PO 904	2	1	3	Pharmacology-2	10	25	50	15	100	2
Therapeutics-1	PO 905	2	1	3	Pharmacology-2	10	25	50	15	100	2
Clinical Pharmacokinetics	PP 907	2	1	3	Biopharmaceutics and Pharmacokinetics	10	25	50	15	100	2
Oncology	PP 908	2	1	3	Pathology and Pharmacology-2	10	25	50	15	100	2
Clinical Nutrition	PP 909	1	1	2	Biochemistry-2	10	25	50	15	100	1
Clinical Pharmacology	PO 906	2	1	3	Pharmacology-2	10	25	50	15	100	2
Sociology	HU 903	1	-	1	Registration	10	-	90	-	100	2
Elective course	PE …	2	1	3	Registration	10	25	50	15	100	2
Total		14	7	21						800	

Table (10)

Semester (10)

Course Title	Course code	Credit hours			Prerequisite	Examination Marks				Total Mark	Final Exam (hr)
		Lecture	Practical	Total		Periodical Exam	Practical	Written Exam	Oral		
Therapeutics -2	PO 007	2	1	3	Pharmacology-2	10	25	50	15	100	2
Treatment of Dermatological and Reproductive Diseases	PP 010	1	1	2	Pathology and Pharmacology-2	10	25	50	15	100	1
Treatment of Pediatrics Diseases	PP 011	2	1	3	Pathology and Pharmacology-2	10	25	50	15	100	2
Treatment of Cardiovascular Diseases	PP 012	2	1	3	Pathology and Pharmacology-2	10	25	50	15	100	2
Gastroenterology	PP 013	2	1	3	Pathology and pharmacology-2	10	25	50	15	100	2
Treatment of Respiratory System Diseases	PP 014	2	1	3	Pathology and Pharmacology-2	10	25	50	15	100	2
Drug Information	PP 015	1	-	1	Pharmacology-2 and Clinical Pharmacy-2	10	-	75	15	100	2
Elective course	PE …	2	1	3	Registration	10	25	50	15	100	2
Total		14	7	21						800	

18 Courses Description

PC101 Physical and Inorganic Chemistry

Matter, its properties and measurements, electromagnetic spectrum, atomic structure, chemical bonding and intermolecular forces. Gases, liquids and solids. Man, and his environment and nuclear chemistry. Solutions, solubility & miscibility. Colligative properties. Thermochemistry. Chemical thermodynamics. Colloidal state.

PC102 Pharmaceutical Organic Chemistry-1

Nature of organic compounds and structures. Nomenclature, aliphatic (saturated and unsaturated) hydrocarbons. Organic reactions (substitution, addition, elimination and condensations). Chemistry of different organic classes: halogenated hydrocarbons, alcohols, ethers, carbonyl compounds, mono- and di-basic carboxylic acids and derivatives, amino acids. Stereochemistry Benzene, aromaticity and arenes

PC203 Pharmaceutical Organic Chemistry-2

Chemistry of aromatic organic compounds including aromatic hydrocarbons, halogens and nitro derivatives, amines and diazonium salts, phenols, aromatic carboxylic acids, aromatic aldehydes, aromatic ketones, sulfonic acids and polynuclear aromatic hydrocarbons. Aliphatic carboxylic acids and acid derivatives. Aliphatic nitro compounds Aliphatic amines.

PC304 Pharmaceutical Organic Chemistry-3

Stereochemistry and stereoisomerism. Organic reactions mechanisms (substitution, addition, elimination and condensations). Heterocyclic compounds including monocyclic mono-heteroatoms and fused bicyclic compounds. Introduction to use of spectroscopic methods in organic chemistry (UV, IR, MS, NMR). Phenols, quinines. Polynuclear aromatic hydrocarbons Amino acids and peptides. Carbohydrates

PC205 Pharmaceutical Analytical Chemistry-1

Mixtures (suspensions, colloids and solutions), colligative properties of solutions (vapor pressure, osmotic pressure, effect on boiling and freezing points). Analytical chemistry: Quantitative analytical chemistry comprises; acid-base titration and buffer solution, precipitimetry and gravimetry.

PC306 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 titration).

PC407 Instrumental Analysis

Spectrophotometric methods of analysis including ultraviolet, visible and flame photometry, spectroflourometry, atomic absorption and flame, electrochemistry (potentiometry, conductimetry, polarography), chromatography.

PC808 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,

pharmacopeia 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.

PC509 Medicinal Chemistry-1
Introduction to pharmaceutical and medicinal chemistry, physicochemical properties of drugs in relation to biological actions, chemotherapeutic agents, synthetic antimicrobial agents, malaria chemotherapy, anti-bacterial antibiotics and cancer chemotherapy.

PC610 Medicinal Chemistry -2
Central nervous system depressants, central nervous system stimulants, cardiovascular agents, analgesic agents, steroids and related compounds.

PCE11 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. Application on software.

PCE12 Advanced Pharmaceutical Analysis Spectroscopy
Application of instrumental methods of analysis (ultraviolet and infrared spectroscopy; NMR; mass spectrometry, atomic absorption spectrometry) to pharmaceutical compounds.

PG101 Botany and Medicinal Plants
Plant kingdom; classification and systemic botany off some lower and higher plants with examples of medically active plants; cytology and plant physiology. A general introduction to pharmacognosy (cultivation, collection, drying, packing storage and adulteration of medical plants), and a detailed pharmacognostical study of drugs composed of leaves.

PG202 Pharmacognosy-1
Detailed pharmacognostical study of drugs composed of flowers, barks, galls, woods and herbs.

PG303 Pharmacognosy -2
Detailed pharmacognostical study of drugs composed of seeds, fruits, rhizomes and roots; animal drugs and unorganized drugs.

PG404 Phytochemistry -1
Devoted to the study of plants therapeutically active principles; volatile oils, carbohydrates, resins and resin combinations, bitter principles and tannins.

PG505 Phytochemistry -2
Devoted to the study of phytochemicals; alkaloids, glycosides, in addition to hallucinating and anticancer drugs. Introduction to chromatography and separation techniques.

PG606 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 metals, radioactive contaminants, aflatoxins, bacteria and fungi.

PG807 Phytotherapy
Guidelines for prescribing herbal medicines, drugs affecting digestive system, cardiovascular system, respiratory system, nonspecific enhancement of resistance, urinary system, rheumatic conditions, nervous system, gynecological conditions, cancer, skin diseases, eye diseases, wounds and other injuries. Naturopathy. Homeopathy. Aromatherapy. Chiropractic. Massage. Pressure-point therapies. Energy-balancing. Combined manual. Mind-body techniques. Yoga. Meditation. Hypnotherapy. Dreamwork. Biofeedback. Pharmacovigilance of herbal medicines.

PGE8 Alternative Medicine 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 pharmacist to help client make an informed choice and counsel them on the selection of useful and safe products. Herb-drug interactions. Evidence-based CAM

PGE9 Production 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 of the extract.

PGE10 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.

PT201 Physical Pharmacy
Principles of physical pharmacy, rheology and flow of fluids, surface and interfacial phenomena, solutions and their properties, solubility and dissolution rates, disperse systems.

PT202 Pharmacy Orientation
Topics covered: History of pharmacy practice with particular emphasis on Arab impact, roles of pharmacists, pharmacy organization, systems of medicine, ethics of pharmacy, systems for weight and measures, routes of drug administration, introduction to pharmaceutical dosage forms, types of prescription and incompatibilities, pharmaceutical terminology.

PT403 Pharmaceutical Dosage Forms-1
Includes pharmaceutical calculations, pharmaceutical solutions, colloids and macromolecular system, coarse dispersion, suspensions and emulsions. Formulation preparation and evaluation of solid forms, micrometrics, powders and granules, tablets, coating, hard capsules, soft capsules and microencapsulation.

PT404 Pharmacy Legislation
A detailed presentation of law that governs and affects the practice of pharmacy, legal principles for non-controlled prescriptions, over the counter drug requirements, opening medical stores, opening factories, opening scientific offices, medicine registration, pharmacy and medicine stores management. Pharmacist duties and responsibilities, pharmacist-patient relationship, patient's rights and ethical principles and moral rules. National drug policy. Essential drug list. Rational use of drugs

PT505 Pharmaceutical Dosage Forms -2
Formulation, preparation and evaluation of semisolids and related dosage forms, transdermal, topical drugs and suppositories. Parenteral medications, ophthalmic preparations.

PT506 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, interprofessional relations and patient consultation.

PT607 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.

PT608 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 diseases of cardiovascular system, GIT, kidney, respiratory tract, eye, skin and certain rheumatic and metabolic diseases. Weight control. Pain management

PT609 Biopharmaceutics and Pharmacokinetics
Factors affecting drug absorption, factors affecting drug elimination, product development, pharmacokinetics models, pharmacokinetics following IV administration, pharmacokinetics following oral dosage forms, kinetics of drug absorption, clearance, bioavailability and bioequivalence, assessment of bioavailability and correlation between invitro dissolution and in vivo absorption.

PT704 Controlled Drug Delivery Systems
Controlled and modulated release drug delivery systems, theory, methods. E.g. microencapsulation and bio adhesives. Targeted drug delivery systems.

PTE10 Quality assurance and GMP
Quality control and assurance organization, analytical control, inspection control, documentation, environmental control, GMP regulation, statistical quality control.

PTE11 Applied Industrial Pharmacy
Good manufacturing practice regulations and quality assurance with emphasis on process validation and sampling techniques. Size reduction. Mixing. Size enlargement & pellitization. Tablet manufacture &trouble shooting. Coating techniques & defects. Manufacture of suppositories. Emulsification and manufacture of semisolid dosage forms creams, ointments, trouble shooting. Packaging &material of construction

PTE12 Good Manufacturing Practice
Concepts, objectives and applicability, general provision, organization and personal, building and facilities, materials, equipment, production and process control, packing and labeling, control, distribution, laboratory control, records and reports, returned and salvaged drug

products, repacking, inspection and recalls. Environmental considerations of pharmaceutical manufacture facilities. Environmental Biotechnology.

PTE13 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, anti-perspirants and deodorants, quality control tests and evaluation of cosmetic products. The legal distinction between cosmeceuticals and drugs.

PM401 General Microbiology and Immunology
Eukaryotic and prokaryotic cells, nomenclature of microorganisms, structures and forms of the bacteria cells, spores, mycoplasma or PPLO, actinomycetes. Rickettsia, viruses, eukaryotic microorganisms (fungi), bacterial genetics, molecular genetics, physiology of microorganisms, the growth curve and microbial metabolism.

PM502 Clinical Microbiology
Topics covered include: Bacteriology, gram positive bacteria, the mycobacterium group, gram negative bacteria, Chlamydia and Rickettsia. 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 invitro antigen antibody reactions, autoimmunity and autoimmune diseases, immune deficiency disorders, transplantation immunology, cancer immunology, immunological tolerance.

PM703 Pharmaceutical Biotechnology
Introduction, biology of industrial micro-organisms, biophysical and biochemical processes, introduction to tissue culture and genetic engineering techniques. Techniques for improvement of economically important plants and animals and for 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.

PM704 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 new antibiotic, microbiological assay of antibiotics, microbiological assay of vitamins, amino acids and growth factors, mode of action of nonantibiotic antimicrobial agents. Chemical disinfectants, antiseptics and preservatives.

PME5 Biological Standardization
Assay of hormones, sera, vaccines, toxins, antitoxins, antibiotics and vitamins

PME6 Antimicrobial Agents
Factors affecting choice of antimicrobial agents, 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 of antibiotics and bacterial resistance.

PO701 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.

PO802 Pharmacology -2
Drugs affecting the central nervous system, the gastrointestinal system, the blood and the 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. Cardiovascular system and renal system.

PO803 Drug Interactions
Mechanism of drug interaction, significance of drug-drug interaction, management of drug-drug interaction, drug interaction of antibiotics, antiarrhythmics, anticoagulants, anticonvulsants, barbiturates, beta-agonists and antagonists, calcium channel antagonists, sulfonamides, drug-food interaction, drug-smoking interaction, drug-environment interaction.

PO904 Toxicology and Forensic Chemistry
Introduction to toxicology, general principles of toxicology, disposition of toxicants, poisoning with common drugs, poisoning with common chemicals, chemicals and biological warfare agents, radiation and radioactive material toxicity, general management of poisoning, clinical toxicology of specific drug groups, management of envenomation with natural toxins, maternal, fetal and neonatal toxicity.

PO905 Therapeutics -1
Therapeutic regimens for important prevalent diseases, including non-pharmacological approaches, pharmacotherapeutic requirements for treatment of pediatric, geriatric patients and for pregnant and lactating mothers, immunocompromised patients, patients with reduced organ functions and those with multi morbidities.

PO906 Clinical Pharmacology
General Principles of Pharmacotherapy, principles of pharmacotherapy in special patients, impact of drug interactions on therapeutics, pharmacotherapy of infectious diseases, cardiovascular disorders, gastrointestinal tract disorders and neurological and psychiatric disorders.

PO007 Therapeutics -2
Importance of forms and routes of administration, dialysis procedures, characteristics of certain therapeutic regimens, particularly with regards to anti-infective therapy, oncological therapy and supportive therapy, anticoagulant therapy, immune and gene therapy and therapy of patients in the intensive care.

POE9 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.

PB401 Biochemistry-1

Subcellular organelles and membranes. Biological and biochemical properties of proteins, nucleic acids, carbohydrates, lipids, porphyrins and enzymes. Biological oxidation and related biochemical processes.

PB502 Biochemistry -2
Metabolic map, regulation of metabolism, metabolism of carbohydrates, metabolism of lipids, nitrogen metabolism, integration of metabolism.

PB803 Clinical Biochemistry
The course covers the analysis of blood and body fluids tests for the functional state of the liver, kidney, heart, bones, gastrointestinal tract, endocrine glands, and interpretation of the results in relation to health and disease.

MD101 Biophysics
Cell membrane structure, methods of transport, channel types, receptors. Application of action potential, electrocardiogram, electroencephalogram identification and wave elucidation.

MD102 Cell Biology
The cell theory, membranous organelles, non-membranous organelles, cell inclusions, nucleus, cell growth and proliferation, apoptosis, apoptosis and cancer, apoptosis and AIDS, apoptosis and organ transplantation, cellular aging.

MD203 Histology
Cytology, various tissues (epithelium, connective, muscular 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.

MD304 Anatomy
Introduction, skeletal system, muscular system, articular system, fascia, cardiovascular system, lymphatic system, nervous system, digestive system, respiratory system, urogenital system, endocrine glands, cytology, blood, structure of liver, spleen, lungs, kidney, lymph nodes, cardiac muscles, stomach, intestine and aorta.

MD305 Physiology
Introduction (body water, homeostasis, transport of materials), nervous system (autonomic nervous system), neuron structure and function (reflex arc), cardiovascular system, respiratory cycle, gastrointestinal system, renal system, endocrine glands and body temperature regulation.

MD406 Parasitology
Introduction, protozoology, amoebae, ciliate, flagellates, blood and tissue sporozoa. Medical helminthology, nematodes, cestodes, trematodes and arthropods.

MD507 Pathophysiology
Introduction to pathophysiology, cell injury, inflammation and immune response, autonomic nervous system in health and disease, endocrine disorders, pancreatic disorders, diseases of urinary, pulmonary, and digestive system.

MD608 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.

MD609 First AID
Basic life support, bleeding, shock, medical emergencies, poisoning, bone and joints, soft tissue injuries, rescue and transportation.

MD710 Public Health
Introduction, epidemiology, communicable and communicable diseases, control of communicable diseases, immunization, infections, occupational medicine, environmental health, water-borne and food-borne diseases, milk-borne diseases, nutrition and family health, environmental pollution, waste water treatment, waste disposal.

PP701 Radiopharmaceutical
Basic principles involved in the application of radiation and radioactive compounds in medical diagnosis, therapy and industry. Rationale of utility, preparation and quality control of radiopharmaceuticals. Biological effects of different radiations.

PP702 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, drug interference and clinical laboratory data.

PP703 Hospital Pharmacy
Organization and structure of hospital pharmacy, hospital pharmacy department and dispensing, hospital formulary, radiopharmaceuticals and nuclear pharmacy, surgical dressing and sutures, plasma substitutes, central sterile supply unit and its management, manufacture of sterile and non-sterile products, IV admixtures, pharmacy and therapeutic committee and manufacturing unit in hospitals.

PP805 Clinical Pharmacy -2
Clinical pharmacy in obstetrics, gynecology, neonates, pediatrics, geriatrics, blood diseases and CNS diseases. Nutritional deficiencies, energy and nutritional needs, enteral and parenteral nutrition.

PP806 Drug Marketing
Marketing analysis, orientation to decision making, management of new product venture, advertising distribution, marketing information system.

PP907 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, metabolites kinetics, multiple dose kinetics, non-linear pharmacokinetics, dosage regiment design, dosage individualization of drugs of low therapeutic index, especially in patients with compromised renal and hepatic functions.

PP908 Oncology

Cancer etiology, risk factors, prognosis, types of tumors, systems affected, treatment, adjuvant therapy, patient factors and patient support measures.

PP909 Clinical nutrition
The course focuses on the kinds and amounts of macronutrients (carbohydrates, fats and proteins) and micronutrients (vitamins and minerals) that are needed to maintain optimal health and prevent chronic diseases in adults. Fluid and electrolyte therapy and acid-base balance.

PP010 Treatment of Dermatological and Reproductive Diseases
Most popular skin diseases, types, bacterial, viral and fungal diseases, differentiation.

PP011 Treatment of Pediatric Diseases
Nutritional requirement of neonates and infants. Nutritional disorders, neonatology, infectious diseases in pediatrics, congenital heart diseases, endocrine disorders. Neurological disorders, pediatric emergencies.

PP012 Treatment of Cardiovascular Diseases
Diseases comprising the cardiovascular system, symptoms, prognosis, drug selection, patient advise with hospital setting practice.

PP013 Gastroenterology
GIT diseases, epidemiological aspects, symptoms, treatment, patient advice, case reports.

PP014 Treatment of Respiratory System Diseases
Infections, occupational, immunological diseases. Assessment of respiratory efficiency treatment, oxygen supply with case study reports.

PP015 Drug Information
Drug information and poison information centers. Drug-drug interactions, drug-food interactions, drug-disease interactions, intravenous incompatibilities. Use of the internet for drug research information.

MS101 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, probabilities and random variables, hypothesis testing.

CS101 Computer Science
Introduction to computer technology. Computer hardware, software and operating systems. Using input/output devices and operating systems, data organization. Practice on major application software packages such as word processing, spreadsheets, databases, and presentation graphics. How to use the internet (searching and finding topics) and access to e mails.

EN101 English Language
Training in reading, comprehension, basic grammar rules, writing and translation. The course adopts a systematic approach to proper essay writing such as idea development, paragraph structure, introductions, support and conclusion.

EN3012 Medical Terminology
Train the students to understand medical and pharmaceutical terminology, medical abbreviations, medical idioms, suffix and prefixes

HU201 Human Rights
This course covers the following topics: human rights in the criminal law, the right of a person to change his nationality or renounce one of his nationalities, international covenants relating to the protection of human rights, the relationship of globalization and development with economic, social and cultural rights, economic, social and cultural rights of human beings, human rights in Islamic law, Women's rights in the labour law and social insurance law, human rights in litigation.

HU302 Psychology
The objective of this course is to help understand the behavior of people around us. Topics include: Contemporary psychology, psychological processes, sensation, perception, conditional learning, motivation. Secondary psychological processes: learning, memory, language, cognition, intelligence, personality, developmental psychology, environmental and child psychology. Behavior dynamics: groups, the individual, environmental and group problems, differentiation, density, handicaps, aggression, the media. Mental health: signs of good mental health and disturbances (neuroses and psychoses), conflict and frustration as precursors to neuroses, genetic predisposition and diseases as precursors to psychoses, some of the main therapies in psychology.

HU903 Sociology
Culture ethnicity, ethnocentrism, prejudice, race and stereotype subculture, skills of communication (verbal and non-verbal)

NP801 Innovation and Entrepreneurship
This course is designed to enhance a student's knowledge in leadership, business, and financial skills in pharmacy practice while learning the traits of an entrepreneur, current topics in entrepreneurship with a specific focus on pharmacy practice and patient care programs. This course will teach the participants a comprehensive set of critical skills needed to develop a profitable business project. This course is designed to provide the students the personal and business tools including risk-taking, strategic planning, marketing, competitiveness, and social responsibility to make the transition from the academic environment to the daily practice of pharmacy now and in the future.