Faculty of Pharmacy
Clinical Pharmacy Programme
Guide book
(2015-2016)

Bachelor's degree in Pharmacy

(Clinical Pharmacy)

Index

Introduction:

Alexandria University:
The city of Alexandria is home for Alexandria University that was established in 1938. It became an independent entity in 1942 and was known then as Farouk University. It is now the second largest university in Egypt with many ties to various national and international universities.

Faculty of Pharmacy:
The Faculty of Pharmacy was founded in 1956 in response to the growing healthcare needs in the Arab region. Ever since, the Faculty has been providing the Arab world and even the western communities with efficient pharmacists in the healthcare and research fields.
The Faculty of Pharmacy offers two undergraduate degrees "Bachelor of Pharmacy" and "Bachelor of Pharmacy (Clinical Pharmacy)", in addition to several postgraduate degrees (Diplomas, Pharm D, Master's and PhD).
The Faculty also plays an active role in the continuous education and professional development of pharmacists.

Faculty mission:
The Faculty of Pharmacy, Alexandria University works towards creating a learning and research environment to keep up with the advances in teaching, learning, training and research to provide the healthcare system with scientists and pharmacists capable of good pharmacy practice and well able to face challenges. The faculty also strives to establish dynamic partnerships to effectively develop the pharmaceutical industry and serve the community.

Faculty vision:
We strive for regional and international excellence in education, pharmaceutical research, community service, environmental development and accreditation.

Faculty goals:

1. Develop and sustain a mass of qualified pharmacists having specialized knowledge, professional skills and ethics that agree with the national standards.

2. Support postgraduate education and research in all Faculty departments by updating the programmes and research plans. In addition, to encourage participation in research projects with multiple partners and cooperation with other research facilities and pharmaceutical industries.

3. Develop and train the teaching staff to better deliver their teaching, research and consulting services.
4. Continuous improvement of the undergraduate and postgraduate programmes to keep up with the rapidly advancing field of pharmaceutical sciences and to achieve accreditation.

5. Encourage community service by providing consultation and professional services to different pharmaceutical institutions and to develop and execute specialized programs to continuously improve professional performance.

Faculty description:

The Faculty houses seven departments:

-Pharmaceutics Department (first floor of old building and third floor of new building).

-Industrial Pharmacy Department (ground floor of old building).

-Analytical Chemistry Department (second floor of old building and sixth floor of new building).

-Pharmaceutical Chemistry Department (second and fifth floors of old building and fourth floor of new building).

-Pharmacognosy Department (third floor of old building and fifth floor of new building).

-Pharmacology Department (fourth floor of old building and seventh floor of new building.

-Microbiology Department (fifth floor of old building and eighth floor of new building).

The laboratories are located on the respective floors, according to the departments they serve. Besides, two simulation labs are located on the third and fifth floors of the old building.

The Faculty also contains 11 lecture halls distributed as follows: ground, fifth and sixth floors of old building, ground, first, third, fifth, sixth and eighth floors of new building. In addition to one conference hall located in the sixth floor of old building.

The Faculty library is located in the sixth floor of the old building, it contains various specialized, scientific books and periodicals in the field of pharmacy. A modern digital library is also available for the easy access of international databases.

The Faculty also houses an information technology center in the ground floor of the new building. The center is UNESCO accredited and it offers the International Computer Driving License (ICDL) programme.

Clinical Pharmacy programme:

Clinical pharmacy is a flexible programme that conforms to the students' needs & inclinations as well as emphasizes their capabilities to form a pharmacist well aware of the profession challenges & who always seeks the new technologies in the different pharmacy branches.

The clinical pharmacist is a special pharmacist qualified to work in community & private pharmacies as well as in drug factories, drug surveillance labs, food analysis, drug marketing in addition to research centers & universities.

The programme focuses on the role of the pharmacist in providing the suitable health care in & out of hospitals. This can be achieved by the follow up of the patient's drug system, studying the principles of the drug dynamics and kinetics and their applications in the treatment of the different diseases as well as cooperating with the responsible physician to find the suitable treatment system.

Mission:

Clinical Pharmacy programme seeks excellence in pharmacy education, scientific research and public health services. The programme also seeks to prepare distinguished clinical pharmacists well qualified to work in health services, the academic field and pharmaceutical industry to meet the requirements of the labor market.

Vision:

Clinical pharmacy programme aspires to provide distinct quality of education and scientific research in the field of pharmacy to raise the efficiency of pharmacy practice, clinical services and pharmaceutical industry locally, regionally and internationally.

Scientific degree:

The Bachelor's degree in pharmaceutical sciences (clinical pharmacy) is awarded by Alexandria University following the approval of the board of Faculty of pharmacy.

Study System

The programme is based on credit hour system. The academic year is divided into two semesters each of 15 weeks, in addition to an occasional summer semester of 6-8 weeks of intensive study. The credit hour is equal to one – hour lecture weekly or two – hour practical session weekly for 15 weeks over one semester.

Programme Design:

The program is designed for learning via lectures, practical, tutorial sessions and research projects.

Registration:

- The optimum number of required credits for a registration of a full time student in any semester ranges between 12-22 credit hours for spring and fall semester and a maximum of 9 credit hours for the summer semester.
- A student can add or drop one or more courses after registration within the stated time in each semester provided that the total credits range between 12-22 credit hours.

- A student can withdraw from one or more courses within the stated period in each semester provided that the total credits are not less than 12 credit hours.
- A student withdrawing after the stated period is considered failing the course.

Attendance:

- Students are not allowed to sit for exam unless they attend at least 75% of total practical credits.
- A student should sit the final exam in the stated time & an absent student is considered failing the course.

Study language:

Teaching and scientific supervision of different courses are conducted in English by the academic staff members.

Summer Training:

Students should complete professional training of 200 hours (100 credit hours) and clinical training of 100 credit hours in hospitals under the supervision of the academic staff members nominated by the Faculty board.

Requirements for admission:

Students accepted in this programme should meet the requirements set by the supreme council of universities and the Faculty board has the authority to admit students having the following degrees:

- Bachelor of Science (Chemistry and biology).
- Bachelor of Medicine.
- Bachelor of Veterinary medicine.
- Bachelor of Nursing.
- Bachelor of agricultural Sciences.

according to the regulations set by the Faculty board and approved by the University President. The courses a student prestudied to receive his first Bachelor's degree are taken into account according to the rules set by the Faculty.

It is possible to accept the transfer of students already registered in another Egyptian or foreign faculty of the condition of fulfilling the Faculty admission requirements and again the prestudied courses are accounted for according to the Faculty rules.

Evaluation System:

The final grade of any course is the sum of the mid term, practical, written & oral exams as shown in the tables of the study program.

The minimum level to pass any course is 60%. In addition, the student should get at least 30% in the final written exam. The final percentages and grades are shown in the following table:

Percentages	Grade points	Grade symbol	Grade description
≥ 90	4	A	Excellent
85-< 90	3.7	A-	
82.5- < 85	3.3	B+	Very good
77.5- < 82.5	3	B	
75- < 77.5	2.7	B-	
72.5- < 75	2.3	C+	Good
67.5- < 72.5	2	C	
65- < 67.5	1.7	C-	
62.5- < 65	1.3	D+	Pass
60- < 62.5	1.00	D	
< 60	0.00	F	Fail
withdraw	-	W	withdraw

There are other symbols with no points to go with:

- S: satisfactory level.
- U: unsatisfactory level.
- T: for results of a student transferred from anther faculty.

The cumulative grade point average CGPA is calculated as follows:
a – The grade (by points) of every course is separately multiplied by the number of assigned credit hours for this course to get the quality points of every course.
b- The sum of the quality points of all courses at which the student is registered is obtained.
c- The sum is divided by the total of the assigned credit hours to get the CGPA.

$$\text{CGPA: } \frac{\text{sum of the quality points}}{\text{total of credit hour}}$$

Failure to pass courses:

A student fails a course when:

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

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

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

Academic failure:

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

Suspension of enrollment

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

Requirements for Bachelor's degree:

1. Completion of 197 credit hours of studying specialized courses as well as basic, humanity & social sciences courses.
2. Completion of at least 200 hours of practical training (100 credit hours) under the supervision of an academic staff member in a community or private pharmacy or a pharmaceutical company approved by the Faculty board, in addition to 100 credit hours of clinical training in a university hospital.

Students' discipline:

Students registered for the programme should conform to the disciplinary system listed in the Egyptian universities organization law number 49 for the year 1972 and all complementary laws.

Study Program:

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

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

1. The University requirements: 9 credit hours.
2. The compulsory Faculty requirements: 179 credit hours (courses schedule).
3. The elective Faculty requirements: 9 credit hours.

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

Departments codes:
Key for Courses Abbreviation

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.

1. University Requirements

Course Code	Course Title	Credit Hours*		
		L	P/T	Total
CS 101	Computer Science	1	1	2
EN 101	English Language	2	-	2
HU 201	Human Right	2	-	2
HU 302	Psychology	2	-	2
HU 903	Sociology	1		1
Total		8	1	9

L: Lecture; P/T: Practical or tutorial.

2. Faculty Requirements: See programme curriculum (page 10)

3. Elective Courses

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	1	3
PC E12	Advanced Pharmaceutical Analysis -Spectroscopy	2	1	3
PG E8	Alternative Medicinal Therapies	2	1	3
PG E9	Production & Manufacture of Medicinal plants	2	1	3
PG E10	Chromatography and Separation Techniques	2	1	3
PT E10	Quality Assurances and GMP	2	1	3
PT E11	Applied Industrial Pharmacy	2	1	3
PT E12	Good Manufacturing practices	2	1	3
PT E13	Cosmetic Preparations	2	1	3
PM E5	Biological Standardization	2	1	3
PM E6	Antimicrobial Agents	2	1	3
PO E9	Veterinary Pharmacology	2	1	3

PROGRAMME CURRICULUM

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	PC610	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	

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)
Mixtures (suspensions, colloids and solutions), colligative properties of solutions (vapour pressure, osmotic pressure, effects on boiling and freezing points), Analytical chemistry 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, inprocess 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 509 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 610 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, plant physiology,. A general introduction to pharmacognosy (cultivation, collection, drying, packing, storage, and adulteration of medicinal plants), and a detailed pharmacognostical study of drugs composed of leaves

PG 202 Pharmacognosy (1)
Detailed pharmacognostical study of drugs composed of flowers, barks, galls, woods, and herbs.

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

PO 701 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 802 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 envenomation with natural toxins, maternal, foetal and neonatal toxicity.
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 905 Therapeutics (1)

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, O_2 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.

CS 101 Computer Science
Introduction to computer technology. Computer hardware, software and operating systems. Using various input/output devices and operating systems, data organization. Practice on major application software packages such as word processing, spreadsheets, database, and presentation graphics. How to use the Internet (searching and finding topics) and accessing e-mail.

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 rights

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).

Appendix: Rules of the clinical pharmacy programme
(Bachelor's degree of Pharmacy)
(clinical Pharmcay)

A- Registration:

- Registration should be accomplished by the student, in person, for each new semester, after consulting with the academic advisor.
- Each student should fill a registration form for the courses he wishes to study, in the time frame allocated in the academic calendar.
- Late registration is allowed as long as it was completed no later than one week after the end of the registration period allocated in the academic calendar. In addition, the student should pay the fine set by the Faculty administration for late registration.

General rules:

1- The student should pass the prerequisites for each course he wishes to register for.
2- The student is allowed to register for a full academic load (12-22 credit hours) if he passed all courses, with a CGPA equal to or higher than one.
3- The student, who gets a CGPA equal to or higher than one, but fails courses that are not prerequisites to the higher academic level, is allowed to register for a full academic load (12-22 credit hours), on condition that he repeats the courses he failed when they are open for registration.
4- The student, who gets a CGPA equal to or higher than one, but fails courses that are prerequisites to the higher academic level, should first register for these courses, then he can register for higher level courses to complete a full academic load (12-22 credit hours).
5- The student, who gets a CGPA less than one and fails courses that are not prerequisites to the higher academic level, is allowed to register for a minimal academic load (12 credit hours), on condition that he repeats the courses he failed when they are open for registration.
6- The student, who gets a CGPA less than one and fails courses that are prerequisites to the higher academic level, should first register for these courses, then he can register for higher level courses to complete a minimal academic load (12 credit hours).
7- A student repeating courses, he previously failed, can only get D^+ as highest grade in these courses.
8- The student is allowed to repeat the courses he passed with D grade, in order to improve his CGPA, and the highest grade will be used to calculate his CGPA.
9- The student is graded (I) if he was absent from the final exam, or could not fulfill all course requirements, for reasons accepted by the Faculty

board, on condition that he has attended and fulfilled at least 75% of the course requirements. In such case, the student should sit for the exam during the first week of the next semester, otherwise he will be considered failing the course and will be graded (F). The excuses granted to the Clinical Pharmacy Programme students follow Rule No. (80) of the executive code modified by Presidential Decree No. 278 for the year 1981.

B- Repetition of courses:

For any given course, the student is allowed no more than three chances to register and sit for the exam, for one of the following situations:

1- To change an (F) grade as in:
   - Failing a course
   - Absenteeism without excuse.
   - A student denied sitting for a final exam because of exceeding the absenteeism limit.

2- To improve the CGPA for students who gets (D) grades.

3- After withdrawal from any given course (W), with this once not counted in the three granted chances.

C- Adding and dropping courses:

After completing registration, the student is allowed to change his academic plan by adding or dropping courses, during the time frame allocated in the academic calendar and after consulting with the academic advisor. The student is refunded for the courses dropped during the allocated time frame.
However, the following should be regarded when adding or dropping courses:

1- The student should fill a special form that he signs, together with the academic advisor, before submitting it to the student affairs office.
2- After dropping courses, the minimal allowed academic load is 12 credit hours.
3- After adding courses, the maximal allowed academic load is 22 credit hours.

D- Withdrawal from courses:

Upon his request, the student is allowed to withdraw from one or more courses, after conferring with the academic advisor and during the time frame allocated in the academic calendar. This withdrawal is not considered failure and does not affect the CGPA, in addition, the student can benefit from the three chance allowance for this course and maintains his right to score a maximal grade when he passes the course.
However, the following should be regarded upon withdrawal from courses:

1- The student should fill a special form that he signs, together with the academic advisor, before submitting it to the student affairs office.

2- The student's transcript shows a list of the courses from which he withdrew, with a corresponding (W) grade, that does not affect the calculation of the CGPA.
3- The student is not allowed to withdraw from any given course if he exceeded the 25% limit of absenteeism from practical sessions.
4- After withdrawal from any given course, the minimal allowed academic load is 12 credit hours.
5- The student is refunded according to the following table:

Withdrawal during week	**% of refund**
Three	70%
Four	60%
Five	50%
Six	40%
Seven	30%
Eight	20%
Nine	10%
Ten	---

E- Ultimatums:

The student should be issued an ultimatum in the following cases:

1- Getting a CGPA less than one.
2- If the student is absent for more than 10% of the practical sessions, he is issued a first ultimatum, then a second one if he was absent for more than 20%, in order to prevent him from reaching the limit of absenteeism, in which case he will be denied the chance to sit for the final exam.
3- If he fails a certain course twice, the student is issued an ultimatum since he is about to exhaust his three chances in that course.

Students' activities

- All faculty students are encouraged to join various cultural, artistic and sport activities held and supervised by the students' union along with the youth welfare department in the Faculty.
- Different assemblies and associations including ASPSA (Alexandria Scientific Pharmaceutical Student Association) are also organizing scientific forums, artistic exhibitions, medical convoys and charity work in coordination with the youth welfare department.
- Field trips to pharmaceutical companies are also organized to improve students' knowledge and links with the pharmaceutical industry.

Faculty website

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