

Bylaw of Bachelor Program Pharm D

According to the credit hours system

Faculty of Pharmacy, Minia University

2019

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Introduction

The Faculty of Pharmacy - Minia University offers a distinguished study program that suits the students' preferences and desires, it also highlights their energy and aims to graduate a pharmacist familiar with all the requirements of the profession and the latest branches of pharmacology and all modern technologies that make him/her a distinguished pharmacist in addition to conducting research and services that serve the local and regional community.

Faculty Vision: The Pharmacy Faculty seeks to become an accredited scientific institution at the regional and international level in the field of pharmaceutical sciences and a leading position in scientific research and community service

Faculty mission: Preparing highly qualified professional cadres capable of competing at the regional level through educational programs and keeping pace with the development of scientific research in the development of society and environment service.

The faculty strategic objectives:

The development of institutional capacity through:

1 - Human resources development.

- 2- Development of financial resources.
- 3- Development of the administrative and academic apparatus.
- 4- Work to be credible and ethical.
- 5- Work on the quality of institutional performance.

Developing the community service sector and developing the environment through: -

- 1 - Activating Private units to serve the community.
- 2-Implementing plans to serve the community and develop the environment.
- 3- Community activation based on integration.
- 4- Follow-up graduates and finds ways to communicate with them.
- 5- Providing public services to the surrounding community.

- Developing the education and learning system for the undergraduate and postgraduate degrees through: -

- 1 - Adopting academic standards for bachelor's degree.
- 2- Amending the educational regulations.
- 3- Activating the system of academic guidance and scientific leadership.
- 4- Student support.
- 5- Updating the system of evaluation and examinations.
- 6- Modernization of education and learning methods.
- 7- Developing the abilities of faculty members to contribute to increasing the effectiveness of the educational process.
- 8- Increasing the financial facilities for educating and learning.

Excellence in scientific research through: -

- 1 - Development of research plans.

- 2- Developing resources to finance scientific research.
- 3- Increasing the available facilities for scientific research.
- 4- Increase cooperation with different scientific trends.
- 5- Developing the research skills of faculty members

Scientific Departments: -

Faculty of Pharmacy - University of Minia consists of the following scientific departments: -

- 1 - Department of Pharmacology.
- 2- Department of Pharmacology and Toxicology.
- 3- Department of Analytical Chemistry.
- 4- Department of Medical Chemistry.
- 5- Department of Biochemistry.
- 6- Department of Pharmacognosy.
- 7- Department of Microbiology and Immunology.
- 8- Department of Clinical Pharmacy.

Other departments may be established in accordance with the provisions of the University Regulation Act.

Article 1:

The program Vision:

Scientific excellence and continuous development to serve the therapeutic health system and pharmaceutical industry and achieve sustainable development in order to reach a global prestigious position in the field of pharmacy.

The program mission:

Preparing pharmacists who are professional and qualified with the latest pharmaceutical concepts and therapeutic care that enable them to contribute in the development of the pharmaceutical industry and raise the efficiency of the pharmacy care system at the local and regional level in hospitals and pharmacies through Providing pharmaceutical services at a professional level in public and private pharmacies, pharmaceutical factories and companies, pharmaceutical control laboratories and food analysis, in addition to working in the field of media and pharmaceutical marketing and actively participating in scientific research through research centers and universities to serve the community.

The program objectives:

- 1 - graduation of a distinguished pharmacist who is qualified to work in public and private pharmacies and pharmaceutical factories and companies and pharmaceutical control laboratories and food analysis and work in the field of media, marketing, research and universities.

2- Focusing on the pharmacist role in providing appropriate health care to the patient inside and outside hospitals by educating and advising individuals and communities to improve therapeutic outcomes and reduce the incidence of diseases taking into account that the profession responsibilities and respecting its laws and ethics, and respecting the rights of patients.

3- Preparing a pharmacist who uses evidence-based data to provide modern pharmaceuticals and pharmaceutical services in addition to being able to communicate effectively, leadership, management and entrepreneurship skills.

4- Graduating a pharmacist who works as a lifelong learner with the aim of sustainable professional development and demonstrates the ability to achieve performance evaluation and self-assessment skills.

5- Increasing the competitiveness of the program graduates at the regional level through study and training programs

6- Participating in the service of the community and the development of the

environment and providing a tangible economic return by rationalizing the use of medicines in hospitals.

7- Achieving quality standards in pharmacy education through interactive education and self-learning.

Article 2:

The degree which awarded to graduates:

At the request of the Faculty of Pharmacy Board, the University Council awards a bachelor's degree in pharmacy (Pharm D) in accordance to the credit hours system.

Article 3:

Qualification for higher academic degrees:

Pharm D is the first university degree in the field of pharmacy which necessary to have a license to practice the profession in all available pharmaceutical fields. It also qualifies the graduate to register in postgraduate studies in the different scientific departments of the faculty.

Article 4:

The study system in the program is five years (five levels in ten semesters) according to the system of credit hours plus internship year in various pharmaceutical fields (5+1). In addition to the 100 hours of actual field training in community and government pharmacies and hospital pharmacies, it takes place during the summer holidays for years of study after the end of the third year and before the start of the final year.

Each level (general) is divided into two semesters (autumn 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 credit hour is a module of study and equals a theoretical weekly study hour or a practical lesson of at least two hours per week and is taught over the course of one semester.

Article (5):

Course Program design

The course is designed to be learning by theoretical lectures, panel discussions, practical sessions, workshops, field training, research and presentation, as well as cooperation with the surrounding community in University.

The course is designed to:

First: The number of credit hours is 170 credit hours, in addition to the university's requirements of 4 credit hours.

Second: The number of optional courses are four courses (8 credit hours) were chosen from the list specified by the faculty in the other two levels and it is preferable that those optional courses achieve merits and skills that help them to professional orientation and specialization and be one of the optional courses in one of the areas Clinical pharmacy .

The faculty Council has to establish internal coordination controls for elective courses as well as controls that determine the number of students who are studying each elective courses within the scientific departments, which responsibility is taken over by Prof.Dr./ the faculty's Undersecretary for Education and Students affairs of the faculty to be in charge of the implementation of those controls.

This is in addition to 100 hours of actual summer training starting at the end of the third level and before the start of the final year and in order to keep the achievement of **National Academic Reference Standards. NARS 2017.**

Article 6:

Registration

The faculty assigns to each group of students an academic guide from the faculty members who perform care and guidance tasks and is responsible for the student in scientific, social and psychological affairs, He directs them in all aspects of his university life and assists students in selecting courses from the list of courses which offered by the faculty in each semester. Each student must register the courses which they want to study in each semester; also they need to select the courses and the number of

hours which adopted in consultation and agreement with the academic guide and the requirement to register the course must have successfully passed.

In some cases, the faculty council allows to the student to register in some courses in parallel with the requirements of the courses that the student hasn't successfully passed. If the student's academic burden is less than 12 credit hours (a statement is written by the student's parents that his success in this course will not be approved until he passes the requirement that he was allowed to register. The student must fill out the registration form of courses at the specified times according to the university calendar which announced for each semester and may not be enrolled in the university until the registration process has been completed.

The student isn't allowed to register late for specified times except with an acceptable excuse that accepted by the faculty Dean and the delay shouldn't exceed one week from the end of the scheduled registration period.

Academic burden:

The academic burden is the number of credit hours that the student registers in the same semester and must bear in mind that the student's recorded academic burden in any semester shouldn't be less than 12 credit hours and not more than 22 credit hours. The student's academic burden should not exceed 12 credit hours for the student who fails a lot (see article 13). The Academic burden during the summer semester is up to a maximum of 10 credit hours.

The faculty Council can allow to the student in the last two semesters to increase the academic burden above the maximum and not exceed the number of credit hours (one-time for student benefits)

The faculty Council can also allow a student who fails (see article 13 - academic hindrance) to increase the academic burden above the maximum during the summer semester and not exceed 2 credit hours.

Add, Delete, and Withdraw:

After completing the registration procedure, the student may add or delete to his or her credit hours a course or more in any semester, provided that this is within the specified periods according to the declared university calendar for each semester, taking into account the minimum and maximum academic burden.

The student may also withdraw from one or more courses in any semester without being considered a failure in this course, if he or she applies for withdrawal during the specified periods according to the declared university calendar for each semester and who withdraws after this specified period is considered a failure.

Article (7):

a) The attendance

the student should attend theoretical lectures, panel discussions, practical lectures, field training and assignments, at the request of the councils of the scientific departments, the Student may be deprived of the final written examination if his absence exceeds 25 of the total credit hours for each course.

b) Attending exams, missing them and violating their system

the student must take the final written examinations on schedule according to the university calendar which announced for each semester. The student who missed the final written exam is considered to be a failure in the courses in which the student is absent from the exam and the student is not considered to be a failure in the case of absence with an acceptable excuse that accepted by the faculty Council.

Article 8:

The study language:

Study in the program in English and some courses may be taught in Arabic on the recommendation of the scientific department and the approval of the faculty and university councils.

Article 9:

First field training and advanced field training (internship year)

A-First field training: - The student must complete a first field training period with a total of 100 training hours in community and government pharmacies and hospital pharmacies approved by the faculty Council under the supervision of a faculty member, Training takes place during the summer holidays for years of study after the end of the third level and before the start of the year of internship.

B- Advanced field training (year of internship): - The student must complete the year of internship (academic year in the sense of 9 months) after completing the academic years by training in companies and factories of human and veterinary medicines - companies and factories of supplies, medical devices, cosmetics and supplements Food, herbs, medicinal plants, disinfectants and pesticides - distribution companies and pharmacologic stores - local and international drug control and monitoring centers and bodies (MOH-CAPA-NODCAR-...; WHO,FDA,EMA.. etc) - Centers of Pharmacy and Medical Research, Bioavailability and Clinical Studies (CROs) - Media and Pharmaceutical Marketing..... etc.

(A detailed bylaw is prepared for the internship Year program)

Article (10):

Admission requirements: -

Those who apply for the program are required to be qualified all the conditions which set by the Supreme Council of Universities, the transfer of students who enrolled in a similar program at a pharmacy faculty in Egyptian or foreign universities may be accepted ,provided that the student qualifies the requirements for admission to the faculty and the student is counted the courses he /she studied in the faculty which he/she transferred from it, in accordance with the rules set by the faculty Council.

Article (11):

The assessment system: -

The final degree of the course consists of the total grades of quarterly, practical, written and oral work as described in the study plan tables.

The minimum success in any course is 60 of the total grades of this course, and the student is not successful in any course unless he has obtained 30 of the final written examination degree, and the percentage of the final grades and grades as shown in the following table.

Evaluation system

Grade Range	Points	Symbol	Grade
95 and above	4	A+	Excellent
	3.85	A	
90 less than 95		3.7	
85 less than 90	B+		
82.5 less than 85	3.3	B	
77.5 less than 82.5	3	B-	
77.5 less than 82.5	2.7	C+	Good
72.5 less than 75	2.3		
67.5 less than 72.5	2		
65 less than 67.5	1.7	C-	
62.5 less than 65	1.3	D+	Pass
60 less than 62.5	1	D	
Less than 60	0.00	F	Fail
Withdrawn	-	W	Withdrawn

In-Complete	-	I*	In-Complete
Absent	-	Abs E**	Absent

IC: The student gets this symbol if the attendance rate is met and the student is unable to enter the final oral or written examination (if any) for one or more courses in the same semester for compelling reasons which accepted by the faculty council, and the student must perform the final or oral examination (if any) no later than the second week of the next semester, with keeping the grade.

Abs E: The student gets this symbol if he is unable to enter the final and oral examination (if any) at the date which mentioned above in the previous paragraph (IC) for the absence of the acceptable cause ,the student must register for this course again and study in full while retaining the degree.

There are other evaluation symbols that are not matched by points — used in some graduation requirements — namely:

S: satisfactory Level

U: Unsatisfactory Level

T: Grades which got by a transferred student from another pharmacy faculty.

The student's quarterly rate (GPA) and the cumulative rate (cGPA) are calculated as follows:

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

B- The points of all courses in which the student is enrolled are collected in the same semester.

c-The total points of all courses are divided by the total credit hours recorded for the student in the same semester in order to obtain the quarterly rate as follows:

Quarterly rate (GPA)

$$= \frac{\text{Total points for all courses per semester}}{\text{Total credit hours recorded per semester}}$$

The cumulative rate is calculated as follows:

Cumulative rate (cGPA)

$$= \frac{\text{Total points for all courses for all semesters}}{\text{Total credit hours recorded for all semesters}}$$

Article (12): Fail in courses: -

In case of student absence without an excuse which accepted by the faculty council to take the final written exam.

- If the student has got less than 30 of the final written examination degree.

- Failure to achieve at least 60 of the total grades of the course.

- If the student failed in any course in any semester, he/she has to study the same course and exam in it again, but if he failed in an optional course, he/she can re-study or study another electives courses alternative to complete the graduation requirements, after the approval of the academic guide and the approval of the faculty Council.

Article (13): Academic hindrance:

- A student is considered academically hindered if he or she has a GPA that is less than (1).

A student with a GPA is less than (1) for six consecutive semesters or in 10 non- consecutive semesters dismissed from faculty after the approval of the faculty council.

Summer classes are not taken into account (if any) and the hindered student is allowed to re-study the courses which he passed with a D grade in order to improve the GPA and calculate the higher grade

which got by the student.

Article (14): Drop out of study:

- The student is considered to be suspended from faculty if he/she doesn't register in a semester or withdraws from the semester either by excuse or without excuse and the student may drop two consecutive semesters or three semesters in a row maximum provided that the approval of the faculty Council .It is approved by the University Council and applies to it the provisions of the Executive bylaws of the University Organization.

Article (15): Requirements for a Bachelor of Pharmacy Degree (Pharm D):-

A Pharm D degree in accordance with the credit hours system or its equivalent requires the following :

First: Studying and passing the 170 credit hours which spread over ten semesters and include the requirements of the faculty of 162 credit hours (schedule of courses distribution) and the requirements of the optional faculty requirements and represent the number of credit hours, with a cumulative rate not less than one.

Second: Passing a first field training with a total of 100 hours of training in community and government pharmacies and hospital pharmacies approved by the faculty Council under the supervision of a faculty member. Training is carried out during the summer holidays of the study years after the end of the third level and to complete the year of internship (internship year (excellence) - 9 months) after the completion of the years of study, according to the detailed list of the program of training the year of internship (excellence), which includes the graduation project in one of the majors.

Third: passing the requirements that the university requires to graduate (4 credit hours) under the supervision of Prof /Dr. The faculty's Undersecretary for Education and Students affairs at the

faculty, but not included in the calculation of the student's quarterly or cumulative rate.

Article (16): Student discipline system:

- Students enrolled in the program are subject to the disciplinary system as established in the Egyptian University Organization Act and its executive regulations.

Article (17): Department code and course requirements (Annex 1)

Article 18: study Plan (Annex 2)

Article (19): Courses content (Annex 3)

Article (20): Updating the courses:

It may be updated not more than 20 % of the courses content, based on the proposal of the council of the scientific department and the approval of the faculty council and the approval of the University Council after the necessary justifications.

Article (21): Training program for the year of internship (excellence):

A detailed training program for the final year (the year of internship (excellence) is developed in the form of rotational courses in an annex to the list of the rotational training program in a detailed systematic manner

Annex 1 for article (17)

department code and university and college requirements
and electives courses

Key for Course Abbreviations -1

Code	Departments
MS	Mathematics
PB	Biochemistry
PC	Medicinal Chemistry
PA	Analytical Chemistry
PG	Pharmacognosy
PM	Microbiology and Immunology
PO	Pharmacology and Toxicology
PP	Pharmacy Practice/Clinical Pharmacy
PT	Pharmaceutics
MD	Medical Courses
NP	Non Pharmaceutical
UR	University Requirements

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.

-University requirements -

Course Code	Course title	Credit hours
UR 111	Information Technology	2
UR 112	Human Rights and Fighting Corruption	1
UR 123	Psychology	1
Total		4

Faculty Requirements: See programme curriculum (Appendix 2)

Elective Courses:

The Faculty of Pharmacy offers elective courses from which the students are free to select eight credit hours.

Course Code	Course Title	Credit Hours		
		L	P	T
PT E13	Quality Assurances and GMP	1	1	2
PT E14	Applied Industrial Pharmacy	1	1	2
PT E15	Cosmetic Preparations	1	1	2
PG E08	Complementary and Alternative Medicine	1	1	2
PG E09	Marine Natural Products	1	1	2
PG E10	Chromatography and Separation Techniques	1	1	2
PC E09	Drug Targets	1	1	2
PO E09	Biological Standardization	1	1	2
PO E10	Veterinary Pharmacology	1	1	2
PA E06	Advanced Spectroscopic and Chromatographic Analytical Techniques	1	1	2
PM E07	Gene Regulation and Epigenetics	1	1	2
PM E08	Antimicrobial Stewardship	1	1	2
PM E09	Infection Control	1	1	2
PM E10	Bioinformatics	1	1	2
PB E05	Clinical Nutrition	1	1	2
PP E09	Pharmaceutical Care	1	1	2

L: Lecture,

P: Practical,

T: Total

The faculty Council may submit the electives courses of the examples which mentioned in the previous table at each level/semester, after taking the opinion of the councils of the competent scientific departments and the faculty can add

other electives courses which accepted by the University Council after the necessary justifications.

Distribution of courses to scientific departments

Each department of the faculty specializes in teaching the courses described in the couple of each and the department is responsible for preparing the scientific content for each course it teaches as well as supervising some other courses from outside the faculty as follows :

Department of Pharmaceuticals PT

#	Course Title	Code	Number of theoretical and practical hours per week		
			Theoretical	Practical	Total
1	Pharmacy Orientation	PT 101	1	-	1
2	Physical Pharmacy	PT 202	2	1	3
3	Pharmaceutics I	PT 303	2	1	3
4	Pharmaceutical Legislations and Regulatory Affairs	PT 304	1	-	1
5	Pharmaceutics II	PT 405	2	1	3
6	Pharmaceutics III	PT 506	2	1	3
7	Biopharmaceutics and Pharmacokinetics	PT 607	2	1	3
8	Pharmaceutics IV	PT 608	2	1	3
9	Pharmaceutical Technology I	PT 709	2	1	3
10	Pharmaceutical Technology II	PT 810	2	1	3
11	Good Manufacturing Practice	PT 011	1	1	2
12	Advanced Drug Delivery Systems	PT 012	2	-	2
13	Elective Course includes one of the following courses:-	EC			
	a) Quality Assurances and GMP	PT E13	1	1	2
	b) Applied Industrial Pharmacy	PT E14	1	1	2
	c) Cosmetic Preparations	PT E15	1	1	2
Total			21	9	30

PG Pharmacognosy Department

#	Course Title	Code	Number of theoretical and practical hours per week		
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			Theoretical	Practical	Total
1	Medicinal Plants	PG 101	2	1	3
2	Pharmacognosy I	PG 202	2	1	3
3	Pharmacognosy II	PG 303	2	1	3
4	Phytochemistry I	PG 404	2	1	3
5	Phytochemistry II	PG 505	2	1	3
6	Applied and Forensic Pharmacognosy	PG 606	2	1	3
7	Phytotherapy and Aromatherapy	PG 807	2	1	3
8	Elective Course includes one of the following courses:-	EC			
	a) Alternative Medicinal Therapies	PG E08	1	1	2
	b) Marine Natural Products	PG E09	1	1	2
	c) Chromatography and Separation Techniques	PG E10	1	1	2
Total			14	7	21

Medicinal Chemistry PC

#	Course Title	Code	Number of theoretical and practical hours per week		
			Theoretical	Practical	Total
1	Pharmaceutical Organic Chemistry I	PC 101	2	1	3
2	Pharmaceutical Organic Chemistry II	PC 202	2	1	3
3	Pharmaceutical Organic Chemistry III	PC 303	2	1	3
4	Pharmaceutical Organic Chemistry IV	PC 404	2	1	3
5	Drug Design and Metabolism	PC 505	1	1	2
6	Medicinal Chemistry I	PC 606	2	1	3
7	Medicinal Chemistry II	PC 707	2	1	3
8	Medicinal Chemistry III	PC 808	2	1	3
9	Elective Course	EC			
	Drug Targets	PC E09	1	1	2
Total			15	8	23

The Department of Medical Chemistry of the Faculty supervises the teaching of the following courses

	Course Title		Number of theoretical
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#		Code	and practical hours per week		
			Theoretical	Practical	Total
1	Communication Skills	NP 601	1	-	1
2	Scientific Writing	NP 802	1	-	1
Total			2	-	2

Pharmacology and Toxicology PO

#	Course Title	Code	Number of theoretical and practical hours per week		
			Theoretical	Practical	Total
1	Medical Terminology	PO 101	1	-	1
2	Pharmacology I	PO 502	2	1	3
3	Biostatistics	PO 503	1	-	1
4	Pharmacology II	PO 604	2	1	3
5	Pharmacology III	PO 705	1	1	2
6	Basic and Clinical Toxicology	PO 806	2	1	3
7	First Aid	PO 007	1	-	1
8	Drug Interaction	PO 008	1	-	1
9	Elective Course includes one of the following courses:-	EC			
	a) Biological Standardization	PO E09	1	1	2
	b) Veterinary Pharmacology	PO E10	1	1	2
Total			11	4	15

The Department of Pharmacology and Toxicology of the faculty supervises the teaching of the following courses

#	Course title	Code	Number of theoretical and practical hours per week		
			Theoretical	Practical	Total
1	Anatomy and Histology	MD 201	2	1	3
2	Physiology and Pathophysiology	MD 302	2	1	3
3	Pathology	MD 603	1	1	2
Total			5	3	8

Analytical Chemistry department PA

#	Course Title	Code	Number of theoretical and practical hours per week		
			Theoretical	Practical	Total
1	Pharmaceutical Analytical Chemistry I	PA 101	2	1	3
2	Pharmaceutical Analytical Chemistry II	PA 202	2	1	3
3	Pharmaceutical Analytical Chemistry III	PA 303	1	1	2
4	Instrumental Analysis	PA 404	2	1	3
5	Quality Control of Pharmaceuticals	PA 005	2	1	3
6	Elective Course	EC			
	Advanced Spectroscopic and Chromatographic Analytical Techniques	PA E06	1	1	2
Total			9	5	14

The Department of Analytical Chemistry of the Faculty :supervises the teaching of the following courses

#	Course Title	Code	Number of theoretical and practical hours per week		
			Theoretical	Practical	Total
1	Mathematics	MS 101	1	-	1
2	Human Rights and Fighting Corruption	UR 102	1	-	1
3	Psychology	UR 203	1	-	1
Total			3	-	3

Department of Microbiology and Immunology PM

#	Course Title	Code	Number of theoretical and practical hours per week		
			Theoretical	Practical	Total
1	General Microbiology and Immunology	PM 301	2	1	3
2	Pharmaceutical Microbiology	PM 402	2	1	3
3	Medical Microbiology	PM 503	2	1	3
4	Parasitology and Virology	PM 704	2	1	3
5	Pharmaceutical Biotechnology	PM 905	2	1	3
6	Public Health	PM 906	2	-	2
7	Elective Course includes one of the following courses:-	EC			
	a) Gene Regulation and Epigenetics	PM E07	1	1	2
	b) Antimicrobial Stewardship	PM E08	1	1	2
	c) Infection Control	PM E09	1	1	2
	d) Bioinformatics	PM E10	1	1	2
Total			12	5	17

The Department of Microbiology and Immunology of the Faculty supervises the teaching of the following courses: PM

#	Course Title	Code	Number of theoretical and practical hours per week		
			Theoretical	Practical	Total
1	Information Technology	UR 101	1	1	2
Total			1	1	2

Department of Biochemistry PB -7

#	Course Title	Code	Number of theoretical and practical hours per week		
			Theoretical	Practical	Total
1	Cell Biology	PB 201	1	1	2
1	Biochemistry I	PB 402	2	1	3
2	Biochemistry II	PB 503	2	1	3
3	Clinical Biochemistry	PB 704	2	1	3
4	Elective Course	EC			
	Clinical nutrition	PB E05	1	1	2
Total			7	4	11

The Department of Biochemistry of the Faculty supervises the teaching of the following courses

#	Course Title	Code	Number of theoretical and practical hours per week		
			Theoretical	Practical	Total
1	Marketing and Pharmacoeconomics	NP 903	2	-	2
2	Entrepreneurship	NP 904	1	-	1
Total			3	-	3

(Department of Clinical Pharmacy (PP -

#	Course Title	Code	Number of theoretical and practical hours per week		
			Theoretical	Practical	Total
1	Drug Information	PP 701	1	-	1
2	Community Pharmacy Practice	PP 802	2	1	3
3	Hospital Pharmacy	PP 903	1	1	2
4	Clinical Pharmacy I	PP 904	2	1	3
5	Clinical Pharmacokinetics	PP 905	2	1	3
6	Clinical Pharmacy II and Pharmacotherapeutics	PP 006	1	1	2
7	Clinical Research, Pharmacoepidemiology and Pharmacovigilance	PP 007	1	1	2
8	Professional Ethics	PP 008	1	-	1
9	Elective Course	EC			
	Pharmaceutical Care	PP E09	1	1	2
Total			11	6	17

Programme Curriculum

Table (1)

Semester (1)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks*				Total marks	Final Exam (hrs)
		Lect.	Pract.	Total		Period.	Pract.	Wr.	Oral		
Pharmaceutical Analytical Chemistry I	PA 101	2	1	3	Registration	15	25	50	10	100	2
Pharmaceutical Organic Chemistry I	PC 101	2	1	3	Registration	15	25	50	10	100	2
Medicinal Plants	PG 101	2	1	3	Registration	15	25	50	10	100	2
Pharmacy Orientation	PT 101	1	-	1	Registration	25	-	75	-	100	1
Medical Terminology	PO 101	1	-	1	Registration	25	-	75	-	100	1
Information Technology	UR 101	1	1	2	Registration	25	25	50	-	*	1
Mathematics	MS 101	1	-	1	Registration	25	-	75	-	100	1
Human Rights and Fighting Corruption	UR 102	1	-	1	Registration	25	-	75	-	*	1
Total		11	4	15						600	

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

*** The university requirement of Success and fail is not added to the student's quarterly and cumulative rate.**

Table (2)

Semester (2)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks*				Total marks	Final Exam (hrs)
		Lect.	Pract.	Total		Period.	Pract.	Wr.	Oral		
Pharmaceutical Analytical Chemistry II	PA 202	2	1	3	Pharmaceutical Analytical Chemistry I	15	25	50	10	100	2
Pharmaceutical Organic Chemistry II	PC 202	2	1	3	Pharmaceutical Organic Chemistry I	15	25	50	10	100	2
Cell Biology	PB 201	1	1	2	Registration	15	25	50	10	100	1
Pharmacognosy I	PG 202	2	1	3	Medicinal Plants	15	25	50	10	100	2
Anatomy and Histology	MD 201	2	1	3	Registration	10	25	65	-	100	2
Physical Pharmacy	PT 202	2	1	3	Registration	15	25	50	10	100	2
Psychology	UR 203	1	-	1	Registration	25	-	75	-	*	1
Total		12	6	18						600	

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

*** The university requirement of Success and fail is not added to the student's quarterly and cumulative rate.**

Table (3)

Semester (3)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total marks	Final Exam (hrs)
		Lect.	Pract.	Total		Period.	Pract.	Wr.	Oral		
Pharmaceutical Analytical Chemistry III	PA 303	1	1	2	Pharmaceutical Analytical Chemistry II	15	25	50	10	100	1
Pharmaceutical Organic Chemistry III	PC 303	2	1	3	Pharmaceutical Organic Chemistry II	15	25	50	10	100	2
Pharmacognosy II	PG 303	2	1	3	Pharmacognosy I	15	25	50	10	100	2
Pharmaceutics I	PT 303	2	1	3	Physical Pharmacy	15	25	50	10	100	2
Physiology and Pathophysiology	MD 302	2	1	3	Registration	15	25	50	10	100	2
General Microbiology and Immunology	PM 301	2	1	3	Registration	15	25	50	10	100	2
Pharmaceutical Legislations and Regulatory Affairs	PT 304	1	-	1	Registration	25	-	75	-	100	1
Total		12	6	18						700	

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

Table (4)

Semester (4)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total marks	Final Exam (hrs)
		Lect.	Pract.	Total		Period.	Pract.	Wr.	Oral		
Instrumental Analysis	PA 404	2	1	3	Pharmaceutical Analytical Chemistry III	15	25	50	10	100	2
Pharmaceutical Organic Chemistry IV	PC 404	2	1	3	Pharmaceutical Organic Chemistry III	15	25	50	10	100	2
Phytochemistry I	PG 404	2	1	3	Pharmacognosy II	15	25	50	10	100	2
Pharmaceutics II	PT 405	2	1	3	Pharmaceutics I	15	25	50	10	100	2
Biochemistry I	PB 402	2	1	3	Cell Biology	15	25	50	10	100	2
Pharmaceutical Microbiology	PM 402	2	1	3	General Microbiology and Immunology	15	25	50	10	100	2
Total		12	6	18						600	

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

Table (5)

Semester (5)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total marks	Final Exam (hrs)
		Lect.	Pract.	Total		Period.	Pract.	Wr.	Oral		
Drug Design and Metabolism	PC 505	1	1	2	Pharmaceutical Organic Chemistry IV	15	25	50	10	100	1
Phytochemistry II	PG 505	2	1	3	Phytochemistry I	15	25	50	10	100	2
Pharmaceutics III	PT 506	2	1	3	Pharmaceutics II	15	25	50	10	100	2
Biochemistry II	PB 503	2	1	3	Biochemistry I	15	25	50	10	100	2
Pharmacology I	PO 502	2	1	3	Physiology and Pathophysiology	15	25	50	10	100	2
Medical Microbiology	PM 503	2	1	3	Pharmaceutical Microbiology	15	25	50	10	100	2
Biostatistics	PO 503	1	-	1	Registration	25	-	75	-	100	1
Total		12	6	18						700	

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

Table (6)

Semester (6)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total marks	Final Exam (hrs)
		Lect.	Pract.	Total		Period.	Pract.	Wr.	Oral		
Medicinal Chemistry I	PC 606	2	1	3	Drug Design and Metabolism	15	25	50	10	100	2
Pharmacology II	PO 604	2	1	3	Pharmacology I	15	25	50	10	100	2
Applied and Forensic Pharmacognosy	PG 606	2	1	3	Phytochemistry II	15	25	50	10	100	2
Biopharmaceutics and Pharmacokinetics	PT 607	2	1	3	Pharmaceutics I	15	25	50	10	100	2
Pharmaceutics IV	PT 608	2	1	3	Pharmaceutics III	15	25	50	10	100	2
Pathology	MD 603	1	1	2	Anatomy and Histology	15	25	50	10	100	1
Communication Skills	NP 601	1	-	1	Registration	25	-	75	-	100	1
Total		12	6	18						700	

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

Table (7)

Semester (7)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total marks	Final Exam (hrs)
		Lect.	Pract.	Total		Period.	Pract.	Wr.	Oral		
Medicinal Chemistry II	PC 707	2	1	3	Medicinal Chemistry I	15	25	50	10	100	2
Pharmacology III	PO 705	1	1	2	Pharmacology II	15	25	50	10	100	1
Parasitology and Virology	PM 704	2	1	3	General Microbiology and Immunology	15	25	50	10	100	2
Clinical Biochemistry	PB 704	2	1	3	Biochemistry II	15	25	50	10	100	2
Pharmaceutical Technology I	PT 709	2	1	3	Pharmaceutics IV	15	25	50	10	100	2
Drug Information	PP 701	1	-	1	Pharmacology II	15	25	50	10	100	1
Elective Course I	EC 701	1	1	2	Registration	15	25	50	10	100	1
Total		11	6	17						700	

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

Table (8)

Semester (8)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total marks	Final Exam (hrs)
		Lect.	Pract.	Total		Period.	Pract.	Wr.	Oral		
Medicinal Chemistry III	PC 808	2	1	3	Medicinal Chemistry II	15	25	50	10	100	2
Phytotherapy and Aromatherapy	PG 807	2	1	3	Phytochemistry II	15	25	50	10	100	2
Basic and Clinical Toxicology	PO 806	2	1	3	Pharmacology III	15	25	50	10	100	2
Pharmaceutical Technology II	PT 810	2	1	3	Pharmaceutical Technology I	15	25	50	10	100	2
Community Pharmacy Practice	PP 802	2	1	3	Pharmacology I	15	25	50	10	100	2
Scientific Writing	NP 802	1	-	1	Registration	25	-	75	-	100	1
Elective Course II	EC 802	1	1	2	Registration	15	25	50	10	100	1
Total		12	6	18						700	

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

Table (9)

Semester (9)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total marks	Final Exam (hrs)
		Lect.	Pract.	Total		Period.	Pract.	Wr.	Oral		
Hospital Pharmacy	PP 903	1	1	2	Community Pharmacy Practice	15	25	50	10	100	1
Pharmaceutical Biotechnology	PM 905	2	1	3	Medical Microbiology	15	25	50	10	100	2
Clinical Pharmacy I	PP 904	2	1	3	Pharmacology I	15	25	50	10	100	2
Clinical Pharmacokinetics	PP 905	2	1	3	Biopharmaceutics and Pharmacokinetics	15	25	50	10	100	2
Public Health	PM 906	2	-	2	Medical Microbiology	25	-	75	-	100	2
Marketing and Pharmacoeconomics	NP 903	2	-	2	Registration	25	-	75	-	100	2
Entrepreneurship	NP 904	1	-	1	Registration	25	-	75	-	100	1
Elective Course III	EC 903	1	1	2	Registration	15	25	50	10	100	1
Total		13	5	18						800	

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

Table (10)

Semester (10)

Course Title	Course Code	Credit Hours			Prerequisite	Examination Marks				Total marks	Final Exam (hrs)
		Lect.	Pract.	Total		Period.	Pract.	Wr.	Oral		
Good Manufacturing Practice	PT 011	1	1	2	Pharmaceutical Technology II	15	25	50	10	100	1
Quality Control of Pharmaceuticals	PA 005	2	1	3	Instrumental Analysis	15	25	50	10	100	2
Advanced Drug Delivery Systems	PT 012	2	-	2	Biopharmaceutics and Pharmacokinetics	25	-	75	-	100	2
Clinical Pharmacy II and Pharmacotherapeutics	PP 006	1	1	2	Clinical Pharmacy I	15	25	50	10	100	1
First Aid	PO 007	1	-	1	Pharmacology III	25	-	75	-	100	1
Drug Interaction	PO 008	1	-	1	Pharmacology III	25	-	75	-	100	1
Clinical Research, Pharmacoepidemiology and Pharmacovigilance	PP 007	1	1	2	Clinical Pharmacy I	15	25	50	10	100	1
Professional Ethics	PP 008	1	-	1	Clinical Pharmacy I	25	-	75	-	100	1
Elective Course IV	EC 004	1	1	2	Registration	15	25	50	10	100	1
Total		11	5	16						900	

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

Article 3

Annex (19)

Course Content

PT 101 Pharmacy Orientation (1+0)

Mission of pharmacy, role of pharmacist in society and pharmacy careers, classification of medications, interpretation of prescriptions and medication orders, general dispensing procedure and factors affecting drug dosage, sources of drugs, different dosage forms and various routes of administration. In addition to the history of pharmacy practice in various civilizations

PT 202 Physical Pharmacy (2+1)

Physicochemical principles essential for the design and formulation of pharmaceutical products. Fundamental concepts of states of matter, phase equilibrium, colligative properties, isotonicity solubility, dissolution, partition coefficient, surface and interfacial phenomena, surface active agents, adsorption and its application in pharmacy and rheological behavior of dosage forms.

PT 303 Pharmaceutics I (2+1)

Study the system of weights, measures, mathematical expertise and pharmaceutical calculations requisite to the compounding, dispensing, and utilization of drugs in pharmacy practice. It is also concerned with all manufacturing formulations aspects, packaging, storage and stability of liquid dosage forms including solutions (aqueous and non-aqueous), suspensions, emulsions and colloids with emphasis on the technology and pharmaceutical rationale fundamental to their design and development. The incompatibilities occurring during dispensing are also considered.

PT 304 Pharmaceutical Legislations and Regulatory Affairs (1+0)

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 405 Pharmaceutics II (2+1)

Studying the structure and function of the skin, target area of treatment after

topical application to skin, basic principles of diffusion through membranes and factors affecting percutaneous absorption, enhancement of skin penetration, transdermal drug delivery systems (TDDS). It also describes the principles and techniques involved in the formulation and manufacturing of traditional dermatological semisolid dosage forms (creams, ointments, gels and pastes) and cosmetic products.

PT 506 Pharmaceutics III (2+1)

Kinetics of drug decomposition including rate and order of the reaction, determination of the half-life, expiry date and shelf-life by different methods, stability testing, and in-vitro possible drug/excipients interactions . It also describes the principles and techniques involved in the formulation, and manufacturing of solid dosage forms including powders, granules, tablets, capsules and suppositories.

PT 607 Biopharmaceutics and Pharmacokinetics (2+1)

Understanding of the relation between the physicochemical properties of the drug and its fate in the body. The course explores the principles of biopharmaceutics and strategies for enhancing drug delivery and bioavailability. Integration of knowledge gained from other courses is emphasized to design and assure the quality of drug products. Students will also be introduced to the principles of pharmacokinetics (absorption, distribution, metabolism and elimination). The concepts of bioequivalence, biowaivers and *in vitro-in vivo* correlations (IVIVC's) will be discussed along with different models of drug disposition. The course prepares students for their evolving role in utilizing pharmacokinetics to guide formulation, dosage-regimen design and optimizing drug usage.

PT 608 Pharmaceutics IV (2+1)

Study the principles of formulation, development, sterilization, packaging and quality control testing of pharmaceutical sterile drug products. Principles for calculation and manipulation of parenterals, ophthalmic preparations, vaccines and blood products are emphasized. The course also covers the basic principles of formulation, sterilization, packaging and applications of radiopharmaceuticals in pharmacy and medicine. An in depth study on the formulation, manufacturing, quality control testing and applications of aerosols and other inhalation products is also accentuated.

PT 709 Pharmaceutical Technology I (2+1)

Introduction to industrial pharmacy. It deals with the principles of various unit operations such as heat transfer, evaporation, drying, distillation, filtration,

centrifugation, crystallization and extraction. It focuses on the application of these unit operations in pharmaceutical industry with emphasis on the equipment and machines used during the production of different dosage forms.

PT 810 Pharmaceutical Technology II (2+1)

This course is a continuation of the study of the various unit operations in pharmaceutical industry with emphasis on size reduction, size separation, size analysis and size enlargement involved in the process development, scale-up and manufacturing of pharmaceutical drug products in industry (conventional / advanced nanotechnology based). In addition to the container/closure systems, some of the packaging processing methods are covered. Moreover, the vision about designing a quality product and its manufacturing process to consistently deliver the intended performance of the product to meet patient needs is discussed by applying Quality-by-Design principles.

PT 011 Good Manufacturing Practice (1+1)

Study the principles of the current good manufacturing practices (cGMP). It exposes students to all aspects of validation, calibration, inspection and the requirements for manufacturing facilities. It also provides students with a review of the process engineering, technology transfer, personnel management, training and hygiene, premises and contamination control, documentation and auditing, process deviation with emphasis on risk management, complaint handling and product recall theory.

PT 012 Advanced Drug Delivery Systems (2+0)

Study the insights and competencies related to the principles of pharmaceutical pre-formulation as a gateway to dosage forms design and formulation . Emphasis is placed on developing formulations based on the physical and chemical properties of the drug substance and the intended use of the drug product. The course also introduces the students to the formulation principles and applications of novel and targeted drug delivery systems by transforming proteins, genes, and other biotechnology driven compounds into therapeutic products. In addition to formulation aspects of biotechnology derived pharmaceuticals, it also covers the application of polymers and excipients to solve problems/issues concerning the optimization of absorption, selective transport, and targeting.

PT E13 Quality Assurances and GMP (1+1)

Quality control and assurance organization, analytical control, inspection control, documentation, environmental control, GMP regulations, and statistical

quality control.

PT E14 Applied Industrial Pharmacy (1+1)

Good manufacturing practice regulations and quality assurance with emphasis on process validation and sampling techniques.

PT E15 Cosmetic Preparations (1+1)

Definition and concepts, classification, hair, bath, fragrance, and make-up preparations, nail lacquers, shaving and after-shave preparations, skin care, anal hygiene products, anti-perspirants and deodorants, quality control tests and evaluation of cosmetic products.

PG 101 Medicinal Plants (2+1)

The aim of the course is to provide students with knowledge necessary to identify and prepare a crude drug from the farm to the firm. Students should acquire knowledge concerning dusting powders, plant cytology, physiology and medicinal leafy plants and their taxonomy. In this course, the student will study: importance of natural products, preparation of natural products-derived drugs including collection, storage, preservation and adulteration. The course will introduce the students to the different classes of secondary metabolites.

PG 202 Pharmacognosy I (2+1)

Based on the Egyptian flora and other floras of wild and cultivated medicinal plants that are used in the pharmaceutical, cosmetic and food industries in the global & Egyptian market. The course introduces students to some botanical drugs of leaves, flower, seeds, bark and wood origin. During the lectures and practical sessions, students learn to identify examples of these drugs in their entire and powdered forms. Student will learn about the major constituents, folk uses, clinically proven uses, benefits, precautions of those medicinal plants.possible herbal-drug interactions of selected examples of these drugs and to have an overview over their phytopharmaceuticals available on the market specially the Egyptian market.

PG 303 Pharmacognosy II (2+1)

After completion of the course the student should have the knowledge and skills that enable the student to differentiate between different organs of through their monographs. The course comprises the study of identification of different organs through their monographs. (fruits, herbs, subterranean organs, unorganized drugs in addition to drugs of marine and animal origin) , including identify their active constituents and adulterants describe micro- and macro-morphological characteristics, benefits and precautions of their medicinal uses., side effects and contraindications and to have an overview over their phytopharmaceuticals available on the market specially the Egyptian market.

PG 404 Phytochemistry I (2+1)

Based on complementary medicine and Egyptian medicinal plants that can be used as natural extracts, bioactive raw materials and phytochemical standards to serve the pharmaceuticals, cosmetics and food industries in Egypt. The course aims to gain students the knowledge and skills that enable them to understand, describe and deal with the chemistry of volatile oils, resins, miscellaneous terpenoids, bitters of plant or animal origin, carbohydrates and glycosides of plant or animal origin and different techniques used for their preparation, identification and determination. Also, the students should become aware of different chromatographic methods used for isolation and analysis of different plant constituents and their pharmacological actions and medicinal uses.

PG 505 Phytochemistry II (2+1)

Chemistry of alkaloids, tannins and antioxidants of plant, fungi or animal origin as well as techniques for their isolation, identification and determination in their respective sources. Finally, the course focuses on the structure activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features.

PG 606 Applied and Forensic Pharmacognosy (2+1)

The course aims to provide pharmacy students with sufficient knowledge concerning quality control from herbal aspects, sampling, structural, physical and analytical standards, purity, safety and adulteration of drugs and their detection. It also covers the modern chromatographic techniques employed for the evaluation of natural product and their products. It also provides the student with basic knowledge about the application of plant biotechnology for the production of pharmaceutically active materials. The course also include an overview on forensic

pharmacognosy including plants and their natural products that constitute health hazards, or intended for criminal uses to produce, abortion, loss of mental control, hallucination, heart arrest.. Also it includes the study of drug dependents, narcotics, analgesics psych energetics, euphoric. Mycotoxin as a serious threat to general health and safety of community, contamination of food material with poisonous fungi.

PG 807 Phytotherapy and Aromatherapy (2+1)

A guidelines for prescribing herbal medicinal drugs on the basis of the pharmacological properties of these drugs including therapeutic uses, mechanism of action, dosage, adverse reactions, contraindications & drug interactions. The course also allows students understand pharmacotherapeutic principles applied to the treatment of different diseases, pharmacovigilance and rational use of drugs. Also the student should understand the basis of complementary and alternative medicine with emphasis on herbal remedies, nutritional supplements, homeopathies, aromatherapy & their effect on maintaining optimum health and prevention of chronic diseases. It includes studying of medicinal plants portfolios in relation to Phytopharmaceuticals in Egyptian Market.

PG E08 Complementary and Alternative Medicine (1+1)

This course is intended to provide the student a diverse group of healing systems that are not presently considered to be part of mainstream medicine. Alternative medical systems built upon complete systems of theory and practice as homeopathy, traditional Chinese medicine (TCM), and Ayurveda. This course also deals with biological medicine, energy medicine, manual medicine, mind-body medicine which include, deep relaxation, guided imagery, prayer, support groups and yoga.

PG E09 Marine Natural Products (1+1)

This course include importance of marine kingdom as a source of bioactive natural products . Marine ecosystem, distribution and classification of marine species. Different types of marine plants (angiosperms and algae), classification and characteristics of major groups of algae. Brominated compounds, nitrogen compounds, amino acids, amines, sterols and sulphated polysaccharides. Microalgae, bacteria and fungi. Classification of Marine animals. Selected

bioactive metabolites from marine invertebrates. Marine sponges and tunicates, Marine toxins, Drug development from marine sources.

PG E10 Chromatography and Separation Techniques (1+1)

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.

PC 101 Pharmaceutical Organic Chemistry I (2+1)

Introduction to organic chemistry, chemical bonds, hybridization, representation of organic compounds, concepts of acidity and basicity, organic reactions and reactivity of covalent bonds, alkanes, alicyclics, alkenes, alkynes, alkyl halides, chemical reactions of alkyl halides: SN^1 , SN^2 , E^1 and E^2 , alcohols and ethers.

PC 202 Pharmaceutical Organic Chemistry II (2+1)

Electrophilic aromatic substitution reactions, orientation, phenols, carbonyl compounds including aldehydes, ketones, carboxylic acids, their derivatives, sulfonic acids and β -dicarbonyl compounds.

PC 303 Pharmaceutical Organic Chemistry III (2+1)

Aryl halides, nitro compounds, amines & diazonium compounds and polynuclear compounds. Stereochemical nomenclature & terminology, discussion of chirality (chiral carbons, biphenyls, etc.), nomenclature, 2-D representations (line drawings, Fischer projections, Haworth projections), stereochemical terminology for sugars, amino acids, identifying stereochemical relationships (enantiomers, diastereomers, epimers, etc.), stereochemical analysis: determination of relative and absolute configuration, polarimetry (optical activity, specific rotation, etc), stereochemistry of organic reactions, $SN2$ (inversion), elimination mechanisms ($E2$, Hoffmann), additions to alkenes (syn, anti, Diels-Alder), reactions which proceed with racemization, optical resolution, use of catalytic enzymes and Real-world applications, including chiral drugs, and their applications including carbohydrates, amino acids and proteins.

PC 404 Pharmaceutical Organic Chemistry IV (2+1)

Nomenclature and chemistry of organic heterocyclic compounds, five-membered

heterocycles, and its fused derivatives (pyrrole, thiophene, furan and its derivatives, indole, six-membered heterocycle pyridine and its fused derivatives including quinolines and isoquinolines. Structure elucidation of organic compounds using different spectroscopic techniques, IR spectroscopy, ¹H-NMR spectroscopy, ¹³C-NMR spectroscopy and mass spectroscopy.

PC 505 Drug Design and Metabolism (1+1)

Introduction, physicochemical parameters, methods of drug development, effect of substituents on drug activity, lead optimization, and computer aided drug design. Quantitative structure activity relationship (QSAR) and its applications to different drug classes and drug metabolism.

PC 606 Medicinal Chemistry I (2+1)

GIT drugs, antihistaminic, non-steroidal anti-inflammatory drugs, narcotic analgesics, local anesthetics, oral hypoglycemics, prostaglandins, thyroid and anti-thyroid.

PC 707 Medicinal Chemistry II (2+1)

Topical antimicrobials, antibiotics, sulphonamides, antitubercular drugs, antifungal agents, antiprotozoal agents, antimalarial agents, anthelmintic agents, antiviral agents, antineoplastic agents and urinary tract disinfectants.

PC 808 Medicinal Chemistry III (2+1)

Vitamins, central nervous system drugs including stimulants and depressants, cardiovascular drugs, diuretics, steroidal hormones and autonomic nervous system drugs.

PC E09 Drug Targets (1+1)

Drug targets including; lipids, proteins (enzymes and receptors) and nucleic acid as drug target. Drug target interactions, design of agonist and antagonist, physicochemical parameters in drug action, drug design types (structure based - ligand based), drug design strategies including; strategies to increase drug target interaction (pharmacodynamics parameters), strategies to increase drug access to the target (pharmacokinetic parameters). Antisense drugs and drugs acting on protein kinases.

PO 101 Medical Terminology (1+0)

Introduction to medical and pharmaceutical terminologies, medical abbreviations, medical idioms, suffixes and prefixes, medical terms pertaining to major body

systems.

PO 502 Pharmacology I (2+1)

The general principles of pharmacology are presented; such as pharmacokinetics, pharmacodynamics, receptor theory, drug interaction and principle of therapeutics. This course integrates principles of pharmacology with conceptual knowledge of physiology and pathophysiology to disease processes regarding the autonomic, neuromuscular and autacoids.

PO 503 Biostatistics (1+0)

Basic concepts of biostatistics and data analysis. Introduction to descriptive and inferential statistics, interpretation of estimates, confidence intervals and significance tests, elementary concepts of probability and sampling; binomial and normal distribution, basic concepts of hypothesis testing, estimation and confidence intervals, t-test and chi-square test, linear regression theory and the analysis of variance.

PO 604 Pharmacology II (2+1)

Study the principles of pharmacology with conceptual knowledge of physiology and pathophysiology disease processes regarding drugs acting on cardiovascular systems, central nervous system, gastro-intestinal tract, pulmonary systems and hematologic disorders. Antihyperlipidemic drugs are also included.

PO 705 Pharmacology III (1+1)

Integration of the principles of pharmacology with conceptual knowledge of Physiology and pathophysiology disease processes regarding drugs acting on endocrine system. Chemotherapeutic drugs including antimicrobials, anticancer and immunosuppressant are within the scope of the course. Stem cell therapy is also included. The anti-inflammatory, analgesics as well as gout treatments are also included.

PO 806 Basic and Clinical Toxicology (2+1)

This course provides basics and concepts of toxicology including the mechanism of toxicity, target organ and treatment of toxicity. Toxic groups including heavy metals, toxic gases, animal, plant and marine poisons, pesticides and radiation hazards are covered. Environmental, occupational, reproductive and genetic toxicology as well as drug abuse are included. Postmortem sampling for detection of poisons, methods of detection, interpretation of results and writing of a report are also covered.

PO 007 First Aid (1+0)

The course covers topics of basic life support and medical emergency of different situations including bleeding, shock, poisoning, bone fractures, soft tissue injuries, rescue and transportation. It includes: introduction to first aid ABCs, medical emergencies, effect of temperature, transportation of an injured casualty & first aid kit, respiratory emergencies, fractures and dislocations, bleeding and surgical emergencies, burns and scalds, animal bites or stings and poisoning.

PO 008 Drug Interaction (1+0)

Drug-drug, drug-chemical, drug-herb or drug-food interactions and their clinical significance as well as the application of that knowledge to minimize the risk and outcome of interactions. Different types of drug interaction including pharmaceutical interactions, pharmacokinetic interactions, pharmacodynamic interactions, herbal & food drug interactions, alcohol and smoking drug interactions, CNS drug interactions, interactions of cardiovascular acting drugs, interactions of anticoagulants, interactions of anti-infectives, interactions of antihistaminics & immune-based therapies, interactions of hormones, and drug-disease interactions. Major types of drug interactions (Pharmacokinetic, pharmacodynamic and pharmacogenic interactions) in the clinical setting, in addition to drug food and drug disease interactions. The course comprises digitalis drug interactions, anticoagulants, hypoglycemic interactions, antineoplastic drug interactions, antihypertensive interactions and anticonvulsant Interactions. Students will be expected to determine whether a given interaction is clinically significant or required pharmacist intervention, make rational, scientifically recommendations for management of drug interactions.

PO E09 Biological Standardization (1+1)

Introduction to concepts of screening and bioassay in the course of drug discovery. Testing for drug activities belonging to the following drug classes: central and autonomic nervous systems, cardiovascular system, hormones, analgesics, and anti-inflammatory drugs.

PO E10 Veterinary Pharmacology (1+1)

Commonly used veterinary biological and pharmaceutical preparations, general sanitary and management procedures for the prevention and control of livestock diseases, brief review of infectious diseases and animal parasites.

PA 101 Pharmaceutical Analytical Chemistry I (2+1)

Introduction to quantitative analysis, acid base titrations, different theories of acid

and base, detection of end point, applications of acid-base, non-aqueous titrations, precipitometric titrations, factors affecting solubility, solubility products, methods of detection of end point. Gravimetric analysis and its applications.

PA 202 Pharmaceutical Analytical Chemistry II (2+1)

Oxidation reduction reactions, factors affecting oxidation potential detection of end point in redox reactions, iodometric and iodimetric titrations and its applications, compleximetric titrations, introduction to compleximetry, factors affecting stability of complex, EDTA and non EDTA titrations, detection of endpoint and its applications.

PA 303 Pharmaceutical Analytical Chemistry III (1+1)

Introduction to spectrophotometry, UV-Visible spectroscopy and its applications. Electrochemical methods of analysis, conductimetry, potentiometry polarography, voltammetry and its applications.

PA 404 Instrumental Analysis (2+1)

Spectrofluorimetric methods, principal instrumentation, factors affecting fluorescence intensity and applications in pharmaceutical analysis. Atomic spectroscopy; principal and instrumentation. Chromatographic methods for analytical chemistry which includes: TLC, gel chromatography, column chromatography, HPLC, UPLC, TLC, gas chromatography, capillary electrophoresis.

PA 005 Quality Control of Pharmaceuticals (2+1)

Good analytical practice and sampling: introduction, sampling of pharmaceuticals and related materials, type of sampling tools, sampling plans. Documentation and validation of analytical methods according to ICH guidelines Q2 R1. Compendia testing, validation of analytical methods, data elements required for assay validation. Drug stability, stability studies and stability indicating methods. Drug stability, stability testing. Forced degradation studies, stability indicating assay methods for drugs according to ICH Q1 R2 Guidelines. Stress conditions for drug degradation according to ICH Q1 R2 Guidelines. Factors affecting drug degradation, drug expiration, drug withdrawal from the market. Pharmaceutical regulations according to FDA & EMA (European medicine agency) and ISO and BSI. Drug-excipient interactions and adduct formation; analytical techniques used

to detect drug-excipient compatibility, mechanism of drug-excipient interactions, examples. Official methods of analysis applied to raw materials and end products.

PA E06 Advanced Spectroscopic and Chromatographic Analytical Techniques

Advanced spectroscopic techniques including chemiluminescence and derivative spectrophotometry. Recent advances in chromatography including supercritical fluid chromatography, monolithic, fused core and sub 2 µm columns.

PM 301 General Microbiology and Immunology (2+1)

The course provides students with a combination of laboratory and theoretical experience exploring the general aspects of microbiology. It includes knowledge of microorganisms, their morphology, diversity, cell structure and function, cultural characteristics, growth, metabolism, role of microorganisms in infectious diseases and microbial pathogenesis. It also clarifies different mechanisms of transport across bacterial cell membrane, metabolic pathways and physiology of bacteria. The course also covers the principles of genetic characters including DNA and RNA structures, replication, different forms of mutation and mutagenic agents. It also explores the basic concepts microbial growth, cultivation and reproduction. Moreover it introduces the modern concepts of medical immunology, with an emphasis on host-parasite relationship, Non-specific and specific immunity, Mechanism of protective immunity. **Molecular and cellular immunology, including antigen and antibody structure, function and reaction between them, effector mechanisms, complement, and cell mediated immunity. Active and passive immunization.** Hypersensitivity and in vitro antigen-antibody reactions, immuno-deficiency disorders, autoimmunity and auto-immune disease, organ transplantation.

PM 402 Pharmaceutical Microbiology (2+1)

This course describes in detail the physical and chemical methods of bacterial eradication and how to effectively control microbial growth in the field of pharmaceutical industry/hospitals. It further describes the means of preservation of pharmaceutical products, as well as cosmetics, followed by the proper tests of quality control and sterility assurance. Sterilization, sterilization indicators, sterility testing, aseptic area, the microbiological quality of pharmaceuticals. Validation of

sterilization process. Moreover, it explains the different groups of antimicrobials, their mechanism of action and resistance of microbes to biocides. Microbiological evaluation of antiseptics, disinfectants and preservatives. Antibiotics, classification and mechanism of action, antiviral and antifungal agents, different classes of antibiotics including the new categories and new approaches to overcome bacterial resistance & antibiotics clinical abuse. Additionally, principles, methods and procedures of different quality control tests used for evaluation of safety, potency and palatability of pharmaceutical products of small and large molecules drugs (biologicals) including herbal drugs have to be taught. The standard pharmacopeia methods and procedures as well as international guidelines as WHO, EMA, TGA should be discussed.

PM 503 Medical Microbiology (2+1)

The course aims at studying microorganisms causing infectious disease in human beings. The infectious diseases, their ethology and clinical manifestation, routes of transmission, treatment and techniques in detection and identification of pathogenic microorganisms caused by Gram positive cocci & bacilli, Gram negative cocci & bacilli and mycobacteria of major significance to public health will be studied.

PM 704 Parasitology and Virology (2+1)

Part of this course will focus on parasitic infections of humans with knowledge concerning biological, epidemiological and ecological aspects of parasites causing diseases to humans. It concerns with different parasitological related diseases in in Egypt causing serious health problems. This part of the course will discuss medical helminthology, protozoology and entomology concerning their morphological features, life cycle, pathogenesis, clinical manifestations, different diagnostic techniques, the most recent lines of treatment and prevention with control strategy for each parasitic infection. Moreover, it also cover laboratory diagnosis of human parasitic infections. The other part of the course provides students with the essential knowledge to recognize the epidemiology, mechanisms of pathogenesis, clinical picture, methods of laboratory diagnosis, treatment, prevention and control measures of RNA and DNA viral infections in humans.

PM 905 Pharmaceutical Biotechnology (2+1)

The course aims to provide students with fundamentals, scope and applications in biotechnology through studying fermentation technology, upstream, downstream, scaling up and down processes, use of molecular techniques for production of recombinant products and other major biotechnological products, biotransformation, bioremediation, bioleaching, bio insecticides, bio surfactants and biopolymer production.

PM 906 Public Health (2+0)

This course aims at understanding all scientific disciplines required for health education and promotion directed to the community health. How epidemiology acts as the bases of public health actions will be taught. Detailed scientific information and practices programs will be provided for control of communicable, non-communicable diseases, improving mental, social, environmental, occupational, geriatric and family health, use of sufficient and balanced food and nutrition, supplying safe drinking water, treating and disposing wastes and proper intervention during disasters.

PM E07 Gene Regulation and Epigenetics (1+1)

Introduction to epigenetic control, epigenetic modifications and organization of the nucleus, dosage compensation, genomic imprinting and epigenetic reprogramming. The influence of the environment on epigenetic control, mechanisms of environmental influence on epigenetic control and trans generational epigenetic inheritance through the gametes and cancer epigenetics.

PM E08 Antimicrobial Stewardship (1+1)

Principles of antimicrobial use, optimal management of common infections, essential functions of ASP, antimicrobial stewardship interventions in the inpatient setting, convincing the C-Suite, quantifying antimicrobial use and its effects. Advanced ASP activities, antimicrobial stewardship in cancer and hematopoietic cell transplant patients, antimicrobial stewardship in long-term care, antimicrobial stewardship at the end of life.

Expanding stewardship into the small community hospital setting and antimicrobial

Resistance from a global perspective.

PM E09 Infection Control (1+1)

Prevention of urinary tract infection, prevention of surgical site infection, nosocomial pneumonia and prevention of catheter associated blood stream infection. Isolation precautions and use of personal protective equipment (PPE). The importance of hand hygiene. Disinfection and sterilization, prevention of multi-drug resistant organism (MDRO) in healthcare setting. Specimen collection, hospital laundry & waste management. Healthcare worker immunization program and management of occupational exposure.

PM E10 Bioinformatics (1+1)

Introduction to bioinformatics & online resources, working with single sequences (nucleotide & protein), sequence comparison & similarity searching, protein structures.

RNA structures, SNPs and haplotypes, phylogenetics & comparative genomics, data manipulation and presentation.

PB 201 Cell Biology (1+1)

The cell theory and cell structure (membranous and non-membranous organelles-cell inclusions and the nucleus-macromolecules of the cell). DNA and genetic code, cell cycle and control of cell number. From gene to protein (transcription, protein synthesis, folding of peptides). Transport of biomolecules across membranes cellular energetics-ions and voltages-intercellular communication.

PB 402 Biochemistry I (2+1)

Introduction, enzymes, chemistry and metabolism of carbohydrates, chemistry and metabolism of lipids and biological oxidation.

PB 503 Biochemistry II (2+1)

Chemistry and metabolism of proteins, chemistry and metabolism of nucleotides and DNA, molecular biology, hormones and minerals.

PB 704 Clinical Biochemistry (2+1)

Biochemical and pathophysiological changes and laboratory diagnostic markers for disorders of (endocrine glands, renal function, hepatic function and gastric function).

Mineral metabolism, plasma proteins and lipoproteins. Clinical enzymology and myocardial infarction. Electrolytes, blood gases and acid-base balance. Handling, preservation, storage and analysis of biological samples. Homeostasis and biochemical aspects of hematology and blood analysis. Urine analysis, tumor markers and recent diagnostic biomarkers.

PP E05 Clinical Nutrition: (1+1)

Fundamentals of nutrition, nutritional assessment, macro/micronutrients, nutritional aspects of pregnancy and lactation, nutrition and development and aging, obesity and eating disorders, nutritional aspects of diabetes, nutritional aspects of genetic disease, dietary fiber, antioxidants and health.

PP 701 Drug Information (1+0)

Concept of drug information and its need, types of drug information resources (primary, secondary and tertiary literature), computerized and online drug information, literature evaluation and critical appraisal, retrieval of information. It also aims at providing the students with the professional skills required to effectively and accurately answer medication-related questions in a systematic and evidence based approach.

PP 802 Community Pharmacy Practice (2+1)

Competencies and knowledge for the provision of quality pharmaceutical care in a community pharmacy setting aiming at improving use of medicines and therapeutic outcomes. Differentiation between minor and major ailments and responding to minor ailments with over-the-counter products. Concepts of patient assessment, counseling, and monitoring in community pharmacy and in outpatient care settings and introduces students to pharmaceutical care services for chronic-diseased outpatients and to psychosocial aspects in patient care. In addition, the course provides the students with competencies to promote the public health role of pharmacist including health promotion and disease prevention activities.

PP 903 Hospital Pharmacy (1+1)

Introduction to hospital pharmacy (definition and structure of hospital pharmacy, pharmacy-patient relationship, and basic general functions of hospital pharmacy).

structure, management and related activities on both technical and administrative levels in accordance with national and international established guidelines. Administrative services include: the pharmacy, the pharmacy and therapeutic committee and policy making, the hospital formulary, medication purchasing, distribution and dispensing systems. The pharmaceutical (technical) services include: preparation of Intravenous (IV) admixtures, total parenteral nutrition (TPN) fluids, renal dialysis fluids, dispensing and safe handling of radiopharmaceuticals, cytotoxic drugs, and medical gases.

PP 904 Clinical Pharmacy I (2+1)

Definition and concepts of clinical pharmacy and pharmaceutical care, and qualification to become a clinical pharmacy. Patient history, medication reconciliation, therapeutic planning and drug-related problems. Interpretation of clinical laboratory data and physical examination. Providing Medication Therapy management services. Principles of special care populations (geriatric, pediatric, renal and hepatic patients, obesity & pregnancy & lactation). The course also introduces the student to the principles of management and supportive care of oncological diseases, blood disorders and nutritional deficiencies.

PP 905 Clinical Pharmacokinetics (2+1)

Basic principles of pharmacokinetics and their application to the clinical setting. Single Intravenous bolus and oral kinetics, IV infusion, multiple IV bolus, short infusion & oral dosing, non-linear pharmacokinetics, pharmacokinetic models. Sources of variability in pharmacokinetics, dosage regimen and dosage adjustment in children, obese, elderly patients and chronic disease states. Therapeutic drug monitoring and pharmacogenomics approaches.

PP 006 Clinical Pharmacy II and Pharmacotherapeutics (1+1)

Principles of pharmacotherapeutics & management of the common disease states (e.g. cardiovascular diseases, gastrointestinal diseases, respiratory diseases, endocrine diseases, obstetrics and gynecology, rheumatic diseases, renal diseases, CNS diseases).

PP 007 Clinical Research, Pharmacoepidemiology and Pharmacovigilance (1+1)

Basic principles of clinical research, design of research studies, types of research studies, clinical trials, statistical presentation of research data and ethical guidelines in drug research. This course addresses a range of study designs and analytic techniques for observational studies on the utilization, safety, and

effectiveness of pharmaceuticals. Students will develop an understanding of how to plan, implement, analyze, and criticize pharmacoepidemiological studies. This course also provides the student's with understanding of pharmacovigilance importance, concept, processes, systems, global safety standards and regulations and reporting systems.

PP 008 Professional Ethics (1+0)

Professional ethics provides general principles and history of pharmacy ethics, general principles of medical ethics, conflicts of interests and its management pharmacists relationship with society and family, ethics in disaster, medication error, research ethics and animal ethics.

PP E09 Pharmaceutical Care (1+1)

Introduction & impact, subjective & objective information, assessment, drug therapy problems, adherence. Care plan, follow-up & evaluations, documentation & Presentation, SOAP note format, professionalism & ethics, medication safety, formal case presentation of pharmaceutical care plan, introduction to hospitals, health-system pharmacy and professionalism.

MD201 Anatomy and Histology (2+1)

Anatomy:-

Introduction to skeletal, muscular, and articular systems, fascia, nervous, cardiovascular, and lymphatic systems, digestive, respiratory, and urogenital systems, endocrine glands. Cytology: blood, liver, spleen, lung, kidney, lymph node, cardiac muscle, aorta, stomach, and intestine.

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, and central nervous system), endocrine glands, and eye.

MD 302 Physiology and Pathophysiology (2+1)

Physiology:-

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

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 603 Pathology (1+1)

Providing the knowledge and skills for common diseases affecting body organs and

system. It helps the student to understand the causes (etiology) of disease, the mechanisms of its development (pathogenesis) and the associated alterations of structure

(morphologic changes) and function (clinical manifestations and complications) to be

able to determine the most likely diagnosis of the disease.

UR 101 Information Technology (1+1)

Introduction to the world of computers and the concept of information technology including: number systems and data representation, computer system components: hardware & software, storage and input/output systems, Operating systems and Utility Systems, software applications. Also it gives an overview about computer networks and internet: data communication, transmission modes, transmission media, computer networks, internet protocol, and internet services. It practices some computer

applications in the laboratory such as Internet Access, word processing and power point. It gives students a practical experience on developing projects related to the specialty of each faculty.

UR 102 Human Rights and Fighting Corruption (1+0)

يغطي هذا المقرر الموضوعات التالية: حقوق الإنسان في القانون الجنائي، حق الإنسان في تغيير جنسيته أو التخلي عن إحدى جنسياته، المواثيق الدولية المتعلقة بحماية حقوق الإنسان، علاقة العولمة والتنمية بالحقوق الاقتصادية والاجتماعية والثقافية، الحقوق الاقتصادية والاجتماعية والثقافية للإنسان، حقوق الإنسان في الشريعة الإسلامية، حقوق المرأة في قانوني العمل والتأمين الاجتماعي، حقوق الإنسان في التقاضي، الحقوق المدنية والسياسية للإنسان.

UR 203 Psychology (1+0)

The course introduces different principles, theories and vocabulary of psychology as a science. The course also aims to provide students with basic concepts of social psychology, medical sociology and interpersonal communication which relate to

the pharmacy practice system that involves patients, pharmacists, physicians, nurses and other health care professionals.

NP 601 Communication Skills (1+0)

The course will help students develop necessary written and oral communication and presentation skills to improve inter- and intra-professional collaboration and communication with patients and other health care providers.

NP 802 Scientific Writing (1+0)

This course is designed to introduce students to the principles of good scientific writing, to be familiar with basic structure of scientific reports and research articles. It covers methods of paraphrasing, common mistakes in scientific writing, different writing styles, how to write a scientific report, proposal and manuscript, appropriate use of tables and figures in data presentation and evaluation of literature and information sources.

NP 903 Marketing and Pharmacoeconomics (2+0)

Pharmacoeconomics

The basic concepts of health economics, learning basic terms of health economics and understand key principles. Topics cover the economic mechanisms of health care markets as market failures, and government intervention. The course covers the key components of health care financing, and some methods of how to contain health care expenditure. Alongside the major definitions in health technology assessment, students should have an overview about different types of economic evaluation, budget impact analysis and their uses. Moreover, students should get familiar with different methods of pricing among which value-based pricing.

Marketing

The objective of this course is to introduce students to the concepts, analyses, and activities that comprise marketing management, and to provide practice in assessing and solving marketing problems. The course is also a foundation for advanced electives in Marketing as well as other business/social disciplines. Topics include marketing strategy, customer behavior, segmentation, market research, product management, pricing, promotion, sales force management and competitive analysis.

NP 904 Entrepreneurship (1+0)

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, with an emphasis on entrepreneurship.

MS 101 Mathematics (1+0)

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, and hypothesis testing.