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*** تم تعديل مسمى قسم الكيمياء العضوية طبقاً للقرار الوزاري رقم (٣٥٨) ٢٠١٢/٢/٨**

POSTGRADUATE DEGREE PROGRAMS

Graduate Diploma:

Cosmetics Products

Hospital Pharmacy

Industrial Pharmacy

Medicinal Plants

Toxicology and Forensic Chemical Analysis

* Pharmacology

* Pharmacovigilance

* Microbiology

Biotechnology

*Genomics and Bioinformatics

Pharmaceutical Raw Materials Synthesis Technology

Drug Quality Control and Assurance

Biochemical Analysis

* Drug Discovery

Doctor of Pharmacy

Master of Pharmaceutical Sciences:

Pharmaceutics

Industrial Pharmacy

Pharmacognosy

Pharmacology and Toxicology

Microbiology and Immunology

** Pharmaceutical Organic Chemistry

Analytical Chemistry

Biochemistry

Pharmaceutical Chemistry

Clinical Pharmacy

*** قرار وزاري رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

**** تم تعديل مسمى ماجستير العلوم الصيدلية (الكيمياء العضوية) طبقاً للقرار الوزاري رقم (١٨٩٦) ٢٠٠٨/٨/١٢ إلى ماجستير العلوم الصيدلية (كيمياء عضوية صيدلية) طبقاً للقرار الوزاري رقم (٢٠٠٤) ٢٠١٣/٨/١**

Doctor of Philosophy:

Pharmaceutics

Industrial Pharmacy

Pharmacognosy

Pharmacology and Toxicology

Microbiology and Immunology

** Pharmaceutical Organic Chemistry

Analytical Chemistry

Biochemistry

Pharmaceutical Chemistry

Clinical Pharmacy

General Regulations

POSTGRADUATE STUDIES
REGULATORY STATUTE

Faculty of Pharmacy – Cairo University

General Regulations

Article 1:

In compliance to the request of the Board of the Faculty of Pharmacy, Cairo University awards the following postgraduate Diplomas, and professional and scientific degrees:

1. Postgraduate Diplomas (specialized)
2. Doctor of Pharmacy degree (Pharm. D., professional)
3. Master degrees (M. Sc.) in Pharmaceutical Sciences (in the area of specialization)
4. Doctor of Philosophy degrees (Ph. D.) in Pharmaceutical Sciences (in the area of specialization)

Article 2:

The Board of the Faculty is allowed, based on Departmental Boards and Postgraduate Student and Research Affairs (PSRA) Committee approvals and upon consent of the University Board and that of the Supreme Council of Universities (SCU), to introduce new areas of specialization in programs concerning Diplomas, and M. Sc. and Ph.D. Degrees in the field of Pharmaceutical Sciences in order to meet current and future needs.

Admission and Registration

Article 3: Academic Year Calendar

The academic year begins in October for the full-time course-based programs offered at the faculty and is continued for 12 months. It consists of 2 semesters, the first starting in October and the second in April. Vacations are allowed at the end of the examinations periods, after each semester, and as determined by the Board of the Faculty.

Article 4: Application Calendar

Applications to postgraduate Diplomas, Pharm D. and M. Sc. programs, are submitted once a year, in July, to the PSRA Administration Office. Admission decisions are announced in September providing all supporting credentials are received and University fees paid.

Article 5: Admission Requirements

A. In addition to the particular requirements necessary for registration to Postgraduate Diplomas and Professional and Scientific Degrees mentioned in articles [21, 25, 31 and 38], applicants are admitted at the Faculty upon fulfillment of the following:

1. Acquisition of an approval from the concerned Departmental Board.
2. Submission of all requested credentials to the PSRA Administration Office [Baccalaureate certificate, Grades certificate, Military service status document (for males only) and Birth certificate]
3. Submission of an employment authority approval to pursue postgraduate studies in the selected program comprising an agreement to necessary dedication for its achievement and specifying the location for performance of laboratory experiments throughout the practical work of M. Sc. and Ph.D. candidates.

B. Additional admission requirements may be imposed by the individual Departmental Boards, if necessary. The number of admitted students is limited and based on available Departmental and Faculty facilities.

C. Appliance to more than one Diploma or degree program at a time is not allowed except upon approval of the PSRA University Board and as recommended by the Faculty Board after consultation of the concerned Departmental Board.

Article 6: Suspension of Admission / Registration

A. The Faculty Board may suspend the admission/ registration of any postgraduate student, as indicated by the concerned Departmental Board and the PSRA Committee.

B. Suspension is authorized for a length of time not exceeding 36 months; it should be annually renewed within the initial period designated for the program and is not allowed during the extension interval.

C. Authorized admission suspensions are allowed in case of withdrawal due to leave for: entering military service, traveling abroad in an official mission, health problems, delivery, child care or other reasons acceptable by the PSRA Committee and approved by the Faculty Board. Before or at the end of the suspension period, the student should submit a petition for readmission in the program.

D. The suspension period is excluded from the period designated for the program and with no tuition and fees.

Article 7: Cancellation of Admission / Registration

Relying on the PSRA Committee and concerned Departmental Board approvals, the Faculty Board may cancel the student admission / registration to a specific program based on articles [23, 29, 36 and 43].

Article 8: Readmission / Re-Registration

A. The Faculty Board may agree to readmit a student after at least a year from cancellation of his admission for any of the motives mentioned in articles [7, 23, 29, 36 and 43]. This based on approval of the PSRA Committee and concerned Departmental Board. The applicant should conform to all regulations and fulfill all the admission requirements of the particular program as mentioned in article [5].

B. The readmitted student in a M. Sc. program may be exempted from courses he already successfully completed providing this occurred within the last 5 years preceding readmission, and upon approval of the concerned Departmental Board and on consent of the Faculty Board.

Courses Regulations

Article 9: Curricula and Courses

A. The faculty adopts the credit hours system

B. The Departmental Boards are committed to provide a complete list of the courses they offer to postgraduate students with a full description of their content. The number of credit hours assigned for each course should be specified and the curricula approved by the PSRA committee prior submission to the Faculty Board.

C. The courses are distributed among the semesters as indicated for each program.

D. The Departmental Boards are allowed, on consent of the Faculty Board, to modify their own curricula or to offer new courses within the credit hour limits of each program.

Article 10: Course Encoding System

A. Postgraduate courses are encoded based on a four-digit system and classified at three levels:
1. Code 1000 courses for Diplomas and Pharm. D. degree.
2. Code 2000 courses for M. Sc. degrees.
3. Code 3000 courses for Ph. D. degrees.

B. Specialized courses are encoded by designating the program level by the thousands digit, followed by the code number of the department at the hundreds digit then that of the particular course at the tens and units digits.

C. Courses indicated as common faculty requisites for M. Sc. programs are designated by the code number 2 at the thousands digit followed by the course number at the tens and units digits. The hundreds digit is here zero.

D. Courses of code 2000 may be requested in Diploma programs, those of code 1000 in M.Sc. degrees and those of codes 1000 or 2000 or both in Ph. D. degrees.

Article 11: Credit hours

A. Each credit hour (i.e. unit) is equivalent to any of the following: a lecture of 1 hour / week, a laboratory session of 2 or 3 hours / week or Practice and Clinical Rotations of 6 hours / week, throughout the whole semester.

B. Each credit hour is assigned 50 marks during evaluation.

C. Each credit hour should be assessed by a written examination of at least 1 hour duration. Time allowed for any exam should not be shorter than 1 hour and not exceeding 3 hours for any of the taught courses.

Article 12: Transfer of credit

The Faculty Board may, upon recommendation from the interested Departmental Board and consent of the PSRA committee, approve a number of postgraduate credit transfers. This is applicable to courses successfully attended by the student, at any faculty or institute recognized by the Supreme Council of Universities (SCU), throughout the last 5 years preceding his admission to Diplomas, and Pharm. D. and M. Sc. degrees.

Article 13: Courses Registration Guidelines

A. Students enrolled in a specific program should register for required courses during the first 2 weeks of each semester.

B. Students may add / drop any course before the end of the second week of each semester. However, students have to bear in mind that they should register for courses representing a minimum of 2/3 the credit hours offered in each semester.

C. Students are eligible to withdraw from any course 4 weeks before the examinations start. No credit is earned for this officially withdrawn course. Its grade, designated by **W**, will remain on the transcript without affecting the Grade Point Average (GPA).

D. **(1)** Repeated registration for score improvement, in case of success in a particular course, is available. Student's grade points in all assessments will be included in computation of his CGPA.

(2) Re-registration in case of failure is allowed only twice for a particular course. Student's grade points in all assessments will be included in computation of his CGPA.

E. Students are permitted to register in courses held outside their departments, the faculty or university upon a request from their respective Departmental Boards submitted for approval to the Faculty Board. Grades obtained will be computed in the GPA providing this (these) course (s) meets (meet) the program requirements.

F. Students having attended less than 75% of the total hours specified for a particular course are subjected to a forced withdrawal. This based on the course instructor's report submitted to the Departmental Board and approved by the PSRA Committee and the Faculty Board. A probation notice is sent to the student through the PSRA Administration Office. The course is designated on the transcript by **FW** (forced withdrawal) and is considered as a failure (F).

Article 14: Examinations and Evaluation System

A. The first semester examinations are held in February and those of the second semester in September and in commitment with article [3].

B. The Faculty Board may consent to a student's petition (s) for course (s) withdrawal twice only during his enrollment in the program, providing this (these) being submitted before the examinations start. Petitions should be supported by a documented excusable motive acceptable by the PSRA committee and the Faculty Board [refer to article 14 C].

C. To succeed in a particular course, students must score at least 30% of the mark specified for the final written examination and 60% or better from the total mark specified for the course.

D. Students absent from the final exam of a particular course without an excusable accepted motive are graded **ABS** in that course and considered as failed (F).

E. Students failing to perform in a compulsory course (s) should repeat registration and examination at the same semester of the following academic year.

F. Students failing to perform in an elective course (s) may substitute this (these) course (s) by another (others). Credits earned in the selected new course (s) are those computed in the GPA.

G. Grade Points are numerical units used to evaluate the students' achievement standards that are expressed in term of marks. Therefore, results obtained for individual courses are given in points.

H. A four-point system of grading (4 points / credit hour), that includes (+) grades, is adopted. Grades are evaluated in terms of grade points as displayed below.

Grade Point Scale

Grade	Grade Point	Equivalent Percentile	Remarks
A	4	90-100	Very high caliber
B^+	3.5	85-< 90	
B	3	75-< 85	Satisfactory performance
C^+	2.5	70-< 75	
C	2	65-< 70	Unexpected performance
D	1	60-< 65	
F	0	< 60	Failure
ABS	0	-	Failure for absence
FW	0	-	Forced withdrawal
I	-	-	Incomplete requirements
S	-	-	Afforded for thesis credit after approval

I. The semester Grade Point Average (GPA) represents the courses (or credit hours) completed within this semester and is computed as follows:

$$GPA = \frac{\text{Sum of (Grade points of each course X Corresponding credit hours)}}{\text{Sum of credits hours completed in the semester}}$$

J. The Cumulative GPA (CGPA) is the average of all final grades obtained within an academic program.

K. Courses for which exemptions have been granted will not be included in the GPA computation, but those transferred for credit will be included. The GPA reported on the final transcript displays 2 decimals and is truncated not rounded. The official faculty GPA for postgraduate students is 2.00

L. Probation notices are addressed to students whose CGPA values have fallen below 2.00. A student on probation must raise his CGPA to a minimum of 2.00 within 2 semesters. Students with a CGPA below average (value = 1.00) will be dismissed from the program.

M. GPAs for postgraduate programs, their equivalent percentile and qualification standards are displayed below.

GPA	Equivalent percentile	Qualification Standard
4	90 -100	Excellent with Honor
3.5 - < 4	85 - < 90	Excellent
3 - < 3.5	75 - < 85	Very Good
2.5 - < 3	70 - < 75	Good
2.0 - < 2.5	65 - < 70	Acceptable
1 - < 2.0	60 - < 65	Probation notice

N. Other grade symbols displayed in the transcript and not included in computation of averages (GPA and CGPA) are:

1. **I** (Incomplete): approved extension of time to complete the final examination or other requirements of the course.
2. **W** (Authorized withdrawal): approved withdrawal without credit.
3. **DFR** (Grade temporarily deferred): used only in those research extending over more than one semester that are performed for preparation of thesis. At the end of the program the **DFR** for all semesters must be converted to an **S** (Satisfactory) or **U** (Unsatisfactory) grade.

Article 15: Academic Advisement

Academic Advisors are selected among the Staff Members by the concerned Departmental Board. They assist postgraduate students enrolled in course-based programs (Diplomas, Pharm. D and M. Sc.) in planning their study, and monitor their progress. They are further replaced by Dissertation (Thesis) Advisors in case of Ph. D. candidates and of those following a M. Sc. program upon achievement of their course requirements.

Research Thesis Regulations

Article 16: Research Thesis Advisement

A. Committee composition:

1. A Major Thesis Advisor (Professor or Assistant Professor at the concerned department) is appointed by the Faculty Board, as suggested by the Departmental Board and on consent of the PSRA Committee, to follow up and evaluate the scientific performance of the candidate up to the dissertation defense. He is assisted by Co-Advisors (Professors, Assistant Professors or Lecturers).
2. Lecturers are eligible as thesis co-advisers after a minimum 1 year from being assigned in that position (or having at least one research paper accepted for publication) in case of M. Sc. theses and 3 years (or having 2 papers with at least one published) in case of Ph. D. thesis.
3. The advising committee in case of M. Sc. theses consists of 3 members while that of Ph. D. thesis is composed of 4, when diverse laboratory investigations are required.

B. Co-Advisors selected from outside the university should not exceed in number the university advising members.

C. An international member may be annexed to the Thesis Advising Committee for students enrolled in a Scientific Channel Program.

D. Any academic staff member should not contribute in advising more than 10 theses at a time beside those prepared by demonstrators or teaching assistants (TAs) and including not more than 3 theses prepared by international students.

E. Single advisors of Ph. D. or M. Sc. theses should, in case of transfer or leave, submit full reports on the thesis (theses) they are advising and propose other advisors to the Departmental Board.

F. Transferred advisors remain as members of Advising Committees if their leave is after a calendar year of being assigned.

G. Advisors deceased after at least one year of being appointed in the committee conserve all financial and academic wrights corresponding to the duration of their advisement. The Departmental Board may, however, nominate other advisors.

H. In case a new member is annexed to the Advising Committee of a particular thesis, the Jury Committee could not be appointed before the elapse of 6 months, providing the time to student degree is still valid and permit this delay.

I. Staff members are not legible to contribute in thesis advising of relatives up to the 4^{th} degree or to participate in their Jury Committee. Staff members, if relatives up to the 4^{th} degree, are not allowed to co-advise the same postgraduate thesis.

Article 17: Modification in the Research Topic

The Departmental Board may, upon the Major Advisor's request, admit modification in the research topic of a thesis. This change may involve a concurrent reconstitution of the advising committee, and is allowed only once within 2 years from registration for the program. In this case, the date the modification is approved by the Faculty Board, upon consent of the PSRA Committee, is considered as the postgraduate student's new registration date.

Article 18: Research Thesis

A. Once the M. Sc. or Ph. D. student has completed the thesis he should give a seminar (comprising an open discussion in his area of research) focusing on the aims and goals of his thesis and demonstrating to what extend the research topic has been covered.

B. Once the dissertation is ready for defense, the Major Advisor refers to the Departmental Board his suggestions towards appointing the Thesis Jury Committee, this to be forwarded to the PSRA Committee then to the Faculty Board seeking for approval. This supported by the following credentials:

1. A validity report on the thesis signed by all the members of the Advising Committee.
2. A copy of the dissertation that conforms to the format specified by the faculty.

C. The student should submit, as well, to the Departmental Board the necessary documents that confirm the publication (or acceptance for publication) of at least one scientific manuscript from his research findings prior thesis defense. Only a recognized scientific journal or conference is acceptable.

Article 19: Thesis Jury Committee

A. The Thesis Jury Committee is appointed by the Faculty Board, as recommended by the concerned Departmental Board and on consent of the PSRA Committee. The Jury consists of at least 3 members, one of whom is the major advisor (or all the advisors counted as a single vote). The two others are selected among professors or assistant professors working at Egyptian Universities. In case of M. Sc. theses, at least one member should be from outside the Faculty; while for Ph.D. theses, at least one member should be from outside the University.

B. The Thesis Jury Committee is legible for a period of only 6 months starting from the date of approval of its appointment by the University Vice President for PSRA, and may be renewed only once or another committee is appointed.

C. The defense must be open to the academic community of the University. Individual reports about the thesis are separately prepared by the different members of the Jury. In addition, the Jury Committee as a whole prepares and submits a collective report signed by all the members of the Jury. All reports are forwarded to the Departmental Board, the PSRA Committee and the Faculty Board prior seeking for the consent of the University Board.

D. The Faculty Board may, as recommended by the Thesis Jury Committee, return the dissertation back to the student for revision, performance of corrections and fulfillment of any requirements or another dissertation may be requested.

E. The major advisor has to submit a report to the Departmental Board to ascertain the performance of corrections and fulfillment of all requirements indicated by the Thesis Jury Committee.

F. The degree is considered to be awarded from the date the Faculty Board has agreed the student's fulfillment of all degree requirements.

Postgraduate Diplomas

Article 20: Areas of Specialization

According to article [1], Cairo University, based on recommendation of the Faculty Board, awards postgraduate diplomas in the following area of specialization:

- Cosmetics Products
- Hospital Pharmacy
- Industrial Pharmacy
- Medicinal Plants
- Toxicology and Forensic Chemical Analysis
- * Pharmacology
- * Microbiology
- Biotechnology
- Pharmaceutical Raw Materials Synthesis Technology
- Drug Quality Control and Assurance.
- Biochemical Analysis
- * Drug Discovery

The graduation certificate awarded indicates the title of the diploma and the qualification standard acquired by the graduate.

Article 21: Admission Requirements

In addition to the minimum requirements mentioned in article [5], students are eligible for admission to postgraduate diplomas if they meet the following program requirements:

A. They should be holders of Baccalaureates in Pharmaceutical Sciences (B. Ph. Sc.) from any Faculty of Pharmacy affiliated to the Egyptian Universities (EU) or an equivalent degree granted by any institute recognized by the Supreme Council of Universities (SCU).

B. Holders of Baccalaureates in appropriate fields, other than Pharmacy, with a minimum grade "Good" may apply to the program providing the degrees are granted by any EU or equivalents are acquired from institutes recognized by the SCU. This is allowed in certain areas of study and as specified by the concerned Departmental Boards.

1. Holders of Baccalaureates in Agricultural Sciences (B. Sc. Agric.), in the following areas of specialization: Plant Sciences, Plant Production Sciences or General Agricultural Production, are admitted to the "Diploma of Medicinal Plants".This providing the degree is awarded by any EU or its equivalent is obtained from an institute recognized by the SCU.
2. Holders of Baccalaureates in Science (B. Sc.), in the following areas of specialization: Chemistry, Botany or Chemistry-Botany, are admitted to the "Diploma of Toxicology and Forensic Chemical Analysis". This providing the degree is awarded by any EU or its equivalent is obtained from an institute recognized by the SCU.
3. Holders of Medical Bachelor and Bachelor in Surgery degree (M. B. B. Ch.) from any EU or an equivalent degree from any other institute recognized by the SCU are admitted to the "*Diploma of Pharmacology ".
4. Holders of Medical Bachelor and Bachelor in Surgery degree (M. B. B. Ch.) or Bachelorin Veterinary Medical Sciences degree from any EU or an equivalent degree from any other institute recognized by the SCU are admitted to the "Diploma of Microbiology".

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5. Holders of Bachelor in Science (Microbiology), Bachelor in Engineering (B. Eng.) (Chemical Engineering) or Bachelor in Agricultural Sciences (Food Technology) degrees are admitted to the "Diploma of Biotechnology". This providing the degree is awarded by any EU or its equivalent is obtained from an institute recognized by the SCU.
6. Holders of Baccalaureates in Science in the following areas of specialization Chemistry or Applied Chemistry are admitted to the *"Diploma of Pharmaceutical Raw Materials Synthesis Technology", providing the degree is awarded by any EU or its equivalent is obtained from an institute recognized by the SCU.
7. Holders of Medical Bachelor and Bachelor in Surgery degree (M. B. B. Ch.) or Bachelor in Veterinary Medical Sciences or Bachelor in science (B. Sc.) degree in the following areas of specialization: Biochemistry, Chemistry-Biochemistry or Biochemistry-Nutrition are admitted to the *"Diploma of Biochemical Analysis". This providing the degree is awarded by any EU or its equivalent is obtained from an institute recognized by the SCU.

C. Applicants should have completed a minimum of one year in a position related to the area selected for study.

D. Students must devote full-time to their coursework study for an academic year.

Article 22: System of Study

A. The academic year in Diploma programs consists of 2 semesters with day instruction hours and according to the schedules indicated by the Faculty Administration.

B. Admitted students should, as stipulated by the Departmental Boards and on consent of the Faculty Board, accomplish a total of at least 27-32 credit hours as program requirements including coursework and research project.

C. Students enrolled in Diploma programs register for courses at the level 1000. However, certain courses at the level 2000 (specific to M. Sc. candidates) may be requested.

D. Students should submit individual research projects concerned with their area of specialization and dealing with a subject approved by the academic advisors appointed by the Departmental Boards.

E. Evaluation of students' performance in the different courses is carried out as mentioned in article [14 G].

F. Courses are offered for a particular Diploma by the concerned department upon admission of a minimum 5 applicants to the program.

Article 23: Cancellation of Admission / Registration

The Faculty Board may cancel students' admission in the following circumstances:

A. Failure to achieve all graduation requirements within 3 years from admission including intervals of authorized suspension.

B. Inability to pay the total tuition and fees assessed for the program

C. Submission of withdrawal requests from the program as discussed in article [7].

Doctor of Pharmacy Degree

Article 24: Area of Specialization

In compliance to article [1], Cairo University awards upon recommendation of the Board of the Faculty of Pharmacy, the Doctor of Pharmacy degree in the field of Clinical Pharmacy. This degree is professional and does not allow further enrollment in Ph. D. degrees.

Article 25: Admission Requirements

A. Applicants should have a Bachelor's degree in Pharmaceutical Sciences with a minimum grade "Very Good" from any EU or an equivalent degree from an institute recognized by the SCU.

B. Ideal candidates should have spent at least one year practicing in a profession directly related to patients.

C. Students must devote fulltime to their study for 2 calendar years.

Article 26: Program Guidelines

A. The professional curriculum leading to the Pharm. D. degree requires two years of fulltime study including course-work, practical and clinical training with a total of at least 72 credit hours.

B. The curricular course requirements are distributed over 2 years as follows:

1. The **1st year**: Applicants must register for specialized courses with a total of 36 credit hours over 2 semesters. Courses are of code 1900, as indicated by the Faculty Board upon suggestion of the Board of the Clinical Pharmacy Department.
2. The **2nd year**: Students must accomplish six Practice and Clinical Rotations (including a compulsory rotation) by which they earn a total of 36 credit hours. The duration of each rotation is 8 weeks at the rate of 6 practice hours / week.

C. Academic advisors are assigned by the Board of the Clinical Pharmacy Department to monitor students' performance during the course-work and Practice and Clinical rotations.

D. By the end of each rotation, the student must discuss a patient's case with his advisors.

E. Deadlines for earning a Pharm. D. degree are 2 calendar years at minimum and 3 at maximum from the date of registration for the program (consent of the Faculty Board), taking in consideration the intervals of authorized suspension.

Article 27: Examination and Evaluation

A. Student's performance is evaluated during the first academic year as mentioned in article [14].

B. Student's performance in the Practice and Clinical Rotations, during the second year, will be evaluated through assignment of short research work and quizzes, as well as discussion of patients' cases. The student should acquire an "acceptable" grade at minimum (65 - < 70 %) by the end of the assessment (i.e. should successfully complete the practical training).

Article 28: Graduation Requirements

The University Board, in compliance with the Faculty Board, the PSRA Committee and the concerned Departmental Board, awards the Pharm. D. degree upon fulfillment of the following requirements:

A. Elapse of at least 2 calendar years from date of registration for the program (consent of the Faculty Board).
B. Successful completion of 72 credit hours.

Article 29: Cancellation of Registration

The Faculty Board is allowed to cancel registration of Pharm. D. candidates in the following circumstances:

A. Failure of candidates to acquire a cumulative grade point average (CGPA) over 2.00.

B. Nonattendance of students to either course-work or Practice and Clinical Rotations; this based on advisors' reports and on approval of the concerned Departmental Board and the PSRA Committee.

C. Upon students' request for withdrawal according to article [7].

Master Degree in Pharmaceutical Sciences

Article 30: Areas of Specialization

According to article [1], Cairo University, based on recommendation of the Faculty Board, confers Master's degrees in the following areas of specialization:

- Pharmaceutics
- Industrial Pharmacy
- Pharmacognosy
- Pharmacology and Toxicology
- Microbiology and Immunology
- * Pharmaceutical Organic Chemistry
- Analytical Chemistry
- Biochemistry
- Pharmaceutical Chemistry
- Clinical Pharmacy

*** تم تعديل مسمى ماجستير العلوم الصيدلية (الكيمياء العضوية) طبقاً للقرار الوزاري رقم (١٨٩٦) ٨/١٢/ ٢٠٠٨ إلى ماجستير العلوم الصيدلية (كيمياء عضوية صيدلية) طبقاً للقرار الوزاري رقم (٢٠٠٤) ٨/١/ ٢٠١٣**

The graduation certificate awarded indicates the area of specialization.

Article 31: Admission Requirements

In addition to the minimum requirements, mentioned in article [5], applicants to M. Sc. degrees should meet the following program requirements:

A. They should be holders of Baccalaureates in Pharmaceutical Sciences (B. Ph. Sc.) with a minimum grade "Good" from any Faculty of Pharmacy affiliated to the EU or an equivalent degree granted by any institute recognized by the SCU. In addition to a minimum average grade "Very Good" in the undergraduate courses related to the area of specialization as determined by the concerned Departmental Board.

B. The Faculty Board, relying on Departmental Boards recommendations, may admit to the program holders of B. Ph. Sc. with grade "Acceptable" if they have successfully achieved a specialized Diploma with a final grade "Very Good" at any Faculty of Pharmacy affiliated to the EU or an equivalent degree granted by any institute recognized by the SCU.

C. The applicant should be wholly engaged in his study for a minimum of 2 days / week for 2 years.

Article 32: Program Deadlines

A. Students are eligible to graduate after a minimum of a year and half (18 months) from the date of approval of registration by the Faculty Board.

B. Students should fulfill all the degree requirements within a maximum of 5 years from registration; time spent on approved leave or absence (authorized suspension) will not count towards time to degree. Extension is allowed for a period of 2 calendar years at maximum upon request of the Major Advisor and in compliance with the concerned Departmental Board, the PSRA Committee, the Faculty Board and the University PSRA Board.

C. Students' registration to the thesis research topic should be no later than five years from completion of the Master's course-work requirements.

Article 33: System of Study

A. A total of at least 36 credit hours is required for M. Sc. degree including course-work and thesis.

B. Minimum course-work requirements range from 18-20 credit hours as indicated by the Faculty Board and upon suggestion of the Departmental Boards. 2000-level courses should be selected so as to include faculty requirement courses (compulsory, 6 credit hours) and specialized core courses (both compulsory and elective).

C. Students must complete a research thesis on a topic selected by the Major Advisors and approved by the concerned Departmental Boards, the PSRA Committee and the Faculty Board; 18 credit hours are earned for the research thesis.

Article 34: Advisement

A. In addition to items of article [16], advisors should annually submit a progress report on the student's performance to the Departmental Board.

B. The faculty Board is allowed to modify the Advising Committee by either deletion or annexment or both, as suggested by the Major Advisor and upon approval of the Departmental Board and the PSRA Committee, and in agreement with article [16].

C. In case of transfer or leave of an advisor for a period exceeding a calendar year, the Faculty Board may modify the Advising Committee by annexing a new member or deletion of the transferred one if his leave is before the elapse of a calendar year from being assigned. This, as recommended by the Departmental Board and on approval of the PSRA Committee and in agreement with article [16].

Article 35: Graduation Requirements

The University Board, in compliance with the Faculty Board, the PSRA Committee and the concerned Departmental Board, awards the M. Sc. degree upon fulfillment of the following requirements:

A. Elapse of one and half calendar year (18 months) at minimum from the date of registration (consent of the Faculty Board for registration).

B. Successful completion of the course-work requirements with a minimum CGPA 2.00

C. Acceptance of the research thesis by the Jury Committee.

Article 36: Cancellation of Registration

The Faculty Board is allowed to cancel registration for M. Sc. programs in the following circumstances:

A. Upon student's request and in compliance to article [7].

B. Student's failure in accomplishing the course-work examinations (CGPA below 2.00).

C. Student's nonattendance or unsatisfactory progress in research work being reported by the advisors to the Departmental Board and forwarded to the PSRA Committee for approval of cancellation.

D. Dissertation refusal by the Jury Committee for 2 consecutive times.

E. Incapability of the student to graduate by the deadlines indicated in article [32 A & B].

F. Inability to pay all financial requirements.

Doctor of Philosophy Degree in Pharmaceutical Sciences

Article 37: Areas of Specialization

According to article [1], Cairo University, based on recommendation of the Faculty Board, confers Doctor of Philosophy degrees in the following areas of specialization:

- Pharmaceutics
- Industrial Pharmacy
- Pharmacognosy
- Pharmacology and Toxicology
- Microbiology and Immunology
- * Pharmaceutical Organic Chemistry
- Analytical Chemistry
- Biochemistry
- Pharmaceutical Chemistry
- Clinical Pharmacy

***تم تعديل مسمى ماجستير العلوم الصيدلية (الكيمياء العضوية) طبقاً للقرار الوزاري رقم (١٨٩٦) ٢٠٠٨/١٢/٨ إلى ماجستير العلوم الصيدلية (كيمياء عضوية صيدلية) طبقاً للقرار الوزاري رقم (٢٠٠٤) ٢٠١٣/٨/١**

The graduation certificate awarded indicates the area of specialization.

Article 38: Registration Requirements

A. Registration for Ph. D. in Pharmaceutical Sciences programs is allowed throughout the year.

B. Applicants to doctoral degrees must be holders of M. Sc. degrees in Pharmaceutical Sciences in the same area of specialization from any faculty affiliated to EU or of an equivalent degree granted by any institute recognized by the SCU.

Article 39: Program Deadlines

A. The minimum time required for earning a Ph. D. degree is 2 calendar years from the date of registration to the program (consent of the Faculty Board).

B. The maximum time allowed for earning the degree is 5 calendar years from the registration date. Time intervals spent on authorized suspension are to be excluded from time towards degree. Registration may be extended upon Advisors' request and on approval of the concerned Departmental Board, the PSRA Committee and the Faculty Board.

Article 40: Advisement

This is performed as indicated in articles [16] and [34]

Article 41: Program Guidelines

A. In addition to the general requirements mentioned in article [5], Doctorate candidates must fulfill the following:

1. Take the Test of English as a Foreign Language [TOEFL] with a minimum score 450 (paper-based), or submit a certificate of success in the test within 4 years from registration to the program.
2. Submit a proof of acquiring the International Computer Driving License [ICDL].

B. The research thesis is counted for 60 credit hours, and is performed on a topic selected by the Major Advisor and approved by the concerned Departmental Board and further by the PSRA Committee.

C. The Doctorate candidate must then submit a dissertation displaying its research findings which should be novel in the area of specialization and within the deadlines to degree mentioned in article [39 B].

D. The Departmental Boards may, upon consent of the PSRA Committee and the Faculty Board, impose specialized (elective) courses of Level 3000 with a maximum of 16 credit hours which will be counted in the program credits. The candidates must successfully pass the courses examinations with a minimum GPA 2.00.

Article 42: Graduation Requirements

The University Board, in compliance with the Faculty Board, the PSRA Committee and the concerned Departmental Board, awards the Ph. D. degree upon fulfillment of the following requirements:

A. Elapse of minimum of 2 calendar years from the date of registration to the program (consent of the Faculty Board).

B. Approval of the research thesis by the Jury Committee and its recommendation for awarding the degree.

Article 43: Cancellation of Registration

The Faculty Board is allowed to cancel registration of candidates for Ph. D. programs in the following circumstances:

A. Student's leave or unsatisfactory progress in research work as reported by the advisors to the Departmental Board and forwarded to the PSRA Committee for approval of cancellation.

B. Refusal of dissertation by the Jury Committee for 2 consecutive times.

C. Student's failure to graduate by the deadlines indicated in article [39 B].

D. Inability to pay all financial requirements.

E. In compliance to student's request for withdrawal from the program.

Article 44:

The annexed tables display: the postgraduate programs offered by the faculty, the curricula of the postgraduate diplomas in the different areas of specialization and those of the Pharm. D. and Master degrees course-work. The number of credit hours, examinations system (written, practical and oral) and maximal marks for each course are also indicated.

Continuing Education

Article 45: Program Guidelines

A. The Faculty Board may upon suggestion of the different Departmental Boards consent to hold training sessions or seminars at the postgraduate level to provide continuous innovative pharmacy education to practicing pharmacists and professionals holding necessary recognized degrees.

B. National and international scientific associations, as well as interested organizations and institutions may participate in the training sessions and seminars arrangement.

C. Participants in these sessions or seminars may be granted non-degree certificate proofs.

Transitional Regulation

Article 46:

These regulations will be applied to postgraduate students admitted after issuance of a ministerial decree approving this statute. Applicants admitted earlier will follow the regulations adopted at the date of registration.

Postgraduate Programs Offered by the Scientific Departments

POSTGRADUATE DEGREE PROGRAMS

Graduate Diploma:

Cosmetics Products

Hospital Pharmacy

Industrial Pharmacy

Medicinal Plants

Toxicology and Forensic Chemical Analysis

* Pharmacology

* Pharmacovigilance

* Microbiology

Biotechnology

*Genomics and Bioinformatics

Pharmaceutical Raw Materials Synthesis Technology

Drug Quality Control and Assurance

Biochemical Analysis

* Drug Discovery

Doctor of Pharmacy

Master of Pharmaceutical Sciences:

Pharmaceutics

Industrial Pharmacy

Pharmacognosy

Pharmacology and Toxicology

Microbiology and Immunology

** Pharmaceutical Organic Chemistry

Analytical Chemistry

Biochemistry

Pharmaceutical Chemistry

Clinical Pharmacy

*** قرار وزاري رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

**** تم تعديل مسمى ماجستير العلوم الصيدلية (الكيمياء العضوية) طبقاً للقرار الوزاري رقم (١٨٩٦) ٢٠٠٨/٨/١٢ إلى ماجستير العلوم الصيدلية (كيمياء عضوية صيدلية) طبقاً للقرار الوزاري رقم (٢٠٠٤) ٢٠١٣/٨/١**

Doctor of Philosophy:

Pharmaceutics

Industrial Pharmacy

Pharmacognosy

Pharmacology and Toxicology

Microbiology and Immunology

** Pharmaceutical Organic Chemistry

Analytical Chemistry

Biochemistry

Pharmaceutical Chemistry

Clinical Pharmacy

Department of Pharmaceutics and Industrial Pharmacy

Code No.[1]

Program	Program Code	Specializations
[Diploma] دبلـــوم	1100	١-مستحضرات التجميل **1- Cosmetic Products** ٢- صيدلة المستشفيات **2- Hospital Pharmacy** ٣- الصيدلـــة الصناعـــية **3- Industrial Pharmacy**
[M. Sc.] ماجستير	2100	١- صيدلانيـــــــات **1- Pharmaceutics** ٢-صيدلـــة صناعـــية **2- Industrial Pharmacy**
[Ph. D.] دكتـــوراه	3100	١- صيدلانيـــــــات **1- Pharmaceutics** ٢- صيدلـــة صناعـــية **2- Industrial Pharmacy**

Department of Pharmacognosy

Code No.[2]

Program	Program Code	Specializations
[Diploma] دبلـــوم	1200	النباتـــات الطبيـــة **Medicinal Plants**
[M. Sc.] ماجستير	2200	عقـــاقـــــــــير **Pharmacognosy**
[Ph. D.] دكتـــوراه	3200	عقـــاقـــــــــير **Pharmacognosy**

Department of Pharmacology and Toxicology

Code No.[3]

Program	Program Code	Specializations
[Diploma] دبلـــوم	1300	١- السموم والتحليل الكيميائى الشرعى **1- Toxicology and Forensic Chemical Analysis** ٢- * علم الأدويــة **2- Pharmacology** ٣- ** اليقظة الدوائية **3-Pharmacovigilance**
[M. Sc.] ماجستير	2300	أدويــة وسمــوم **Pharmacology and Toxicology**
[Ph. D.] دكتـــوراه	3300	أدويــة وسمــوم **Pharmacology and Toxicology**

*** قرار وزارى رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

**** قرار وزاري رقم (٤٠٥٧) بتاريخ ٢٠١٦/٩/١**

Department of Microbiology and Immunology

Code No.[4]

Program	Program Code	Specializations
[Diploma] دبلـــوم	1400	١- * ميكروبيولوجيا **1- Microbiology** ٢- التكنولوجيا الحيوية **2- Biotechnology** ٣- ** علم الجينوم والمعلوماتية الإحيائية **3- Genomics and Bioinformatics**
[M. Sc.] ماجستير	2400	ميكروبيولوجيا ومناعة **Microbiology and Immunology**
[Ph. D.] دكتـــوراه	3400	ميكروبيولوجيا ومناعة **Microbiology and Immunology**

*** قرار وزارى رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

**** قرار وزاري رقم (٥٦٨١) بتاريخ ٢٠١٦/١١/١٤**

Department of Pharmaceutical Organic Chemistry

Code No.[5]

Program	Program Code	Specializations
[Diploma] دبلـــوم	1500	* تكنولوجيا تخليق الخامات الدوائية **Pharmaceutical Raw Materials Synthesis Technology**
[M. Sc.] ماجستير	2500	** كيمياء عضوية صيدلية **Pharmaceutical Organic Chemistry**
[Ph. D.] دكتـــوراه	3500	** كيمياء عضوية صيدلية **Pharmaceutical Organic Chemistry**

*** قرار وزارى رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

**** تم تعديل مسمى درجة الماجستير و درجة دكتور الفلسفة فى العلوم الصيدلية (الكيمياء العضوية) طبقاً للقرار الوزارى رقم (١٨٩٦) ٨/١٢/ ٢٠٠٨ إلى درجة الماجستير و درجة دكتور الفلسفة فى العلوم الصيدلية (كيمياء عضوية صيدلية) طبقاً للقرار الوزارى رقم (٢٠٠٤) ٨/١/ ٢٠١٣**

Department of Analytical Chemistry

Code No.[6]

Program	Program Code	Specializations
[Diploma] دبلوم	1600	رقابة الأدوية وتأكيد الجودة **Drug Quality Control and Assurance**
[M. Sc.] ماجستير	2600	كيمياء تحليلية **Analytical Chemistry**
[Ph. D.] دكتوراه	3600	كيمياء تحليلية **Analytical Chemistry**

Department of Biochemistry

Code No.[7]

Program	Program Code	Specializations
[Diploma] دبلـــوم	1700	* التحليل الكيميائى الحيوية **Biochemical Analysis**
[M. Sc.] ماجستير	2700	كيمياء حيوية **Biochemistry**
[Ph. D.] دكتـــوراه	3700	كيمياء حيوية **Biochemistry**

*** قرار وزارى رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

Department of Pharmaceutical Chemistry

Code No.[8]

Program	Program Code	Specializations
[Diploma] دبلـــوم	1800	* إكتشاف الأدوية **Drug Discovery**
[M. Sc.] ماجستير	2800	كيمياء صيدلية **Pharmaceutical Chemistry**
[Ph. D.] دكتـــوراه	3800	كيمياء صيدلية **Pharmaceutical Chemistry**

*** قرار وزارى رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

Department of Clinical Pharmacy

Code No.[9]

Program	Program Code	Specializations
[Pharm. D.] دكتور الصيدلة	1900	صيدلة إكلينيكية **Clinical Pharmacy**
[M. Sc.] ماجستير	2900	صيدلة إكلينيكية **Clinical Pharmacy**
[Ph. D.] دكتـــوراه	3900	صيدلة إكلينيكية **Clinical Pharmacy**

Postgraduate Programs Courses and Description

Courses of Specialized Diploma Programs

Diploma of Cosmetic Products

The candidate studies (9) compulsory courses and presents (1) research project as shown in the following table:

Semester	Code No.	Course Title	Credit Hours	Exam. Hours			Exam. Marks		
				Written	Practical	Oral*	Written	Practical	Oral
First	1101	Technology of Cosmetic products (I). تكنولوجيا مستحضرات التجميل (I).	[3+2]	3	5	1	150	75	25
	1102	Medical Studies. دراسات طبية.	[2+0]	2	--	--	100	--	--
	1211	Natural Products in Cosmetics. المنتجات الطبيعية فى مستحضرات التجميل.	[2+1]	2	3	1	100	35	15
	2002	Pharmaceutical Statistics. الإحصاء الصيدلى.	[2+0]	2	--	--	100	--	--
Second	1103	Technology of Cosmetic Products (II). تكنولوجيا مستحضرات التجميل (II).	[3+2]	3	5	1	150	75	25
	1104	Research Project. مشروع بحثى.	[0+2]	--	--	--	--	--	100
	1105	Laws and Legislations (Cosmetic). القوانين والتشريعات (تجميل)	[1+0]	1	--	--	50	--	--
	1106	Quality Assurance and Control of cosmetics. تأكيد ورقابة الجودة لمستحضرات التجميل.	[3+1]	3	3	1	150	30	20
	1107	Packaging and Packaging Materials. التغليف والمواد المستخدمة للتغليف.	[1+0]	1	--	--	50	--	--
	1421	Microbial Quality Control.(Cosmetics) رقابة الجودة ميكروبيولوجياً.(مستحضرات التجميل)	[1+1]	1	3	--	50	50	--
Total credit hours required			27						

*** Oral Setting**

Course Content of Diploma of Cosmetic Products

Code No. & Credit Hours	Course Title and Content
1101 **(3+2)**	**Technology of Cosmetic Products (I):** **تكنولوجيا مستحضرات التجميل(I)** Raw materials, skin products as emollients, tonics, astringents, skin – whitening Products, insect repellents, formulations as creams, lotions, sprays, aerosols and other liquid and solid dosage forms. Also, tooth care products. **Practical Course: -**Includes practical application for theoretical course.
1211 **(2+1)**	**Natural Products in Cosmetics:** **المنتجات الطبيعية فى مستحضرات التجميل** Natural products used in cosmetics as oils, Perfumes, natural dyes: composition and its sources. Plant extracts used in cosmetics Preparations Identification and evaluation of natural components in different formulations. Stability Studies for natural ingredients in cosmetic preparations. Safety of use of natural products in cosmetical formulations. **Practical Course: -**Includes practical application for theoretical course.
1102 **(2+0)**	**Medical Studies:** **دراسات طبية** Histology and physiology of skin, effects of cosmetics preparations on skin cells. Side effects of cosmetics causes of skin irritation. In–vivo experiments on volunteers. Experimental design and analysis of data. psychological effects of use of cosmetics.
2002 **(2+0)**	**Pharmaceutical Statistics:** **الإحصاء الصيدلى** Normal and binomial distribution. Probability, use of factorials, combinations and permutations. Measuring of central tendency and various distribution modes for pharmaceutical data. Significance. Testing, sampling procedures and outliers. T-test, ANOVA, line statistics, correlation and regression.
1103 **(3+2)**	**Technology of Cosmetic Products (II):** **تكنولوجيا مستحضرات التجميل (II)** Hair care product as shampoos, hair colorants, Hair combing products Eye care products as mascara, eye shadows Nail care products. Foot care products. **Practical Course:-**Includes practical application for theoretical course.
1104 **(0+2)**	**Research Project:** **مشروع بحثى** Choosing research subject of potential item in specialty.

1105 **(1+0)**	**Laws and Legislations (Cosmetics):** **القوانين والتشريعات (مستحضرات تجميل)** - Study of the law no. 127 issued in 1955 for pharmacy profession and its modification [Community and private pharmacy, Drug companies, Drug stores, Medicinal herbs, etc.… and also with registration and distribution]. - Law of construction of cosmetics factories. Auditing procedures Control of industrial work by the responsible authorities. Rules of registration, and control on cosmetics preparations. Rules regulating importing and toll manufacturing.
1106 **(3+1)**	**Quality assurance and Control of cosmetics:** **تأكيد ورقابة الجودة لمستحضرات التجميل** Quality variation in cosmetic industry, sources of quality variation, quality control and quality assurance, GMP in cosmetic industry Quality tests for different cosmetic preparations including in – vitro and in vivo tests on animals and volunteers. **Practical Course: -**Includes practical application for theoretical course.
1107 **(1+0)**	**Packaging and Packaging Materials:** **التغليف والمواد المستخدمة للتغليف** Packaging materials: glass, plastic, rubber. Packaging techniques, considering cosmetics.
1421 **(1+1)**	**Microbial Quality Control (Cosmetics):** **رقابة الجودة ميكروبيولوجياً(مستحضرات التجميل)** Microbial control of raw materials and during manufacture of cosmetics and toiletries. Evaluation of preservatives in cosmetics and challenge tests. New methodology of microbiological quality control and assurance. **Practical Course: -**Includes practical application for theoretical course.

Diploma of Hospital Pharmacy

The candidate studies (13) compulsory courses and presents (1) research project as shown in the following table:

Semester	Code No.	Course Title	Credit Hours	Exam. Hours			Exam. Marks		
				Written	Practical	Oral*	Written	Practical	Oral
First	1108	Sterile Dosage Forms and Radio-pharmaceuticals. المستحضرات العقيمة والمواد الصيدلية المشعة.	[2+1]	2	3	1	100	35	15
	1109	Hospital Pharmacy Administration. إدارة صيدلة المستشفيات.	[2+1]	2	3	--	100	35	15
	1110	Hospital Pharmacy Practice. ممارسة صيدلة المستشفيات.	[2+1]	2	3	1	100	35	15
	1111	Drug Interactions. تفاعلات الأدوية.	[1+0]	1	--	--	50	--	--
	1710	Clinical Laboratory Analysis. تحاليل طبية.	[1+0]	1	--	--	50	--	--
	2002	Pharmaceutical Statistics. الإحصاء الصيدلي.	[2+0]	2	--	--	100	--	--
Second	1112	Research Project. مشروع بحثي.	[0+2]	--	--	--	--	--	100
	1113	New Drug Delivery Systems. أنظمة جديدة لتوصيل العقار.	[3+1]	3	3	1	150	30	20
	1114	Drug Information. معلومات الأدوية.	[1+0]	1	--	--	50	--	--
	1115	Advanced Clinical Pharmacokinetics: حركية الدواء الإكلينيكية المتقدمة	[2+0]	2	--	1	90	--	10
	1116	Clinical Pharmacy. صيدلة أكلينيكية.	[3+1]	3	3	1	150	30	20
	1128	Laws and Legislations. (Hospitals) القوانين والتشريعات(مستشفيات).	[1+0]	1	--	--	50	--	--
	1418	Infection control system. نظام مراقبة العدوى.	[1+1]	1	3	--	50	50	--
	1419	Sterilization and Microbial Quality Control. التعقيم ورقابة الجودة ميكروبيولوجياً.	[1+0]	1	--	--	50	--	--
Total credit hours required			30						

*** Oral Setting**

Course Content of Diploma of Hospital Pharmacy

Code No. & Credit Hours	Course Title and Content
1108 **(2+1)**	**Sterile Dosage Forms and Radiopharmaceuticals:** **المستحضرات العقيمة والمواد الصيدلية المشعة** Parenterals, large volume parenterals, parenteral solutions, suspensions and emulsions. Sterilization techniques and quality control. Sterile product manufactured in the hospital and total parenteral nutrition. **Practical Course:-** Includes practical application for theoretical course.
1109 **(2+1)**	**Hospital Pharmacy Administration:** **إدارة صيدلة المستشفيات** Administrative structure of the hospital pharmacy, personnel .Policy and procedure manual. Pharmacy and therapeutic committee. Moral committee Hospital formulary and Facilities required. **Practical Course:-** Includes practical application for theoretical course.
1110 **(2+1)**	**Hospital Pharmacy Practice:** **ممارسة صيدلة المستشفيات** In–Patient pharmacy services, Out–Patient services, pharmaceutical procurement and control services, Drug information services, pharmaceutical development services, Rational use of drugs and essential drug list, Educational and training services, Handling of cytotoxic drugs and radiopharmaceuticals and Drug – drug interaction services. **Practical Course:-** Includes practical application for theoretical course.
1111 **(1+0)**	**Drug Interactions:** **تفاعلات الأدوية** Physiological and physicochemical factors affecting drug absorption from GIT, influence of food and diet “drug-food interactions”. Drug-drug interactions.
1710 **(1+0)**	**Clinical Laboratory Analysis:** **تحاليل طبية** Blood tests and urine tests. Biochemical tests. Advanced biochemistry. Histological tests and tests for blood diseases.
2002 **(2+0)**	**Pharmaceutical Statistics:** **الإحصاء الصيدلى** Normal and binomial distribution. Probability, use of factorials, combinations and permutations. Measuring of central tendency and various distribution modes for pharmaceutical data. Significance. Testing, sampling procedures and outliers. T-test, ANOVA, line statistics, correlation and regression experimental design and factorial design.
1112 **(0+2)**	**Research Project:** **مشروع بحثى** Choosing research subject of potential item in specialty.
1113 **(3+1)**	**New Drug Delivery Systems:** **أنظمة جديدة لتوصيل العقار** Oral delivery systems, parenterals, topical preparations, rectal preparations, vaginal preparations, ocular, otic and nasal preparations. New drug delivery system. **Practical Course:-**Includes practical application for theoretical course.
1114 **(1+0)**	**Drug Information:** **معلومات الأدوية** Drug information services. Rational use of drugs. Educational activities: postgraduate education and research and patient education.
1115	**Advanced Clinical Pharmacokinetics:** **حركية الدواء الإكلينيكية المتقدمة**

(2+0)	Basic pharmacokinetics, Clinical pharmacokinetics in kidney and liver diseases. Pharmacokinetics of narrow therapeutic index drugs. Nomograms of drugs as vancomycin, Digoxin, theophylline, procainamide, quinidine, phenytoin carbamazepine, valproic acid, lithium, etc…..
1116 **(3+1)**	**Clinical Pharmacy:** **صيدلة اكلينيكية** Physiology and diseases. Therapeutic treatment of diseases of cardiovascular system, endocrine system, nervous system, urinary system. Treatment of pediatrics and geriatrics. Problems of treatment by drugs. Treatment of chronic diseases. **Practical Course:-**Includes practical application for theoretical course.
1128 **(1+0)**	**Laws and Legislations (Hospitals):** **القوانين والتشريعات (مستشفيات)** - Study of the law no. 127 issued in 1955 for pharmacy profession and its modification [Community and private pharmacy, Drug companies, Drug stores, Medicinal herbs, etc.., and also with registration and distribution]. - Narcotic; law [National regulations, Narcotic drugs, Handling and violation].
1418 **(1+1)**	**Infection control system:** **نظام مراقبة العدوى** Methods of infections in hospitals, prophylaxis and use of antibiotics. Preparation of immunological preparations and its quality control. **Practical Course:-**Includes practical application for theoretical course.
1419 **(1+0)**	**Sterilization and Microbial Quality Control:** **التعقيم ورقابة الجودة ميكروبيولوجياً** Sterilization of pharmaceutical preparation, surgical tools, instruments and dressing. Sterility assurance levels required for pharmaceuticals. Validation of the sterilization process and quality control.

Diploma of Industrial Pharmacy

The candidate studies (14) compulsory courses and presents (1) research project as shown in the following table:

Semester	Code No.	Course Title	Credit Hours	Exam. Hours			Exam. Marks		
				Written	Practical	Oral*	Written	Practical	Oral
First	1117	Pharmaceutical Process Engineering هندسة العمليات الصيدلية	[2+0]	2	--	1	90	--	10
	1118	Physical Pharmacy. صيدلة فيزيائية.	[2+1]	2	3	--	100	50	--
	1119	Solid Dosage Forms. الأشكال الصيدلية الصلبة.	[2+1]	2	3	1	100	35	15
	2002	Pharmaceutical Statistics. الإحصاء الصيدلي.	[2+0]	2	--	--	100	--	--
	2105	Advanced Drug Delivery Systems. أنظمة توصيل أدوية متقدمة.	[2+0]	2	--	--	100	--	--
	2109	Good Manufacturing practice, Quality control, Quality Assurance and Validation, الاداء التصنيعى الجيد، مراقبة وتاكيد الجودة والمصداقية فى الصناعة الصيدلية	[2+0]	2	--	--	100	--	--
Second	1120	Factory architecture & planning التصميم الهندسى والتخطيط للمصنع	[1+0]	1	--	--	50	--	--
	1121	Research Project. مشروع بحثي.	[0+2]	--	--	--	--	--	100
	1124	Liquid & Disperse Dosage Forms. الأشكال الصيدلية السائلة والمعلقة	[2+1]	2	3	1	100	35	15
	1125	Parenterals and Sterile Area. الحقن والمنطقة العقيمة.	[2+0]	2	--	1	90	--	10
	1127	*Registration of Dosage Forms* تسجيل المستحضرات الصيدلية	[1+0]	1	--	--	50	--	--
	1420	Microbial Quality Assurance. تاكيد الجودة ميكروبيولوجيا.	[2+0]	2	--	--	100	--	--
	2102	Drug Stability in dosage forms ثبات الأدوية فى المستحضرات الصيدلية.	[2+0]	2	--	--	100	--	--
	2110	Scale up techniques in pharmaceutical Industries تقنيات التصعيد فى الصناعات الصيدلية	[2+0]	2	--	--	100	--	--
	2111	Mechanical Utilities & Services الخدمات والامكانيات الميكانيكية	[2+0	2	-	-	100	-	-
Total credit hours required			31						

*** Oral Setting**

Course Content of Diploma of Industrial Pharmacy

Code No. & Credit Hours	Course Title and Content
1117 **(2+0)**	**Pharmaceutical Process Engineering:** هندسة العمليات الصيدلية Heat transfer, evaporation, drying, distillation, extraction, crystallization, filtration, mixing, emulsification, size reduction and enlargement, refrigeration, mass transfer and fermentation.
2002 **(2+0)**	**Pharmaceutical Statistics:** الإحصاء الصيدلى Normal and binomial distribution. Probability, use of factorials, combinations and permutations. Measuring of central tendency and various distribution modes for pharmaceutical data. Significance. Testing, sampling procedures and outliers. T-test, ANOVA, line statistics, correlation and regression.
2109 **(2+0)**	**Good Manufacturing practice, Quality control, Quality Assurance and Validation:** الاداء التصنيعى الجيد، مراقبة وتاكيد الجودة والمصداقية فى الصناعة الصيدلية Quality, quality control, quality management, process control, material control, GMP, Personnel, buildings, equipment, production procedures, packaging and validation. Basic requirements for pharmaceutical quality management. Total quality management. Quality costs. Manufacturing quality management. Process flow charts, process flow analysis, process specification, process validation. Regulatory aspects, design and performance qualification. Documentation.
1118 **(2+1)**	**Physical Pharmacy:** صيدلة فيزيائية Thermodynamics, preformulations, physicochemical principles of solutions, disperse systems and solids. **Practical Course:-**Includes practical application for theoretical course.
1119 **(2+1)**	**Solid Dosage Forms:** الأشكال الصيدلية الصلبة Raw materials, Preparation advanced techniques, formulation, types of coating and coating techniques, R &D patches validation of solid dosage forms. **Practical Course:-**Includes practical application for theoretical course.
1120 **(1+0)**	**Factory architecture& planning:** التصميم الهندسى والتخطيط للمصنع Facility design – Manufacturing building components – organization - design details – material finishing –planning process-business case-capital investment decisions-purchasing and supply- case study.
1121 **(0+2)**	**Research Project:** مشروع بحثى Choosing research subject of potential item in specialty.
2105 **(2+0)**	**Advanced Drug Delivery Systems:** أنظمة توصيل أدوية متقدمة Drug targeting, released erythrocytes, monoclonal antibodies, transdermal, nasal, ocular, gastroretentive devices, nanotechnology, liposomes and brain targeting
2102 **(2+0)**	**Drug Stability in dosage forms:** ثبات الأدوية فى المستحضرات الصيدلية Reaction kinetics and drug stability which includes: reaction orders, complex reaction orders: Parallel and consecutive reactions, Dosage forms instability. Routes of degradation Accelerated, stability program

1124 **(2+1)**	**Liquid & disperse Dosage Forms:** **الأشكال الصيدلية السائلة والمعلقة** Solutions, Colloids, Suspensions, Emulsions: formulation, rheology additives, stability, production. Approaches to improve aqueous solubility, formulation additives. **Practical Course: -**Includes practical application for theoretical course.
1125 **(2+0)**	**Parenterals and Sterile Area:** **الحقن والمنطقة العقيمة** Routes of parenteral administration, formulation and preparation of parenteral solutions, suspensions and emulsions. Sterilization process, sterile area design and facilities, validation of sterile area and sterilization process, quality control testing.
2111 **(2+0)**	**Mechanical Utilities & Services:** **الخدمات والامكانيات الميكانيكية** Design of facility utility -mechanical systems-heating-ventilation-air conditioning systems-Fire protection systems- piping systems- Purified water station-vacuum-Process gases.
2110 **(2+0)**	**Scale up techniques in pharmaceutical industries:** **تقنيات التصعيد فى الصناعات الصيدلية** Problems evolved during transfer the formula from laboratory scale to industrial scale – How to solve different problems of scaling up- case study. **Practical Course: -**Includes practical application for theoretical course.
1420 **(2+0)**	**Microbial Quality Assurance:** **تأكيد الجودة ميكروبيولوجياً** Microbiological quality of pharmaceuticals and surgicals, the microbial of non-sterile products, Pharmaceutical and surgical sterilization: the sterilization process and the validation of the sterilization process.

Diploma of Medicinal Plants

The candidate studies (9) compulsory courses and presents (1) research project as shown in the following table:

Exam. Marks			Exam. Hours			Credit Hours	Course Tile	Code No.	Semester
Oral*	Practical	Written	Oral*	Practical	Written				
--	--	50	--	--	1	[1+0]	Introduction to Herbal Medicine and Worldwide Distribution. مقدمة فى طب الأعشاب وتوزيعها الجغرافى فى العالم.	1201	First
--	--	50	--	--	1	[1+0]	Traditional and Medicinal Applications of Herbs in The Civilized Countries. التطبيقات التقليدية والطبية للأعشاب فى البلاد المتحضرة.	1202	
--	100	100	--	4	3	[2+2]	Modern Methods Adopted for Cultivation and Propagation of Medicinal Plants and Their Adverse Effects. الطرق الحديثة المستخدمة فى زراعة وإكثار النباتات الطبية وأثارها الجانبية.	1203	
--	--	100	--	--	2	[2+0]	Flora of Egypt: Proper Collection, Drying and Storage of Cultivated and Wild Medicinal Plants Prior Human Consumption. نباتات مصر: الجمع والتجفيف والتخزين المناسب للنباتات الطبيةالمستزرعة و البرية قبل الإستهلاك الآدمي.	1204	
--	50	150	--	3	3	[3+1]	**Chemistry and Bioactivity of Selected Phytoconstituents. الكيمياء والفاعليات الحيوية لبعض المكونات النباتية المختارة.	1206**	
--	50	100	--	3	2	[2+1]	**Aromatherapy and Chemistry of Volatile Oils. التأثيرالعلاجى والتركيب الكيميائى للزيوت الطيارة.	1207**	
--	100	100	--	5	3	[2+2]	Traditional Medicine in Egypt Quality Assurance of Herbal Drugs Guided By WHO Measures. الطب التقليدى فى مصر: تأكيد جودة الأعشاب الطبية وفقاً لمعايير منظمة الصحة العالمية.	1205	Second
--	50	100	--	3	2	[2+1]	Chromatographic Techniques Applied for Identification and Quantification of Phytoconstituents. التقنيات الكروماتوجرافية المستخدمة للتعرف والتقويم الكمي للمكونات النباتية.	1208	
--	--	200	--	--	3	[4+0]	Medicinal Plants Industrialization in Egypt. تصنيع النباتات الطبية فى مصر.	1209	
200	--	--	--	8	--	[0+4]	Research Project. مشروع بحثى.	1210	
						30			

*** Oral Setting**

**** تم استبدال الجدول بالجدول الصادر بالقرار الوزارى رقم (١٠٠) بتاريخ ٢٠١٣/١/١٤**

Course Content of Diploma of Medicinal Plants

Code No. & Credit Hours	Course Title and Content
1201 (1+0)	**Introduction to Herbal Medicine and Worldwide Distribution:** مقدمة فى طب الأعشاب وتوزيعها الجغرافى فى العالم The course aims at introducing the student to the use of herbals for alleviating diseases in different ancient cultures worldwide.
1202 (1+0)	**Traditional and Medicinal Applications of Herbs in The Civilized Countries:** التطبيقات التقليدية والطبية للأعشاب فى البلاد المتحضرة The course deals with the current application of phytomedicines in different developed countries from traditionally used herbals.
1203 (2+2)	**Modern Methods Adopted for Cultivation and Propagation of Medicinal Plants and Their Adverse Effects:** الطرق الحديثة المستخدمة فى زراعة وإكثار النباتات الطبية و أثارها الجانبية The course deals with the different methods for cultivation of medicinal plants as well as conservation of wildly growing endangered plants.
1204 (2+0)	**Flora of Egypt: Proper Collection, Drying and Storage of Cultivated and Wild Medicinal Plants Prior Human Consumption:** نباتات مصر: الجمع والتجفيف والتخزين المناسب للنباتات الطبية المستزرعة والبرية قبل الإستهلاك الأدمى The course deals with the methods and factors affecting proper collection, drying, storage of medicinal and aromatic plants prior human consumption.
1205 (2+2)	**Traditional Medicine in Egypt: Quality Assurance of Herbal Drugs Guided By WHO Measures:** الطب التقليدى فى مصر: تأكيد جودة الأعشاب الطبية وفقاً لمعايير منظمة الصحة العالمية. The guidelines of quality assurance of herbal drugs are studied with the aim of applying Good Agricultural Practice (GAP) and Good Manufacturing Practice (GMP). **Practical Course:-**Includes practical application of theoretical course.
1206 (3+1)	**Chemistry and Bioactivity of Selected Phytoconstituents:** الكيمياء والفاعليات الحيوية لبعض المكونات النباتية المختارة In this course selected classes of phytoconstituents are studied comprising phenolics, alkaloids, terpenoids, etc. Evidence-based bioactivities are also discussed.
1207 (2+1)	**Aromatherapy and Chemistry of Volatile Oils:** التأثيرالعلاجى والتركيب الكيميائى للزيوت الطيارة The course deals with the chemistry of different compounds constituting volatile oils and their potentialities in alleviating illnesses, i.e. aromatherapy.
1208 (2+1)	**Chromatographic Techniques Applied for Identification and Quantification of Phytoconstituents:** التقنيات الكروماتوجرافية المستخدمة للتعرف والتقويم الكمى للمكونات النباتية Different chromatographic techniques applied for the qualitative and quantitative analysis of phytoconstituents are studied. Examples of standardized extracts and phytopharmaceuticals are presented. **Practical Course:-**Includes practical application of theoretical course.

1209 **(4+0)**	**Medicinal Plants Industrialization in Egypt:** **تصنيع النباتات الطبية فى مصر** The course focuses on the potentialities of industrialization of medicinal and aromatic plants in Egypt with emphasis on the production of standardized herbals and phytopharmaceuticals
1210 **(0+4)**	**Research Project:** **مشروع بحثى** Choosing research subject of potential significance.

Diploma of Toxicology and Forensic Chemical Analysis

The candidate studies (11) compulsory courses and presents (1) research project as shown in the following table:

Exam. Marks			Exam. Hours		Credit Hours	Course Title	Code No.	Semester
Oral	Practical	Written	Practical	Written				
-	--	100	--	2	[2+0]	Pharmaceutical Statistics. احصاء صيدلي.	2002	First
25	25	50	3	1	[1+1]	Qualitative and Quantitative Analysis of Organic Poisons. التحليل الكمي والكيفي للسموم العضويـــة.	1607	
25	25	100	3	2	[2+1]	Natural Sources of Human Poisoning and Their Respective Symptoms and Chemical Analysis. المصادر الطبيعية للتسمم الادمي، أعراضها وتحليلها كيميائياً.	1212	
	--	50	--	1	[1+0]	Laws and Legislations (Hospitals). القوانين والتشريعات (مستشفيات).	1128	
--	--	100	--	2	[2+0]	* Poison Information Centers مراكز معلومات السموم	*1306	
	200	--	--	--	[0+4]	* Research Project. مشروع بحثي.	*1307	
25	25	50	3	1	[1+1]	Identification and Analysis of Inorganic Poisons. التعرف علي السموم غير العضوية وتحليلهـا.	1301	Second
25	25	150	3	3	[3+1]	Symptoms and Kinetics of Poisons. حركية السموم وأعراض التسمم.	1302	
25	25	150	3	3	[3+1]	Forgery. التزييف والتزوير.	1303	
25	25	150	3	3	[3+1]	Inspection of Accident Sites and Their Remains. معاينة أماكن الحوادث ومخلفاتها.	1304	
--	--	100	--	2	[2+0]	Impact of Fire, Weapons and Explosives. أثار الحريق والأسلحة والمفرقعات.	1305	
					30	Total credit hours required		

*** تم استبدال الجدول بالجدول الصادر بالقرار الوزارى رقم (١٠٠) بتاريخ ٢٠١٣/١/١٤**

Course Content of Diploma of Toxicology and Forensic Chemical Analysis

Code No. & Credit Hours	Course Title and Content
2002 **(2+0)**	**Pharmaceutical Statistics:** **الإحصاء الصيدلى** Normal and binomial distribution. Probability, use of factorials, combinations and permutations. Measuring of central tendency and various distribution modes for pharmaceutical data. Significance. Testing, sampling procedures and outliers. T-test, ANOVA, line statistics, correlation and regression.
1607 **(1+1)**	**Qualitative and Quantitative Analysis of Organic Poisons:** **التحليل الكمى والكيفى للسموم العضوية** An Introduction on classification of organic synthetic poisons [pesticides] is according to its uses e.g. herbicides, rodenticides……etc. or classification according to chemical groups present in its chemical structure. Then study of general methods used for its analysis. Then simple study of some pesticides as examples. **Practical Course: -**Includes practical application for theoretical course.
1212 **(2+1)**	**Natural Sources of Human Poisoning and Their Respective Symptoms and Chemical Analysis:** **المصادر الطبيعية للتسمم الآدمى ، أعراضها وتحليلها كيميانياً** Human poisoning by natural sources is studied with the aim of identifying the respective symptoms. Chemical methods of qualitative and quantitative analysis are studied in details. **Practical Course:-** Includes practical application for theoretical course.
1128 **(1+0)**	**Laws and Legislations(Hospitals):** **(مستشفيات) القوانين والتشريعات** - Study of the law no. 127 issued in 1955 for pharmacy profession and its modification [Community and private pharmacy, Drug companies, Drug stores, Medicinal herbs, etc. and also with registration and distribution]. - Narcotic law [National regulations, Narcotic drugs, Handling and violation].
1301 **(1+1)**	**Identification and Analysis of Inorganic Poisons:** **التعرف على السموم غير العضوية وتحليلها** 1- Cases of poisons with most common inorganic drugs. 2- Schedule of analysis of inorganic poisons in body tissues and fluids. 3- Spot tests of local toxicities of inorganic poisons on isolated animal organs and tissues. 4- Spot tests of In–Vitro toxic effects on blood. 5- Reporting of inorganic poison analysis In–Vitro and In–Vivo. 6- Alternatives of In–Vivo methods of toxic analysis. **Practical Course:-** - In – Vitro: Spots: Corrosives - Irritants. - In – Vivo cases of poisoning. - Hemolytic agents.

1302 **(3+1)**	**Symptoms and Kinetics of Poisons:** **حركية السموم وأعراض التسمم** 1- Scope of toxicology. 2- Clinical and experimental studies. 3- Ethics of clinical studies. 4- Post marketing surveillance. 5- Genetic drugs. **Effects of Poisons:** 1- Poison information centers. 2- Expired drug toxicity studies. 3- Regulation of toxicity tests – Drugs – Biologics – Food – Cosmetics –Toys – Medical. 4- Pyrogen test. 5- Viral and bacterial sterilization. 6- Essential organs. 7- Silent and indirect toxic agents. 8- Excipient toxicity. **Practical Course:-** - Agents excreted in milk and causing toxicity of babies. - Congenital malformation. - Hemolytic agents and chemicals affecting hemoglobin. - Poisons and antidotes.
1303 **(3+1)**	**Forgery:** **التزييف والتزوير** 1- The scientific and technical basis to match the manual inscription. 2- The different ways of corporeal falsification and how to reveal them. 3- Falsification of governmental documents and how to reveal them. 4- Currency falsification and how to reveal it. 5- Signatures and how falsify and reveal them. 6- The study of scientific and laboratory instruments which are used to reveal falsification. **Practical Course:-** Includes practical application for theoretical course.

1304 **(3+1)**	**Inspection of Accident Sites and Their Remains:** **معاينة اماكن الحوادث ومخلفاتها** 1- Small arms; rifling type and effects; its calibers. 2- Direction, distance and deviations of projectiles during firing. 3- Investigation ways to obtain debris of weapons, projectiles in accident. 4- The resultant debris of broken glasses in a accidents. 5- Microscopic inspection of bullets [projectiles] and cases; cartridges obtained from scene. 6- Tools inspections in accidents. 7- Biological debris obtained in accidents and manor to handle it up to transport to the criminal laboratory. 8- Report; how to prepare and discuss.
1305 **(2+0)**	**Impact of Fire, Weapons and Explosives:** **آثار الحرائق والأسلحة والمفرقعات** 1- Fire department inspection. 2- Fire inspector role – explosive expert. 3- Determination of beginning of fire region [area]. 4- Inspection of debris of fire region beginning 5- Fire reasons. 6- Arsons – sampling of analysis of sampling. 7- Polymers hazards results of its fire. 8- Legality of fire reports. 9- Explosions: Types, surveying of accidents that it is used – how to table samples, analysis – recognitions of its types, amounts.
1306 **(2+0)**	**Poison Information Centers:** **مراكز معلومات السموم** This course deals with importance of poison control centers in identifying cases of drug and chemical poisoning in connection with symptoms, estimation of poisons in toxicated patients and treatment of poisoning. In addition, the course is concerned with the significance of public education about protective measures of poisoning and importance of immediate notification of poisoning to one of the poison control centers in Egypt. The course also deals with sources of poisoning, symptoms and diagnosis for the most important drugs and poisons in Egypt. .
1307 **(0+4)**	**Research Project:** **مشروع بحثى** Choosing research subject of potential item in specialty.

*Diploma of Pharmacology

The candidate studies (9) compulsory courses and presents (1) research project as shown in the following table:

Exam. Marks			Exam. Hours		Credit Hours	Course Title	Code No.	Semester
Oral	practical	Written	practical	written				
50	50	200	4	3	[4+2]	Advanced Applied Pharmacology. علم الأدوية التطبيقى المتقدم.	1308	First
25	25	50	3	1	[1+1]	Immuno Pharmacology. علم الأدوية المناعى.	1309	
50	50	100	4	2	[2+2]	Screening of Drugs and Biostatistics. أستكشاف أدوية وإحصاء حيوى.	1310	
--	--	50	--	1	[1+0]	Medical Terminology. المصطلحات الطبية.	1311	
--	--	100	--	2	[2+0]	Pathophysiology. التغييرات الوظيفية فى الأمراض.	1312	Second
25	25	150	3	3	[3+1]	Clinical Pharmacology. علم الأدوية الإكلينيكى.	1313	
50	50	100	4	2	[2+2]	Applied Toxicology. السموم التطبيقى.	1314	
--	--	100	--	2	[2+0]	Relationship Between the Chemical Structure of a Drug and its biological Activity. العلاقة بين التركيب الكيميائى وفعالية الدواء.	1315	
--	--	50	--	1	[1+0]	Drug – Drug Interaction. تداخلات الأدوية.	1316	
--	100	--	--	--	[0+2]	Research Project. مشروع بحثى.	1317	
					28	Total credit hours required		

*** قرار وزاري رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

*Course Content of
Diploma of Pharmacology

Code No. & Credit Hours	Course Title and Content
1308 **(4+2)**	**Advanced Applied Pharmacology:** **علم الأدوية التطبيقى المتقدم** 1- Receptors, mechanisms of drug action neurotransmitters and their role in health of disease. 2- Gene expression in the mammalian nervous system. 3- Current trends in treatment of Alzheimer. 4- Current trends in treatment of cancer. 5- Obesity and eating disorders. 6- Bone metabolism and bone disorders. **Practical Course: -**Isolated: [rectus - intestines]. - Cases and their discussion. - Drug profile presentation.
1309 **(1+1)**	**Immuno Pharmacology:** **علم الأدوية المناعى** The Immune System: Cell – Mediated immune response Antibody – Mediated immune response, the complement system, immunoglobulins hypersensitivity reactions, inflammation, immunopharmacology of asthma, effect of drugs on the immune response, autoimmune diseases, principles of immunosupperssion, lymphokines and interferons, immunological adjuvants, monoclonal antibodies, immune pharmacology of schistosomiasis. Glucocorticoids, corticosteroids of nonsteroidal antiinflammatory agents, antirheumatic agents. **Practical Course:-**Includes practical application for theoretical course.
1310 **(2+2)**	**Screening of Drugs and Biostatistics:** **أستكشاف أدوية وإحصاء حيوى** 1- Screening of antidiabetic activity. 2- Screening of antiulcer drugs. 3- Screening of sedatives of hypnotics. 4- Screening of Kidney protecting drugs. 5- Screening of anticancer drugs. **Practical Course:-** - Bioassay of oxytocin - Rabbit blood sugar method for insulin. - Bioassay of screening of antiulcer drugs. - Screening for antihypertensive drugs. - Screening for anti-inflammatory drugs.

*** قرار وزاري رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

1311 **(1+0)**	**Medical Terminology:** المصطلحات الطبية 1- Introduction about the significance and scope of application of medical terminology. 2- Elements of combined words. 3- Commonly applicable prefixes suffixes and roots. 4- Terminology of various body systems and organs including anatomical, physiological, pathological, pharmacological, and toxicological aspects.
1312 **(2+0)**	**Pathophysiology:** التغييرات الوظيفية فى الأمراض - Etiology and pathophysiology of insomnia, anxiety, psychosomatic diseases, depression, parkinsonism, all types of epilepsy, pain, rheumatic disease, rheumatic arthritis, gout, hypertension, angina pectoris, cardiac arrhythmias, atherosclerosis congestive heart failure, bronchial asthma, endocrine imbalance.
1313 **(3+1)**	**Clinical Pharmacology:** علم الأدوية الإكلينيكى Basic and clinical pharmacology of drugs used in various clinical conditions such as insomnia, anxiety, psychosomatic diseases depression schizophrenia and psychosis parkinson disease epilepsy rheumatic diseases, rheumatoid asthmatic and gout, hypertension heart failure and angina. **Practical Course: -**Includes practical application for theoretical course.
1314 **(2+2)**	**Applied Toxicology:** السموم التطبيقى 1- Source and hazards of free radicals. 2- Causes of adverse reactions. **Practical Course: -**Includes practical application for theoretical course.
1315 **(2+0)**	**Relationship Between the Chemical Structure of a Drug and its Biological Activity:** العلاقة بين التركيب الكيميائى وفعالية الدواء 1- Introduction. 2- Effect of change in structure on solubility, distribution, absorption, fat storage of receptors binding. 3- SAR in some pharmacological groups.
1316 **(1+0)**	**Drug – Drug Interaction:** تداخلات الأدوية 1- Adverse drug reactions. - Classification of drug interactions. - Mechanisms of drug interaction. - Examples and drug interactions.
1317 **(0+2)**	**Research Project:** مشروع بحثى Choosing research subject of potential item in specialty.

Diploma of Pharmacovigilance

The candidate studies nine (9) compulsory courses and ONE research project as shown in the following table:

Semester	Code	Title	Credit Hrs	Exam Hrs		Exam Marks		
				Written	Practical	Written	Practical	Oral
First	1318	Pharmacovigilance-I	4+1	3	2	200	25	25
	1319	Pharmacotherapy-I	2+1	2	2	100	25	25
	1320	System-Based Adverse Drug Reactions-I	2+1	2	2	100	25	25
	1321	Medical Biostatistics	2+0	2	--	100	--	--
	1322	Pharmaco-epidemiology	2+0	2	--	100	--	--
Second	1323	Pharmacovigilance-II	4+1	3	2	200	25	25
	1324	Pharmacotherapy-II	2+1	2	2	100	25	25
	1325	System-Based Adverse Drug Reactions-II	2+1	2	2	100	25	25
	1326	Special Populations Pharmacotherapy & Drug Safety	2+0	2	--	100	--	--
	1327	Research Project	0+2	--	5	--	-	100

Course Content of Diploma of Pharmacovigilance

WHO Definition of PVG: '*The science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problems*".

Semester One Courses (Total 15 Credit Hours)

1- Pharmacovigilance-I (٤+1)

This course is designed to deliver basic knowledge to the students on Pharmacovigilance and risk benefit balance of marketed products based on their knowledge of the pharmacological background of the drugs. Also students are trained to suggest strategies for the best therapeutic outcomes with minimum risks. It will cover the following topics: PV development, basics in PV science and monitoring safety in clinical trials as well as from preclinical testing data. Phases of clinical trials will be addressed with emphasis on safety monitoring. Spontaneous reporting systems will be discussed including specified system from EU, USA, and Canada

2- Pharmacotherapy-I (٢+1)

The course deals with application of the most appropriate therapeutic treatments of different diseases in a system-based approach as per international guidelines. For each disorder, the following issues are to be addressed:

a) Disease definition and classes or types including clinical, laboratorical and pathophysiological changes and treatment objectives.
b) Patient/drug selection, when drug must be avoided.
c) Monitoring of the efficacy/safety therapy outcome.

The following systems will be covered:

1) Cardiovascular Disorders including: Essential Hypertension, Peripheral Vascular Disease, Chronic Stable Angina, Acute Coronary Syndromes, Heart Failure and Cardiac Arrhythmias.
2) Respiratory System Disorders including asthma, chronic obstructive pulmonary disease, acute/chronic rhinitis.
3) Endocrine Disorders including treatment of:
   a] thyroid disorders b] diabetes mellitus

The practical course is patient-based, adopting case-based approach in teaching.

3- System-Based Adverse Drug Reactions-I (2+1)

The course aims help attendees to develop appropriate knowledge and skills in drug-induced diseases in a system-based manner. The following topics will be addressed per each system:

a] causative agents b] Epidemiology
c] Mechanisms d] Clinical presentation
e] Morbidity & mortality f] Prevention & management

The following system ADRs will be covered:

1) Cardiovascular ADRs including hypertension/hypotension, heart failure, arrhythmias, and myocardial ischemia.
2) Bone, Joint and Muscle ADRs including osteoporosis, gout/hyperurecemia, and myopathy.
3) Endocrine ADRs including glucose disorders, thyroid dys-regulation, weight gain, sexual dysfunction in males, and gynecologic disorders.
4) Pulmonary ADRs including pulmonary fibrosis, and asthma/bronchospasm.

4- Medical Biostatistics (2+0)

Course starts with simple descriptive statistics through inferential one with the goal of understanding the use of statistics in signal detection and pharmacovigilance data.
Furthermore, studying biostatistics is crucial to understand clinical as well as experimental trials on drug safety and efficacy.
Descriptive statistics would include data description (charts/numeric), measures of location and spread, standard deviation and normal distribution. Proper data collection through confounding and matching and different study designs will be addressed.
Inferential statistics will discuss concepts and calculation methods of probability, risk and odds. Concept of confidence interval will be discussed. Difference of two population means will be studies.

5- Pharmacoepidemiology (2+0)

The course deals with applications and principles of Pharmacoepidemiology including the international standards for the appropriate Literature Review, along with the advances in clinical research with the increasing use of Systematic Review and Meta-analysis. It also highlights the rational of Evidence Based Medicine (EBM) in real world practice, and explored different Study designs staring from the simple questionnaires and surveys up to the sophisticated randomized double blind clinical trials. It also explores case-control, cohort, longitudinal observations, nested cohorts & other study designs used in the field of Pharmacoepidemiology.

Semester Two Courses (Total 15 credit hours)

1- Pharmacovigilance-II (4+1)

This module will address monitoring of drug safety in clinical trials and drug development. Methods and regulations for periodic safety update reports will be discussed. Furthermore, risk benefit assessment in pharmacovigilance. Regulations and guidelines for pharmacovigilance in EU, USA, and Canada will be studied. Harmonization procedures as per ICH and equivalents will be also covered.

2- Pharmacotherapy-II (2+1)

The course deals with application of the most appropriate therapeutic treatments of different diseases in a system-based approach as per international guidelines. For each disorder, the following issues are to be addressed:

a) Disease definition and classes or types including clinical, laboratorical and pathophysiological changes and treatment objectives.
b) Patient/drug selection, when drug must be avoided.
c) Monitoring of the efficacy/safety therapy outcome.

The following systems will be discussed:

1- Neurologic Disorders including treatment of the following disorders:
a] Parkinson's Disease b] Headache treatment c] Seizure Disorder d] Cerebrovascular Disorders
2- Psychiatric Disorders including treatment of:
a] Anxiety disorder b] Schizophrenia c] Major Depressive Disorder d] Bipolar Disorders
e] Attention-deficit Hyperactivity Disorder
3- Gastrointestinal Disorders including treatment of:
a] Upper GIT Disorders(dyspepsia, peptic ulcer disease,and gastroesophageal reflux disease (GERD)) b] Lower GIT disorders (inflammatory bowel disease, and irritable bowel syndrome)
4- Arthritic Disorders including treatment of:
a] Osteoarthritis b] Rheumatoid Arthritis c] Gout & Hyperuricemia

3- System-Based Adverse Drug Reactions-II (2+1)

The course aims help attendees to develop appropriate knowledge and skills in drug-induced diseases in a system-based manner. The following topics will be addressed per each system: a] causative agents, b] epidemiology, c] mechanisms, d] clinical presentation, e] morbidity & mortality and f] prevention & management.

The following system ADRs will be covered:

1- Dermatological ADRs including allergies/cutaneous diseases, photosensitivity, and alopecia/hirsutism
2- Gastrointestinal ADRs including upper GIT bleeding, diarrhea/constipation, nausea/vomiting, pancreatitis, and hepatic & cholestatic diseases
3- Hematological ADRs including thromboembolic disorders, agranulocytosis and neutropenia, and anemia
4- Neurological ADRs including seizures, stroke, delirium, and sleep disorders
5- Psychiatric ADRs including depression, anxiety, psychosis, and cognitive disorders

4-Special Populations Pharmacotherapy & Drug Safety (2+0)

1- Pharmacotherapy/PVG in Pediatrics

Enhanced vulnerability of pediatrics to drugs is studied. Reasons which contribute to the probability a safety signal may not be identified in the pediatric population until postmarketing are discussed.

This part provides also data sources for post-marketing pediatric adverse drug events and safety signal evaluation in the pediatric population to ensure a favorable benefit/risk ratio for marketed drugs used in pediatrics.

2- Pharmacotherapy/PVG during Pregnancy & Lactation

This part includes variety of medication use among pregnant women in addition to pre-marketing and post-marketing data sources regarding reproductive and developmental safety of prenatal drug exposures. The large number of medications used by pregnant women, a teratogen surveillance system that can adequately address these safety issues could substantially reduce the uncertainty around the safety of medications used during pregnancy.

3- Pharmacotherapy/PVG for Geriatrics

Age-related pharmacokinetic and pharmacodynamic alterations are to be addressed. Disease prevalence and drug use in the elderly, interactions in relation to multiple drug prescribing are discussed. Impact of aforementioned age-related changes and polypharmacy on ADRs incidences in the elderly is discussed.

5- Research Project (0+2)

Diploma trainees must conduct their research projects in parallel to the theoretical part along the academic semester/year. This research project can be achieved within an academic, regulatory or private body or the work place of each trainee.

Assessment will be in three parts: a] research project supervisor evaluation, b] evaluation of the written report, and c] the oral defense of the research project report.

*Diploma of Microbiology

The candidate studies (12) courses and presents research project as shown in the following table:

Exam. Marks		Exam. Hours		Credit Hours	Course Title	Code No.	Semester
Practical	Written	Practical	Written				
--	100	--	2	[2+0]	Advanced Microbiology (I). ميكروبيولوجيا متقدمة (I).	2401	First
--	50	--	1	[1+0]	Immunology (I): Basic Immunology. مناعة (I): أساسيات المناعة.	2402	
--	100	--	2	[2+0]	Sterilization and Microbiological Quality Control and Quality Assurance. التعقيم والرقابة الميكروبيولوجية وتأكيد الجودة.	2403	
--	100	--	2	[2+0]	Antimicrobial Agents and Microbial Resistance. المضادات الميكروبية والمقاومة الميكروبية.	2404	
100	100	5	2	[2+2]	Diagnostic Bacteriology (I). بكتيريولوجيا تشخيصية (I).	1401	
100	100	5	2	[2+2]	**Diagnostic Virology and Mycology. علم الفيروسات والفطريات التشخيصي.	**1403	
--	100	--	2	[2+0]	Immunology (II): Immunologicals and Immunological Applications. مناعة (II): المستحضرات المناعية وطرق المناعة وتطبيقاتها.	2406	Second
100	100	5	2	[2+2]	Diagnostic Bacteriology (II). بكتيريولوجيا تشخيصية (II).	1402	
--	100	--	2	[2+0]	Biotechnology Applications. تطبيقات التكنولوجيا الحيوية.	1404	
100	50	5	1	[1+2]	Evaluation of Antimicrobial Agents. تقييم المضادات الميكروبية.	1405	
100	--	5	--	[0+2]	Advanced Microbiological Laboratory Techniques. التقنيات الميكروبية المعملية المتقدمة.	1406	
100	--	--	--	[0+2]	Research Project. مشروع بحثي.	1407	
				30	Total credit hours required		

*** قرار وزاري رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

**** تم استبدال الجدول بالجدول الصادر بالقرار الوزاري رقم (١٠٠) بتاريخ ٢٠١٣/١/١٤**

*Course Content of
Diploma of Microbiology

Code No.& Credit Hours	Course Title and Content
2401 **(2+0)**	**Advanced Microbiology (I):** **ميكروبيولوجيا متقدمة(I)** Biochemistry of the bacterial cell, Metabolism and biosynthetic pathways in microorganisms, Macromolecules and molecular genetics.
2402 **(1+0)**	**Immunology (I): Basic Immunology:** **مناعة (I): أساسيات المناعة** Components of the immune system, mechanisms of humoral and cellular immunity, cells and organs which participate in immunity building, immune system related diseases and disorders (hypersensitivity, auto immune diseases), mechanisms for tissues and organ rejection.
2403 **(2+0)**	**Sterilization and Microbiological Quality Control and Quality Assurance:** **التعقيم والرقابة الميكروبيولوجية وتاكيد الجودة** Aseptic techniques, different methods of sterilization of pharmaceutical preparations, validation of the sterilization process, methods for reducing the level of contamination of non-sterile pharmaceutical products, quality control procedures to assure high level of confidence and standardization of the procedures used in quality control.
2404 **(2+0)**	**Antimicrobial Agents and Microbial Resistance:** **المضادات الميكروبية والمقاومة الميكروبية** Introduction to antimicrobial agents, antibiotics and chemotherapeutic agents, non - antibiotics antimicrobial agents, mode of action, bacterial resistance to antimicrobial agents, mechanisms of resistance to antimicrobial agents.
1401 **(2+2)**	**Diagnostic Bacteriology (I):** **(I) بكتيريولوجيا تشخيصية** Methods associated with the culture, isolation and identification of medically important bacteria in laboratory analysis. **Practical Course:-** Includes practical application for theoretical course.
2406 **(2+0)**	**Immunology (II): Immunologicals and Immunological Applications:** **مناعة (II):المستحضرات المناعية وطرق المناعة وتطبيقاتها** Molecular immunology, serology in the diagnosis of diseases, therapeutic uses of microbial toxins (vaccines, toxoids, monoclonal antibodies, etc), quality assurance of immunologicals.
1402 **(2+2)**	**Diagnostic Bacteriology (II):** **بكتيريولوجيا تشخيصية(II)** Biochemical profile-based microbial identification system, rapid methods for bacterial identification. **Practical Course:-** Includes practical application for theoretical course.
1403 **(2+2)**	**Diagnostic Virology and Mycology:** **علم الفيروسات والفطريات التشخيصى** Taxonomy of fungi, methods of isolation and identification of fungi, pathogenic fungi. Principles of virology, clinical aspects of virus infection, lab diagnosis of viral infections, emerging viruses. **Practical Course:-** Includes practical application for theoretical course. *** قرار وزاري رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**
1404 **(2+0)**	**Biotechnology Applications:** **تطبيقات التكنولوجيا الحيوية** Applications of biotechnology in health care, production of antibiotics, enzymes, amino acids, vitamins, single cell proteins, organic acids and therapeutic proteins produced by recombinant DNA technology.

1405 **(1+2)**	**Evaluation of Antimicrobial Agents:** **تقييم المضادات الميكروبية** Methods for assessment of antimicrobial activity, assay for antibacterial, antifungal, sporicidal, antiviral agents, evaluation of non-antibiotics antimicrobial agents: preservatives, disinfectants and antiseptics. **Practical Course:-** Includes practical application for theoretical course.
1406 **(0+2)**	**Advanced Microbiological Laboratory Techniques:** **التقنيات الميكروبية المعملية المتقدمة** **Practical Course: -** Includes recent advances in microbiological techniques and their applications [PCR techniques, electrophoresis, southern blotting, ELISA].
1407 **(0+2)**	**Research Project:** **مشروع بحثى.** Choosing research subject of potential item in specialty.

Diploma of Biotechnology

The candidate studies (11) courses and presents research project as shown in the following table:

Exam. Marks		Exam. Hours		Credit Hours	Course Title	Code No.	Semester
Practical	Written	Practical	Written				
100	100	5	2	[2+2]	Basic Microbiology. أساسيات الميكروبيولوجيا.	1408	First
--	100	--	2	[2+0]	Advanced Microbiology (I). ميكروبيلوجيا متقدمة (I).	2401	
50	100	3	2	[2+1]	Molecular Biology. بيولوجية جزيئية.	1409	
50	100	3	2	[2+1]	Fermentation Technology. تكنولوجيا التخمر.	1410	
100	200	5	3	[4+2]	Chemical and Biochemical Engineering. الهندسة الكيميائية والبيوكيميائية.	1411	
50	100	3	2	[2+1]	Genetic Engineering. الهندسة الوراثية.	1412	Second
--	100	--	2	[2+0]	Sterilization in Biotechnology. التعقيم في التكنولوجيا الحيوية.	1413	
50	50	3	1	[1+1]	Applications of Modern Biotechnology. تطبيقات التكنولوجيا الحيوية الحديثة.	1414	
50	50	3	1	[1+1]	Biotechnology of special Systems. التكنولوجيا الحيوية لبعض الأنظمة الخاصة.	1415	
--	50	--	1	[1+0]	Bioinformatics. تطبيقات المعلومات الإحيائية.	1416	
100	--	--	--	[0+2]	Research Project. مشروع بحثي.	1417	
				30	Total credit hours required		

Course Content of Diploma of Biotechnology

Code No. & Credit Hours	Course Title and Content
1408 (2+2)	**Basic microbiology:** أساسيات الميكروبيولوجيا Overview of the microbial world including a survey of the structure, function, and diversity of microorganisms. Introduction to the concepts of microbial physiology. **Practical Course: -** Includes practical application for theoretical course.
2401 (2+0)	**Advanced Microbiology (I):** ميكروبيولوجيا متقدمة(I) Biochemistry of the bacterial cell, Metabolism and biosynthetic pathways in microorganisms, Macromolecules and molecular genetics.
1409 (2+1)	**Molecular Biology:** بيولوجية جزيئية Structure, function and synthesis of DNA, RNA and proteins. Roles of macromolecules in the regulation of information in the cell. Isolation and manipulation of nucleic acids, construction of recombinant DNA and transformation of cells. **Practical Course:-** Includes practical application for theoretical course.
1410 (2+1)	**Fermentation Technology:** تكنولوجيا التخمر Different fermentation processes used in biotechnology; batch, fed batch and continuous culture. **Practical Course:-** Includes practical application for theoretical course.
1411 (4+2)	**Chemical and Biochemical Engineering:** الهندسة الكيميائية والبيوكيميائية Thermodynamics, reaction rates and kinetics, transport phenomenon, aeration and agitation, bioreactors unit operation in biotechnology, instrumentation and control, scale up and operation in pilot plants. **Practical Course:-** Includes practical application for theoretical course.
1412 (2+1)	**Genetic Engineering:** الهندسة الوراثية Recombinant DNA technology, gene cloning, Site directed mutagenesis. Relevance and use of these techniques in medicine and industry. **Practical Course:-** Includes practical application for theoretical course.
1413 (2+0)	**Sterilization in Biotechnology:** التعقيم فى التكنولوجيا الحيوية Aseptic technique, Sterilization process in media preparation, fermentation and products recovery. Air sterilization, continuous flow sterilization.
1414 (1+1)	**Applications of Modern Biotechnology:** تطبيقات التكنولوجيا الحيوية الحديثة Applications of modern biotechnology in agriculture, medicine and environment, safety in biotechnology. Ecological, health and socioeconomic impacts of biotechnology. **Practical Course:-** Includes practical application for theoretical course.
1415 (1+1)	**Biotechnology of Special Systems:** التكنولوجيا الحيوية لبعض الأنظمة الخاصة Immune system cells, transgenic biological materials, drug targeting products, complex diagnostic kits, production in animals. **Practical Course:-** Includes practical application for theoretical course.
1416 (1+0)	**Bioinformatics:** تطبيقات المعلومات الإحيائية The role of computer sciences in biotechnology, mathematical process modeling, on-line microprocessor versus off-line manual control, programmable control.
1417 (0+2)	**Research Project:** مشروع بحثى Choosing research subject of potential item in specialty.

Diploma of Genomics and Bioinformatics

Semester	Code No.	Course Title	Credit hours	Exam. Hours		Exam. Marks			
				written	practical	written	practical	oral	Total
Frist	1409	Molecular biology بيولوجيا جزيئية	2+1	2	2	100	50	___	150
	1421	Systems biology الأنظمة البيولوجية	2+1	2	2	100	50	___	150
	1422	Human genetic diseases and gene therapy الأمراض الوراثية والعلاج بالجينات	1+1	1	2	50	50	___	100
	1423	Bioinformatics – 1 المعلوماتية الاحيائية-١	1+1	1	2	50	50	___	100
	1424	Protein chemistry كيمياء البروتين	1+0	1	___	50	___	___	50
	1425	BioEhics أخلاقيات الدراسات الاحيائية	1+0	1	___	50	___	___	50
	1426	Advanced biostatistics أحصاء حيوى متقدم	1+1	1	2	50	50	___	100
	1427	Student Seminar-1 حلقة علمية	0+1	___	___	___	50	___	50
Second	1428	Pharmacogenomics علم الوراثة الدوائي	2+0	2	___	100	___	___	100
	1429	Antimicrobial and immunological drug discovery اكتشاف الأدوية المضادة للميكروبات والعلاج المناعي	2+1	2	2	100	50	___	150
	2407	Advanced molecular techniques طرق جزيئية متقدمة	1+0	1	___	50	___	___	50
	1430	Computer aided molecular modeling النمذجة الجزيئية بمساعدة الكمبيوتر	1+1	1	2	50	50	___	100
	1431	Bioinformatics 2 المعلوماتية الاحيائية -٢	1+1	1	2	50	50	___	100
	1432	Student seminar 2 حلقة علمية -٢	0+1	___	___	___	50	___	50
	1433	Project مشروع بحثى	2+0	___	___	___	100	___	100
Total credit hours required			28						

Course Content of Diploma of Genomics and Bioinformatics
محتوى مقررات دبلوم علم الجينوم والمعلوماتية الاحيائية

عـــــنـــــوان الـــمـــقـــرر ومحتواه	الرقم الكودى والساعات المعتمدة
Molecular biology **بيولوجيا جزيئية** Structure, function, and biosynthesis of nucleic acid and proteins. Function of molecules in cell regulation, isolation and manipulation of nucleic acids, replication of cells and transfer of genetic material. **الشكل والوظيفة والتصنيع لكل أنواع الأحماض النووية والبروتينات, وظيفة الجزيئات الكبيرة فى تنظيم المعلومات والخلية, الفصل والتعامل مع الأحماض النووية, تحويل الخلايا وتكنولوجيا نقل الموروثات.**	١٤٠٩ (١+٢)
Systems biology **الأنظمة البيولوجية** Studying biological systems as a holistic approach, one unit interacting with each other. Studying Omics of genomics, proteomics, transcriptomics, lipidomics and other approaches aiming to predict the responses of body or studies organism to external and internal factors including diseases and drugs. **دراسة الأنظمة البيولوجية كوحدة متكاملة متفاعلة مع بعضها البعض عن طريق دراسة ال omics من علم الجينوم, البروتيوم وال Transcriptome وال Lipidomics وغيرها فى طريقة متكاملة للوصول إلى طرق للتنبأ برد فعل الجسم أو الكائن الحيوى تحت الدراسة لأى عوامل خارجية أو داخلية بما فى ذلك الأدوية والأمراض**	١٤٢١ (١+٢)
Human genetic diseases and gene therapy **الأمراض الوراثية والعلاج بالجينات** Study human genetic diseases and understanding causes and factors modulating disease on genome level including changes in nucleic acids and proteins, use of genes in treatment of some diseases. **دراسة الأمراض الوراثية وفهم أسباب الأمراض على مستوى الجينيات ودخولاً فى متغيرات الأحماض النووية والبروتينات, واستخدام الجينات فى علاج بعض الأمراض.**	١٤٢٢ (١+١)
Bioinformatics – 1 **المعلوماتية الاحيائية** Importance of computer science in biotechnology, genomics and proteomics and other Omics approaches. Mathematical models and comparisons of manual, automated control in addition to computer-assisted manipulations. **أهمية علوم الكمبيوتر فى التكنولوجيا الحيوية وعلم الجينوم والبروتيوم وغيرها من ال omics, الأمثلة الرياضية, التحكم الإلكترونى فى المقابل مع التحكم اليدوى والتحكم المبرمج.**	١٤٢٣ (١+١)
Protein chemistry **كيمياء البروتين** Study of proteins chemical structure and three-dimensional arrangement of atoms in a protein molecule. Properties and interactions of proteins, study domains, motifs and folding of enzymes and structural proteins of the cell. Understand the functions of proteins at a molecular level. **دراسة التركيب البنائي والأشكال الفراغية والخواص والتفاعلات المميزة للبروتينات والتركيبات المتميزة للانزيمات والبروتينات المكونة للخلية.**	١٤٢٤ (٠+١)
BioEthics **أخلاقيات الدراسات الاحيائية** Study of the importance of ethics in biology as a whole and in scientific research, with case studies from internationally recognized entities that promote and assures scientific research is conducted according to bioethics and study the role of society in promoting ethics in science. **دراسة أهمية الاخلاقيات القويمة فى علم الاحياء ككل وفى البحث العلمى الدوائي خاصة مع دراسة نماذج من المواثيق المتعارف عليها دولياً للحث والتأكيد على ضمان مسايرة البحث العلمى للاخلاقيات المتفق عليها ودراسة اتجاه المجتمع العلمى نحو اخلاقيات بحث علمى متكاملة.**	١٤٢٥ (٠+١)

Advanced biostatistics **أحصاء حيوى متقدم** Statistical design including normal distribution, probabilities, mean and range and statistical differences in scientific and medical research. Experimental design, sampling of populations, correlation and regression analysis and multifactorial design. **التوزيع الطبيعى والاحتمالات وقياس المتوسط والأختلاف فى مجال الأبحاث العلمية والطبية, اختبارات الفروق الجوهرية, عمل تصميم للتجارب العملية وأخذ العينات الممثلة للمجموع تحت الدراسة, دراسة الارتباط والتصميم الإحصائي فى وجود عوامل متعددة Multifactorial.**	١٤٢٦ (١+١)
Student Seminar-1 **حلقة علمية** Scientific discussion of recent scientific publication to keep updated with recent advances in selected topics related to the studied topics. **حلقات دراسية علمية لمناقشة الأوراق العلمية وأحدث التطورات فى احد الموضوعات التى تمت دراستها.**	١٤٢٧ (٠+١)
Pharmacogenomics **علم الوراثة الدوائي** Study genetic basis for differential response to various treatments, including pharmacogenetics and pharmacogenomics with studying of specific gene polymorphisms on drug response and study of entire genome on drug response respectively. **يركز هذا المقرر على تباين استجابة الأفراد المختلفين جينياً للعلاج بالدواء, وينقسم إلى علم الوراثة الدوائي الذى يدرس تأثير تباين الجينات على مردود العلاج وعلم الجينوم الدوائي الذى يدرس الجينوم بأكمله.**	١٤٢٨ (٠+٢)
Antimicrobial and immunological drug discovery **اكتشاف الأدوية المضادة للميكروبات والعلاج المناعى** Approaches and steps used to discover new therapeutic targets whether as antimicrobials, vaccines or immune therapies using genomics and reverese vaccinology. **يختص هذا المقرر بالخطوات المتبعة لاكتشاف أهداف علاجية جديدة سواء كانت لاكتشاف مضادات للميكروبات أو مستحضرات مناعية, وقد يتم هذا عن طريق المسح الجينومى أو علم اللقاحات العكسي (Reverse vaccinology).**	١٤٢٩ (١+٢)
Advanced molecular techniques **طرق جزيئية متقدمة** Approaches and techniques for transfer of genetic material, DNA replication, polymerase chain reaction based techniques and bioinformatics applications. **تكنولوجيا نقل المورثات, الأستنساخ الجزيئي, تقنية تفاعل تسلسل البلمرة وتطبيقات المعلومات الاحيائية.**	٢٤٠٧ (٠+١)
Computer aided molecular modeling **النمذجة الجزيئية بمساعدة الكمبيوتر** Quantitative approach for evaluation of structure-activity relationship and development of molecular models aiming at designing drugs using computer-aided techniques and computational chemistry methods. Crystal structure of proteins and its relationship to drug discovery and NMR. **الاتجاه الكمى لتقييم العلاقة بين التركيب البنائي والفاعلية البيولوجية للنمذجة الجزئية وتصميم الدواء باستخدام الحاسب الآلى – التركيب البلورى للبروتينات وعلاقته باكتشاف الدواء- كيمياء التركيب التوافقى- الرنين النووى المغناطيسي.**	١٤٣٠ (١+١)
Bioinformatics 2 **المعلوماتية الاحيائية -٢** Advanced bioinformatics with focus on genome analysis and changes in the genome in addition to design of approaches for bioinformatics. **المستوى الثانى من مقرر المعلوماتية الاحيائية يركز على التحليل الجينومى وتغيير الجينوم إلى جانب تصميم مخططات منطقية للتحليل المعلوماتى.**	١٤٣١ (١+١)
Student seminar 2 **حلقة علمية -٢** Scientific discussions and roundtable discussions on recent advances in selected studied topics. **حلقات دراسية علمية لمناقشة أحدث التطورات فى أحد الموضوعات التى تمت دراستها.**	١٤٣٢ (٠+١)
Project **مشروع بحثى** Project in a topic of importance to the related specialization. **تشمل تقديم بحث أو مشروع لموضوع ذو أهمية فى مجال التخصص.**	١٤٣٣ (٠+٢)

*Diploma of Pharmaceutical Raw Materials Synthesis Technology

The candidate studies (14) courses and presents (2) research projects as shown in the following table:

Exam. Marks		Exam. Hours		Credit Hours	Course Title	Code No.	Semester
Practical	Written	Practical	Written				
--	100	--	2	[2+0]	Spectral Identification of Pharmaceutical Organic Compounds. التعرف الطيفى للمركبات العضوية الصيدلية .	**2503	First
--	100	--	2	[2+0]	Medicinal Chemistry. الكيمياء الطبية	2504	
--	50	--	1	[1+0]	Nomenclature of Pharmaceutical Organic Compounds. التسمية الكيميائية للمركبات العضوية الصيدلية.	**2506	
--	50	--	1	[1+0]	Recent Trends in Pharmaceutical Organic Chemistry. الإتجاهات الحديثة فى الكيمياء العضوية الصيدلية.	**2510	
50	150	3	3	[3+1]	Advanced Pharmaceutical Organic Synthesis. التشييد العضوى الصيدلى المتقدم	**1501	
50	100	3	2	[2+1]	Experimental in Organic Pharmaceutical Chemistry. التفاعلات العضوية الصيدلية العملية	**1502	
100	--	--	--	[0+2]	Research Project (I). مشروع بحثي (I).	1503	
--	50	--	1	[1+0]	Bioorganic Chemistry.الكيمياء العضوية الحيوية	2507	Second
--	50	--	1	[1+0]	Pericyclic Reactions Chemistry (applications in Pharmaceutical Industry). الكيمياء الحول الحلقية وتطبيقاتها فى الصناعات الدوائية.	**2508	
--	50	--	1	[1+0]	Advanced Heterocyclic Chemistry. الكيمياء الغير متجانسة المتقدمة.	2509	
--	50	--	1	[1+0]	Relating Structure to chemical Reactivity. علاقة التركيب البنائى بالنشاط الكيميائى.	2511	
50	--	--	--	[0+1]	Research Project (II). مشروع بحثي (II).	1504	
100	--	--	--	[2+0]	Stereo Chemistry الكيمياء الفراغية.	1505	
--	150	--	3	[3+0]	Nucleosides, Nucleotides and nucleic acids . نيكلوسيدات ونيكلوتيدات والأحماض الجينية	1506	
--	50	--	1	[1+0]	Synthesis of peptides and Peptidomimetics. تشييد الببتيبدات والببتيدات المشابهة.	1507	
--	100	--	2	[2+0]	Selected Topics in Pharmaceutical Organic Reaction. موضوعات مختارة من التفاعلات العضوية الصيدلية.	**1508	
				30	Total credit hours required		

*** قرار وزارى رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

**** تم استبدال الجدول بالجدول الصادر بالقرارالوزارى رقم (٢٠٠٤) بتاريخ ٢٠١٣/٨/١**

*Course Content of

Diploma of Pharmaceutical Raw Materials Synthesis Technology

Code No. & Credit Hours	Course Title and Content
**2503 (2+0)	**Spectral Identification of Pharmaceutical Organic Compounds:** التعرف الطيفى للمركبات العضوية الصيدلية A comprehensive course in the use of UV, Vis, IR, NMR, ESR and mass spectroscopy in the structural identification and characterization of organic compounds.
2504 (2+0)	**Medicinal Chemistry:** الكيمياء الطبية An introductory course in medicinal chemistry aimed to graduate students involved in making and / or studying compounds of possible biological significance. It includes the study of chemical and stereochemical aspects in drug-receptor interaction, computer- simulated models for drug-receptor complex, enzyme reactivity from an organic perspective, major metabolic pathways / activation leading to mutagenicity. Aspects concerning drug selectivity and discussion of selected recent articles in the field are also included.
**2506 (1+0)	**Nomenclature of Pharmaceutical Organic Compound:** التسمية الكيميائية للمركبات العضوية الصيدلية This course involves the application of the most updated IUPAC rules and other methods for the nomenclature of acyclic, Monocyclic, Fused polycyclic, Bridged and Spiro hydrocarbons and hetero systems.
**2510 (1+0)	**Recent Trends in Pharmaceutical Organic Chemistry:** الإتجاهات الحديثة فى الكيمياء العضوية الصيدلية The course aims at giving the students recent techniques in Pharmaceutical Organic Chemistry including the use of green chemistry as well as the new methodology in the synthesis of pharmaceutical products (microwave assisted synthesis, flow chemistry, biocatalysis, enzyme-mediated assisted synthesis or C-H activation).
**1501 (3+1)	**Advanced Pharmaceutical Organic Synthesis:** التشييد العضوى الصيدلى المتقدم A comprehensive course in the synthesis of organic and medicinal compounds using the concept of retrosynthetic analysis and the disconnection approach. The use of synthones and synthetic equivalents, functionilization and functional group interconversions and of protecting groups are illustrated. **Practical Course:-** Includes practical application for theoretical course.
**1502 (2+1)	**Experimental in Organic Pharmaceutical Chemistry:** التفاعلات العضوية الصيدلية العملية This course illustrates safety procedures and experimental techniques used in the synthesis, isolation, purification and identification of organic compounds. It is intended for graduate students starting their experimental research in organic chemistry. **Practical Course:-** Includes practical application for theoretical course.
1503 (0+2)	**Research Project (I):** مشروع بحثى(I) Choosing research subject of potential item in specialty.
2507 (1+0)	**Bioorganic Chemistry:** الكيمياء العضوية الحيوية Carbohydrates: Structure, stereochemistry, conformational analysis, chemical reactions and structure determination of carbohydrates. Proteins: Classification, stereochemistry, synthesis, chemical and some biochemical reactions of amino acids / secondary and tertiary structure of peptides / protein quaternary structure. Lipids: Structure, stereochemistry, biosynthesis of fatty acids.phospholipids, prostaglandins, terpenes, steroids and carotenoids.
**2508 (1+0)	**Pericyclic Reactions Chemistry (applications in Pharmaceutical Industry):** **الكيمياء الحول الحلقية وتطبيقاتها فى الصناعات الدوائية** Study of concerted reactions which obey principles of conservation of orbital symmetry. The course studies three types of pericyclic reactions; Electrocyclic Reactions, Cycloaddition Reactions and Sigmatropic Rearrangements. Modes of transition state structures leading to different stereochemical outcome are discussed. A brief introduction in Huckel MO theory is presented at the beginning of this course to familiarize the student with the subject. *** قرار وزارى رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢** **** تم استبدال الجدول بالجدول الصادر بالقرار الوزارى رقم (٢٠٠٤) بتاريخ ٢٠١٣/٨/١**

2509 **(1+0)**	**Advanced Heterocyclic Chemistry:** **الكيمياء الغير متجانسة المتقدمة** The aim of this course is to present a unified account of fundamental heterocyclic chemistry on an advanced level in order to give better and broader understanding of this important part of chemistry. Emphasis is placed on the correlation between the chemical reactivity of various heterocyclic ring systems. Synthesis of heterocyclic compounds using the disconnection approach and the biological significance of some heterocyclic systems are included.
2511 **(1+0)**	**Relating Structure to Chemical Reactivity:** **علاقة التركيب البنائى بالنشاط الكيميائى** A specific course on relating noncovalent interactions to reactivity, regio- and stereoselectivity of a reaction. Subjects such as steric effect, Neighbouring group participation, solvent effect and complex formation are discussed with illustrative examples.
1504 **(0+1)**	**Research Project (II):** **مشروع بحثى (II)** Choosing research subject in potential item of specialty.
1505 **(2+0)**	**Stereochemistry:** **الكيمـــياء الفراغـــية** Basics in stereochemistry/ chirality/ prochirality/ conformational analysis. Stereochemical aspects in drug- action and drug metabolism.
1506 **(3+0)**	**Nucleosides, Nucleotides and Nucleic acids:** **نيكلوسيدات ونيكلوتيدات والأحماض الجينية** Structure and chemistry of pyrimidines and purines / Nucleosides / Nucleotides / Bioenergetics / Secondary and Tertiary Structure of DNA / DNA profiling and sequencing. Synthesis and mechanism of action of anticancer / antiviral drugs.
1507 **(1+0)**	**Synthesis of Peptides and Peptidomimetics:** **تشييد البيتبيدات والبيبتيدات المشابهة** The strategy of peptide synthesis / Amino group Protection / Carboxyl group protection / Solid phase synthesis / Basics of making Peptidomimetics with illustrative examples.
****1508** **(2+0)**	**Selected Topics in Pharmaceutical Organic Reactions:** **موضوعات مختارة من التفاعلات العضويـــة الصيدلية** A course in advanced organic chemistry indented for students who have had the standard undergraduate organic and physical chemistry courses. The organization is based on reaction types, so the student can be shown that despite the large number of organic reactions, a relatively few principles suffice to explain nearly all of them. Accordingly, the course is divided into the following reactions/ mechanisms: Aliphatic Nucleophilic Substitution, Aromatic Nucleophilic Substitution, Aliphatic Electrophilic Substitution, Aromatic Electrophilic Substitution, Free Radical Substitution, Addition to C-C and C-Hetero multiple bonds, Elimination Reactions, Rearrangements and Oxidations and Reductions.

**** تم استبدال الجدول بالجدول الصادر بالقرار الوزارى رقم (٢٠٠٤) بتاريخ ٢٠١٣/٨/١**

Diploma of Drug Quality Control and Assurance

The candidate studies (14) compulsory courses and presents (1) research project as shown in the following table:

Exam. Marks			Exam. Hours			Credit Hours	Course Title	Code No.	Semester
Oral*	Practical	Written	Oral*	Practical	Written				
--	**50**	50	--	3	1	[1+1]	Computer Science (I). الكمبيوتر وتطبيقاته (I).	2001	First
--	--	100	--	--	2	[2+0]	Pharmaceutical Statistics. الإحصاء الصيدلى.	2002	
--	--	100	--	--	2	[2+0]	Mathematics. الرياضيات وتطبيقاتها.	1601	
15	**35**	100	1	3	2	[2+1]	Advanced Instrumental Analysis (I). التحليل الكيميائى المتقدم (I).	1602	
10	**40**	50	1	3	1	[1+1]	Stability–Indicating Methods. طرائق دراسة الثبات.	1603	
--	**50**	50	--	3	1	[1+1]	** Quality Control and Assurance of Natural Products رقابة وتأكيد الجودة للمنتجات الطبيعية	**1213	
--	**50**	50	--	3	1	[1+1]	Microbiology in Good Analytical Practice. الميكروبيولوجيا فى التحليل الكيميائى الجيد.	1422	
--	**100**	100	--	5	2	[2+2]	Bioanalysis of Hormones. التحليل الحيوى للهرمونات.	1318	
--	**50**	--	--	3	--	[0+1]	Computer Science (II). الكمبيوتر وتطبيقاته (II).	2003	Second
15	**35**	100	1	3	2	[2+1]	Advanced Instrumental Analysis (II). التحليل الكيميائى المتقدم (II).	1604	
--	--	50	--	--	1	[1+0]	Good Laboratory Practice (GLP). الممارسة الجيدة فى التحليل.	1605	
--	--	50	--	--	1	[1+0]	Stability of Pharmaceutical dosage forms دراسة الثبات للمستحضرات الصيدلية المختلفة.	1123	
--	--	100	--	--	2	[2+0]	Laboratory Audity for Quality. الرقابه المعملية للجوده.	1628	
--	--	100	--	--	2	[2+0]	Good Manufacturing practice, Quality control, Quality Assurance and validation الاداء التصنيعى الجيد، مراقبة وتاكيد الجودة والمصداقية فى الصناعة الصيدلية	2109	
--	**100**	--	--	--	--	[0+2]	Research Project. مشروع بحثى.	1606	
						31	**Total credit hours required**		

*** Oral Setting**

**** تم تغيير مسمى المقرر طبقاً للقرار وزارى رقم (٤٦١٣) بتاريخ ٢٠١٤/١٠/٢٢**

Course Content of Diploma of
Drug Quality Control and Assurance

Code No. & Credit Hours	Course Title and Content
2001 **(1+1)**	**Computer Science (I):** **الكمبيوتر وتطبيقاته (I)** Computer systems, types of computer available, A typical microcomputer configuration, computer hardware, numbers systems, the input devices, the output devices, the storage devices, computer software, statistical packages, database management packages, multimedia data management, communication packages, database digital analysis, computer graph sheets. **Practical Course:-** Computer Basics – MS Windows - MS Word.
2002 **(2+0)**	**Pharmaceutical Statistics:** **الإحصاء الصيدلى** Normal and binomial distribution. Probability, use of factorials, combinations and permutations. Measuring of central tendency and various distribution modes for pharmaceutical data. Significance. Testing, sampling procedures and outliers. T-test, ANOVA, line statistics, correlation and regression.
1601 **(2+0)**	**Mathematics:** **الرياضيات وتطبيقاتها** Determinants and matrices, numerical integrations, curve fitting approximation, energy levels and molecular orbitals, spectrophotometric analysis, pharmacokinetics [dilution problems].
1602 **(2+1)**	**Advanced Instrumental Analysis (I) :** **التحليل الكيميائى المتقدم(I)** Philosophy of analysis, general analytical techniques, spectro [I], spectro [II] including instrumental application, mass spectrometry, nuclear magnetic resonance, infra – red absorption spectroscopy, functional group analysis and thermal analysis. **Practical Course:-** Includes practical application for theoretical course.
1603 **(1+1)**	**Stability–Indicating Methods:** **طرائق دراسة الثبات** Definition, separation of the degradation product from the intact drug based on different types of chromatography, selective extraction and spectroscopy. **Practical Course:-** Includes practical application for theoretical course.
***1213** **(1+1)**	***Quality Control and Assurance of Natural Products:** **رقابة وتأكيد الجودة للمنتجات الطبيعية** Natural products are important components of drugs. The course shed light on upon the quality control and structure elucidation of natural products. **Practical Course:-** Includes practical application for theoretical course.
1422 **(1+1)**	**Microbiology in Good Analytical Practice :** **الميكروبيولوجيا فى التحليل الكيميائى الجيد** Aseptic techniques, different methods of sterilization of pharmaceutical preparations, validation of the sterilization process, methods for assessment of antimicrobial activity, microbiological assay for antibiotics, evaluation of non antibiotics antimicrobial agents, quality control procedures to assure high level of confidence and standardization of the procedures used in quality control. **Practical Course:-** Includes practical application for theoretical course.
1318 **(2+2)**	**Bioanalysis of Hormones:** **التحليل الحيوى للهرمونات** Bioassay of insulin – Bioassay of Oxytocin hormone – Bioassay of ACTH hormone. **Practical Course:-** Includes practical application for theoretical course. *** تم تغيير مسمى المقرر طبقاً للقرار وزاري رقم (٤٦١٣) بتاريخ ٢٠١٤/١٠/٢٢**

2003 **(0+1)**	**Computer Science (II):** **الكمبيوتر وتطبيقاته(II)** **Practical Course:-** MS Excel – MS Power Point - Internet.
1604 **(2+1)**	**Advanced Instrumental Analysis (II):** **التحليل الكيميائى المتقدم(II)** Chromatography adsorption, partitioning, column chromatography, ion- exchange chromatography, gel filtration, gas chromatography, HPLC, electroanalysis, potentiometry, conductometry, voltammetry and electrophoresis. **Practical Course:-** Includes practical application for theoretical course.
1605 **(1+0)**	**Good Laboratory Practice [GLP]:** **الممارسة الجيدة فى التحليل** Introduction, terminology and definitions, laboratory performance, data processing, microbiological quality control, pharmacological quality control, accredition criteria, collaborative testing ……. etc.
1123 **(1+0)**	**Stability of Pharmaceutical dosage forms:** **دراسة الثبات للمستحضرات الصيدلية المختلفة** Reaction kinetics and drug stability which includes: reaction orders, complex reaction orders: Parallel and consecutive reactions, Accelerated, shelf-life, stability program and factorial design.
1628 **(2+0)**	**Laboratory Audity for Quality:** **الرقابه المعملية للجوده** Iso certificate – Iso – 17025 – Accreditation program – Guide to quality in analytical chemistry – Accreditation for Microbiological lab.
2109 **(2+0)**	**Good Manufacturing practice, Quality control, Quality Assurance and Validation:** **الاداء التصنيعى الجيد، مراقبة وتاكيد الجودة والمصداقية فى الصناعة الصيدلية** Quality, quality control, quality management, process control, material control, GMP, Personnel, buildings, equipment, production procedures, packaging and validation. Basic requirements for pharmaceutical quality management. Total quality management. Quality costs. Manufacturing quality management. Process flow charts, process flow analysis, process specification, process validation. Regulatory aspects, design and performance qualification. Documentation.
1606 **(0+2)**	**Research Project:** **مشروع بحثى** Choosing research subject of potential item in specialty.

**Diploma of Biochemical Analysis

The candidate studies (9) compulsory courses and presents (1) scientific article as shown in the following table:

Exam. Marks			Exam. Hours			Credit Hours	Course Title	Code No.	Semester
Oral*	Practical	Written	Oral*	Practical	Written				
20	30	150	--	3	3	[3+1]	Advanced Biochemistry (I). كيمياء حيوية متقدمة (I).	1701	First
20	30	150	--	3	3	[3+1]	Chemical Pathology (I). الباثولوجيا الكيميانية (I).	1702	
--	--	100	--	--	2	[2+0]	Physiology. الفسيولوجيا.	1703	
--	50	100	--	3	2	[2+1]	Histology. الهستولوجيا.	1704	
--	--	100	--	--	2	[2+0]	Advanced Methods of Instrumental Analysis. طرائق التحليل الآلي المتقدمة.	2601	
30	70	150	--	6	3	[3+2]	Advanced Biochemistry (II). كيمياء حيوية متقدمة (II).	1705	Second
20	30	150	--	3	3	[3+1]	Chemical Pathology (II). الباثولوجيا الكيميانية (II).	1706	
--	--	50	--	--	1	[1+0]	Pathology. الباثولوجيا.	1707	
--	--	50	--	--	1	[1+0]	Clinical Nutrition. التغذية الأكلينيكية.	1708	
200	--	--	--	--	--	[0+4]	Scientific Article. مقالة علمية.	1709	
						30	Total credit hours required		

*** Oral Setting**

**** قرار وزاري رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

*Course Content of Diploma of Biochemical Analysis

Code No. & Credit Hours	Course Title and Content
1701 **(3+1)**	**Advanced Biochemistry (I):** **كيمياء حيوية متقدمة (I)** 1- Biochemical functions of subcellular organelles and biomembrane. 2- Amino acids and proteins. 3- Enzymes. 4- Nucleotides and nucleic acids. 5- Chemistry and metabolism of porphyrins. 6- Blood and other tissue fluids. 7- Vitamins. 8- Minerals. 9- Acid-base balance. **Practical Course:-** Includes practical application for theoretical course.
1702 **(3+1)**	**Chemical Pathology (I):** **الباثولوجيا الكيميائية (I)** 1- Basic concepts in laboratory investigation. 2- Diagnostic Enzymology. 3- Water, electrolyte and hydrogen ion disorders. 4- Respiratory disorders. 5- Cardiovascular disorders. 6- Porphyrins and the hemeproteins. 7- Hepatobiliary disorders. 8- Disorders of minerals and trace elements. 9- Disorders of vitamins metabolism. **Practical Course:-** Includes practical application for theoretical course.
1703 **(2+0)**	**Physiology:** **الفسيولوجيا** **1- Kidney:** a) Nephron. b) Glomerular filtration rate. c) Tubular reabsorption and secretion. d) Plasma clearance. e) Homeostatic function of kidney in regulation of hydrogen ion concentration. f) Kinney function tests. **2- Blood:** a) Plasma and plasma proteins. b) R. B. Cs, formation, anémia. c) Blood indices. d) Blood groups. e) Homeostasis. f) Leucocytes. g) Immunity. h) Respiratory functions of blood. **3- Liver:** a) General function. b) Bile pigment metabolism. c) Bile salts. d) Liver function tests.

	4- Endocrinology: a) Mechanism of hormone action. b) Assess of hormonal function. c) Pituitary gland. d) Thyroid gland e) Parathyroid gland. f) Pancreas. g) Reproduction. In all endocrine glands disturbance [hypo – and hyper – function is discussed].
1704 **(2+1)**	**Histology:** **الهستولوجيا** **1- Microscopy:** Light microscope, electron microscope, ultraviolet microscope, fluorescent microscope and phase contract microscope. **2- Microtechniques:** a) Paraffin technique. b) Celloidin technique. c) Freezing technique. **3- Types of stain:** a) Acidic, basic and neutral stains. b) Vital, superavital and physical stains. c) Metachromatic stains. d) Histochemistry and cytochemistry. e) Immunocytochemistry. **4- The cell:** a) The normal and abnormal blood picture. b) The red blood count. c) The total leucocytic count. d) The differential leucocytic count. e) Blood platelets: structure, function and counting. f) Myeloid tissue and development of blood cells. **5- Microscopy:** Correlation between the detailed structure and clinical application of the exocrine and endocrine parts of the organ. **6- Endocrine glands:** a)Suprarenal gland: the structure functional relationship of the cortex and medulla of the suprarenal gland and the paraganglia. The different stains of the suprarenal gland and its blood supply. b)Pituitary gland: the histological details about the contents of the anterior and posterior lobes of the pituitary gland and their clinical significance. c) Thyroid gland. d) Parathyroid gland. e) Pineal body. f) The chemoreceptors. **Practical Course:-** Includes practical application for theoretical course.
2601 **(2+0)**	**Advanced Methods of Instrumental Analysis:** **طرائق التحليل الآلى المتقدمة** This course includes the study of molecular absorption and emission, visible – ultraviolet, infrared, atomic absorption and emission, nuclear magnetic resonance principles, instruments, recent trends and analytical applications of these methods and electrochemical methods of analysis.

1705 **(3+2)**	**Advanced Biochemistry (II):** **كيمياء حيوية متقدمة(II)** 1- Biological oxidation. 2- Carbohydrates chemistry and metabolism. 3- Lipid chemistry and metabolism. 4- Amino acid and nitrogen metabolism. 5- Hormones. 6- Interrelation of different metabolic pathways in different tissues.
1706 **(3+1)**	**Chemical Pathology (II):** **الباثولوجيا الكيميائية(II)** 1- Gastrointestinal and pancreatic disorders. 2- Disorders of carbohydrate metabolism. 3- Disorders of amino acid and protein metabolism. 4- Disorders of lipid metabolism. 5- Disorders of nucleic acids, purine and pyrimidine metabolism. 6- Endocrine disorders. 7- Disorders of kidney and urinary tract. 8- Cancer associated biochemical abnormalities. 9- Coagulation pathways and diseases of their defect.
1707 **(1+0)**	**Pathology:** **الباثولوجيا** **- General pathology:** **1- Inflammation.** **2- Repair.** **3- Cell response injury:** a) Degradation. b) Necrosis. c) Gangrene. **4- Tissue deposits:** a) Amyloidosis. b) Pathological calcification. c) Pigment deposits. **5- Circulatory disturbances:** a) Congestion. b) Thrombosis. c) Oedema. d) Shock. e) Embolism. **6- Granulomata:** a) Bilharziasis. b) Tuberculosis. c) Syphilis. **7- Infection.** **8- Disorders of growth:** a) Hypertrophy. b) Hyperplasia. c) Neoplasia. **-**Clinicopathological application in: 1- Liver and kidney diseases. 2- Cardiovascular system. 3- Lymphoid system.

1708 **(1+0)**	**Clinical Nutrition:** **التغذية الأكلينيكية** 1- Calorimetry: BMR; measurements of energy requirements and RDA. 2- Nutrients: carbohydrates, fats, Proteins, minerals and vitamins requirements for adults and during infancy, childhood, and pregnancy. 3- Diet Therapy in: a) Obesity. b) Under weight. c) Bone and joint diseases. d) Diseases of the heart. e) Renal diseases.
1709 **(0+4)**	**Scientific Article:** **مقالة علمية** Scientific Article in an advanced topic in the field.

* Diploma of Drug Discovery

The candidate studies (11) courses and presents (1) research project as shown in the following table:

Exam. Marks			Exam. Hours			Credit Hours	Course Title	Code No.	Semester
Oral	Practical	Written	*Oral	Practical	Written				
---	---	150	---	---	3	[3+0]	Principles of Drug Discovery and Development. أساسيات إكتشاف الدواء وتطويره	1801	First
---	---	50	---	---	1	[1+0]	Pharmaceutical Bioinformatics. المعلوماتية الحيوية الصيدلية	1802	
---	---	50	---	---	1	[1+0]	Pharmacoeconomics. اقتصاديات الدواء	1803	
---	---	100	---	---	2	[2+0]	Targets of Drug Design (Enzymes, Receptors, Nucleic Acids, etc.) أهداف تصميم الدواء (الأنزيمات، المستقبلات،الأحماض النووية، ....)	1804	
---	100	100	---	5	2	[2+2]	Qualitative and Quantitative Structure-Activity Relationships العلاقات النوعية والكمية بين التركيب البنائى و فاعلية الدواء	1805	
---	100	---	---	5	---	[0+2]	Applications of Computer Graphics to Drug Design. تطبيقات رسوم الحاسب الآلي فى تصميم الدواء	1806	
---	---	100	---	---	2	[2+0]	Pharmaceutical Synthone and Combinatorial Chemistry المصنعات الصيدلية والكيمياءالإندماجية	1807	Second
---	---	200	---	---	3	[4+0]	Computer- Aided Drug Design إستخدامات الحاسب الآلي فى تصميم الدواء	1808	
---	100	---	---	5	---	[0+2]	Computer-Based Molecular Modelling النمذجة الجزيئية المعتمدة على الحاسب الآلي	1809	
---	50	100	---	3	2	[2+1]	Advanced Analytical Techniques for Drug Discovery. طرق تحليلية متقدمة لاكتشاف الدواء	1810	
---	---	100	---	---	2	[2+0]	Metabolism in Drug Discovery الأيض (التمثيل الغذائى) فى اكتشاف الدواء	1811	
100	---	---	---	---	---	[0+2]	Research Project المشروع البحثى	1812	
						28	Total credit hours required		

Written, 19 (68 %); Practical, 7 (25 %); Project, 2 (7 %)

***Oral Setting**

**** تم الموافقة على الخطة الدراسية الخاصة بدبلوم اكتشاف الأدوية بقرار وزاري رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

*Course Content of Diploma of Drug Discovery

Code No. & Credit Hours	Course Title and Content
1801 [3+0]	**Principles of drug discovery and development** **أساسيات إكتشاف الدواء وتطويره** This topic underlies the stages and strategies of drug discovery either from natural or synthetic sources, a background on the effect of chemical structure of a drug on its action (including physicochemical aspects) and the development of new drugs through modification of natural or existing drugs with special emphasis on the principles of lead optimization. Preclinical and clinical studies in drug development will be covered.
1802 [1+0]	**Pharmaceutical Bioinformatics** **المعلوماتية الحيوية الصيدلية** The course provides basic knowledge for the use of bioinformatics methods in pharmacy and pharmaceutical chemistry. It presents molecular biology databases, molecular representations, calculation of molecular properties, statistical experimental design, screening and data analysis. The analysis of macromolecular sequences (search, alignment, macromolecular descriptors QSAR and proteochemometrics), validation of models, lead identification and optimization.
1803 [1+0]	**Pharmacoeconomics** **اقتصاديات الدواء** This course will cover fundamental concepts of the drug development process in the context of its economic, legal and regulatory aspects. The student will learn how to compare the value of one pharmaceutical drug or drug therapy to another in terms of cost and effects. The candidate should be able to identify and describe different types of economic and humanistic evaluations: cost-minimization analysis, cost-benefit analysis, cost-effectiveness analysis and cost-utility analysis. The course also discusses how pharmacoeconomic data can be used to help gain formulary approval for pharmaceutical products.
1804 [2+0]	**Targets of Drug Design (Enzymes, Receptors, Nucleic Acids, etc.)** **أهداف تصميم الدواء (الأنزيمات،المستقبلات، الأحماض النووية، ....)** Different drug targets including enzymes, receptors and nucleic acids will be studied. This will include the principles of enzyme kinetics and the rationale design of enzyme inhibitors and activators applying different strategies. Theories of receptor site, together with the different aspects of second and third messengers will be covered. The discovery and design of receptor agonists or antagonists will be included. Enzyme/Receptor binding and functional assays, in addition to high throughput screening will be studied.
1805 [2+2]	**Qualitative and Quantitative Structure-Activity Relationships** **العلاقات النوعية والكمية بين التركيب البنائى و فاعلية الدواء** A specific course designed to find relationships between chemical structure (and structural-related properties) and biological activity (or target property) of studied compounds. The objectives of SAR are two-fold. First, to determine as accurately as possible the limits of variation in the structure of a chemical that are consistent with the production of a specific effect (e.g., can a chemical elicit a specific toxic endpoint). Second, to define the ways, which alterations in structure and thereby the overall properties of a compound influence endpoint potency. *** تم الموافقة على الخطة الدراسية الخاصة بدبلوم اكتشاف الأدوية بقرار وزاري رقم (٣١٥١) بتاريخ ٢٠١٢/٨/٢**

1806 [0+2]	**Applications of Computer Graphics to Drug Design** **تطبيقات رسوم الحاسب الآلي فى تصميم الدواء** This includes practical application of some drug design strategies and tools (direct/indirect drug design, electrostatic potential maps, prediction of some physicochemical parameters,...etc) using molecular modelling softwares such as MOE, ACD labs,...etc
1807 [2+0]	**Pharmaceutical Synthone and Combinatorial Chemistry** **المصنعات الصيدلية والكيمياء الإندماجية** The course deals with principles of combinatorial chemistry and the use of versatile synthones in designing and synthesis of new biologically active compounds leading to facile and easy way for preparation of compounds. This include: polymers, solid phase synthesis, design of molecules, new catalysts, high through output screening, etc.
1808 [4+0]	**Computer-Aided Drug Design** **إستخدامات الحاسب الآلي فى تصميم الدواء** The course deals with different principles of computer in drug design. This include: structure based drug design, ligand based drug design, docking of small molecules, active site recognition, pharmacophore elucidation and pharmacophore search as well as dealing with different softwares considered with visualization and calculations of drug receptor interactions.
1809 [0+2]	**Computer-Based Molecular Modelling** **النمذجة الجزيئية المعتمددة على الحاسب الآلي** The course deals practically with different aspects used recently in molecular modelling based on different computer software including: Molecular mechanics, molecular dynamics, energy minimization, application to flexible alignment, docking, pharmacophore search, drug receptor interactions and 3D QSAR.
1810 [2+1]	**Advanced analytical techniques for Drug Discovery** **طرق تحليلية متقدمة لاكتشاف الدواء** This course involves the use of spectrophotometric, spectrofluorimetric and chromatographic techniques such as adsorption and partition column chromatography, ion-exchange chromatography, planar chromatography and gas chromatography. In addition, electrochemical techniques as potentiometry, voltammetry and capillary electrophoresis are also discussed.
1811 [2+0]	**Metabolism in Drug Discovery** **الأيض (التمثيل الغذائى) فى اكتشاف الدواء** Preclinical drug metabolism plays a key role in lead identification and optimization. This course begins with an introduction of the fundamentals of drug metabolism: metabolite identification, evaluation of metabolic pathways and rates, metabolite stability and toxicity and the specific isozymes involved in the metabolism are also studied.

1812 [0+2]	**Research Project** **المشروع البحثى** The student will be engaged in learning the critical steps involved in the discovery and optimization of the drug while developing an understanding of managerial challenges at each point in the pathway. This problem- based course will involve partnerships in which student teams will research and identify potential drug targets in one or more therapeutic areas to develop a case study of how a specific drug was developed for a therapeutic condition.

Courses of Doctor of Pharmacy Program

Doctor of Pharmacy Degree

The candidate studies (13) compulsory courses during the first year as shown in the following table:

Exam. Marks		Exam. Hours		Credit	Course Title	Code No.	Semester
Oral*	Written	Oral*	Written	Hours			
40	160	1	3	[4+0]	Clinical Pharmacokinetics. حركية دواء أكلينيكية.	2902	First
30	120	1	3	[3+0]	Pharmacy Practice (I). ممارسة صيدلية (I).	1901	
20	80	1	2	[2+0]	Infectious Disease Therapeutics. علاج الأمراض المعدية.	1902	
20	80	1	2	[2+0]	GIT Therapeutics. علاج أمراض الجهاز الهضمي.	1903	
20	80	1	2	[2+0]	Pharmaceutical Care for Patients With Immunological Disorders. الرعاية الصيدلية لحالات نقص المناعة.	1904	
20	80	1	2	[2+0]	Pharmaceutical Care for Patients With Endocrine Disorders. الرعاية الصيدلية لحالات إختلال الغدد.	1905	
30	120	1	3	[3+0]	Oncology Therapeutics. علاج حالات الأورام.	1906	
30	120	1	3	[3+0]	Bases of Therapeutic Literature Evaluation and Biostatistics. مبادئ تقييم المؤلفات العلاجية وعلوم الأحصاء الحيوية.	1907	Second
30	120	1	3	[3+0]	Pharmacy Practice (II). ممارسة صيدلية (II).	1908	
30	120	1	3	[3+0]	Pharmaceutical Care for Patients With Cardiovascular Disorders. الرعاية الصيدلية في حالات أمراض القلب والأوعية الدموية.	1909	
30	120	1	3	[3+0]	Pharmaceutical Care for Patients With Structural or Neurological Disorders. الرعاية الصيدلية في حالات الكسور والأمراض العصبية.	1910	
30	120	1	3	[3+0]	Pharmaceutical Care for Patients With Renal Disorders. الرعاية الصيدلية لمرضى القصور الكلوى.	1911	
30	120	1	3	[3+0]	Pharmaceutical Care for Patients With Respiratory Disorders. الرعاية الصيدلية لمرضى القصور التنفسي.	1912	
				36	Total credit hours required		

*** Oral Setting**

Course Content of Doctor of Pharmacy Degree

Code No. & Credit Hours	Course Title and Content
2902 **(4+0)**	**Clinical Pharmacokinetics:** **حركية دواء أكلينيكية** Introduction to advanced concept in clinical pharmacokinetics with emphasis on special patient populations and specific drugs. Drug dosing to renal impaired patients and patients with liver problems will be of interest. Mechanisms and kinetics of drug clearance through liver enzymes and cytochrom P 450 system will be discussed.
1901 **(3+0)**	**Pharmacy Practice (I):** **ممارسة صيدلية(I)** Pharmacy practice I provides fundamental understanding of functions, responsibilities, and outcomes of pharmacy practice in modern health care system. Introducing fundamental concepts of pharmaceutical care and patient counseling with emphasis on communication skills, patient interview and medical history documentation. The course will give special interest for special patient groups [geriatric, pediatric, etc….] The course also introduces the basic techniques of physical assessment. Student will apply their medical information on several patient eases and therapeutic plans through problem based learning technique.
1902 **(2+0)**	**Infectious Disease Therapeutics:** **علاج الأمراض المعدية** Introduces different antibiotics, antifungal and antiviral therapy. Case discussion incorporated for various disease states, with emphasis on drug interactions, adverse drug reactions, dosing monitoring and patient counseling.
1903 **(2+0)**	**GIT Therapeutics:** **علاج أمراض الجهاز الهضمى** Provides fundamental understanding of gastrointestinal tract and pathophysiology of different diseases. Topics include conditions such as peptic ulcer, irritable bowel syndrome, gastrointestinal reflux disease and drug induce peptic ulcers will be discussed through the course with emphasis on therapeutic option and significant drug interaction and patient counseling.
1904 **(2+0)**	**Pharmaceutical Care for Patients With Immunological Disorders:** **الرعاية الصيدلية لحالات نقص المناعة** Pathophysiology/pharmacotherapy of common immunological disorders. Topics include conditions such as autoimmune diseases such as rheumatic disease, AIDS, hepatitis pernicious anaemia, mephitis, vitiligo, multiple sclerosis.
1905 **(2+0)**	**Pharmaceutical Care for Patients With Endocrine Disorders:** **الرعاية الصيدلية لحالات إختلال الغدد** The concepts of pharmaceutical with care are applied in an integrated manner with clinical sciences for patients with endocrine disorders. Topics include conditions such as diabetes mellitus; hyperthyroidism and hypothyroidism will be discussed in details with emphasis on therapeutic choices, drug interaction, therapeutic monitoring and patient counseling.
1906 **(3+0)**	**Oncology Therapeutics:** **علاج حالات الأورام** Provides understanding of basic principles of oncology. Topics such as breast cancer, leukemia and liver cancer will be discussed with emphasis on therapeutic choices, side effects, therapeutic monitoring, drug interaction and patient counseling. Nutritional support and psychological state of the cancer patients will be also introduced in brief.
1907 **(3+0)**	**Bases of Therapeutic Literature Evaluation and Biostatistics:** **مبادئ تقييم المؤلفات العلاجية وعلوم الأحصاء الحيوية** Provides the basic information about literature criticism and how to evaluate information through certain scientific criteria. Basic biostatistics with regard to clinical trials using case study analysis. Introducing experimental design for clinical studies and methods of analysis in each design.

1908 **(3+0)**	**Pharmacy Practice (II):** **ممارسة صيدلية(II)** Pharmacy practice II provides information about OTC drug and the most common OTC products in the market with regard to the different body system. The course will discuss the condition, the OTC product and the required or desired outcome for this condition and the monitoring parameters and follow up timing with special interest in the important points that should be mentioned during patient counseling for each product (if any).
1909 **(3+0)**	**Pharmaceutical Care for Patients With Cardiovascular Disorders:** **الرعاية الصيدلية فى حالات أمراض القلب والأوعية الدموية** Provides basic information about circulatory system and pathophysiology of circulatory disorders. Topics such as hypertension, lipid disorders, cerebral and peripheral vascular disorders as well as anticoagulation will be of main interest in the course regarding pharmacotherapeutic choices and rationale for each choice.
1910 **(3+0)**	**Pharmaceutical Care for Patients With Structural or Neurological Disorders:** **الرعاية الصيدلية فى حالات الكسور والأمراض العصبية** Provides information about pathophysiology and pharmacotherapeutic choices to treat condition affecting structure such as osteoporosis, arthritis, and osteomyelitis and conditions affecting the nervous system such as pain, headache, migraine and Parkinsonism.
1911 **(3+0)**	**Pharmaceutical Care for Patients With Renal Disorders:** **الرعاية الصيدلية لمرضى القصور الكلوى** The concepts of pharmaceutical care are applied in an integrated manner with pharmaceutical and clinical sciences for patients with renal disorders. Topics include acute and chronic glomerulonephritis, urinary tract infections, drug induced renal disorders, acute and chronic renal failure and drug dosing in renally impaired patients.
1912 **(3+0)**	**Pharmaceutical Care for Patients With Respiratory Disorders:** **الرعاية الصيدلية لمرضى القصور التنفسى** The concepts of pharmaceutical care are applied in an integrated manner with pharmaceutical and clinical sciences for patients with respiratory disorders. Topics including conditions such as asthma, chronic obstructive pulmonary disease, pneumonia, and lung cancer will be discussed through the course regarding the pathophysiology and therapeutic choices.

Doctor of Pharmacy Degree

The candidate should accomplish (2) compulsory rotation and (4) elective clinical rotations during the second year as shown in the following table:

Credit Hours	Clinical Rotation Title		Code No.
6	Compulsory Rotation	Ambulatory Care. الرعايـــة المتنقلـــة.	1913
6		Hospital Pharmacy Practice. ممارســـة صيدلـــية المستشفـــيات.	1914
6	Elective Rotations	Drug Information. معلومـــات دوائيـــة.	1915
6		Patient Care for Chronic Diseases. الرعايـــة العلاجـــية للأمـــراض المزمـــنة.	1916
6		Nephrology. رعايـــة أمـــراض الكلـــى.	1917
6		Cardiology. رعايـــة أمـــراض القلـــب.	1918
6		Infectious Disease. رعايـــة الأمـــراض المنقولـــة بالعـــدوى.	1919
6		Oncology. رعايـــة مرضى السرطان.	1920
36	Total credit hours required		

Courses of Master in Pharmaceutical Sciences Programs

Master Degree in Pharmaceutical Sciences

[General Courses – Faculty Requirements]

The candidate studies the compulsory courses as shown in the following table:

Exam. Marks		Exam. Hours		Credit Hours	Course Title	Code No.	Semester
Practical	Written	Practical	Written				
50	50	3	1	[1+1]	Computer Science (I). الكمبيوتر وتطبيقاته (I).	2001	First
--	100	--	2	[2+0]	Pharmaceutical Statistics. الإحصاء الصيدلى.	2002	
50	--	3	--	[0+1]	Computer Science (II). الكمبيوتر وتطبيقاته (II).	2003	Second
--	50	--	1	[1+0]	Scientific Writing. كتابة علمية.	2004	
				6	Total credit hours required		

Courses Content of Master Degree in
Pharmaceutical Sciences
[General Courses – Faculty Requirements]

Code No. & Credit Hours	Course Title and Content
2001 **(1+1)**	**Computer Science (I):** **الكمبيوتر وتطبيقاته (I)** Computer systems, types of computer available, A typical microcomputer configuration, computer hardware, numbers systems, the input devices, the output devices, the storage devices, computer software, statistical packages, database management packages, multimedia data management, communication packages, database digital analysis, computer graph sheets. **Practical Course:-**Computer Basics – MS Windows - MS Word.
2002 **(2+0)**	**Pharmaceutical Statistics:** **الإحصاء الصيدلى** Normal and binomial distribution. Probability, use of factorials, combinations and permutations. Measuring of central tendency and various distribution modes for pharmaceutical data. Significance. Testing, sampling procedures and outliers. T-test, ANOVA, line statistics, correlation and regression.
2003 **(0+1)**	**Computer Science (II):** **الكمبيوتر وتطبيقاته (II)** **Practical Course:-**MS Excel – MS Power Point - Internet.
2004 **(1+0)**	**Scientific Writing:** **كتابة علمية** Choosing a research problem, using library, first step in treating data, writing paper, making the paper interesting, correcting the type written copy, good form and using tables and illustration, prepublication review, Bibliography, Index.

Master Degree in Pharmaceutical Sciences [Pharmaceutics]

The candidate studies (5) compulsory courses and chooses (1) elective course as shown in the following table:

Exam. Marks	Exam. Hours	Credits Hour		Course Title	Code No.	Semester
100	2	[2+0]	Compulsory Courses	Physical Pharmacy. صيدلة فيزيائية.	2101	First
100	2	[2+0]		Dosage Form Design. تصميم الأشكال الصيدلية.	2103	
100	2	[2+0]		Advanced Drug Delivery Systems. أنظمة توصيل أدوية متقدمة.	2105	
100	2	[2+0]	Elective Courses	Good Manufacturing Practice, Quality Control, Quality Assurance and Validation الأداء التصنيعى الجيد، مراقبة وتأكيد الجودة والمصداقية فى الصناعات الصيدلية	2109	
100	2	[2+0]	Compulsory Courses	Drug Stability in dosage forms. ثبات الأدوية فى المستحضرات الصيدلية.	2102	Second
100	2	[2+0]		Biopharmaceutics and Applied Pharmacokinetics. الصيدلة الحيوية وحركية الدواء التطبيقية.	2104	
100	2	[2+0]	Elective Courses	Cosmetics. مستحضرات تجميل.	2106	
100	2	[2+0]		Radiopharmaceuticals. المواد الصيدلية المشعة.	2107	
		12	Total credit hours required			

Course Content of Master Degree in Pharmaceutical Sciences [Pharmaceutics]

Code No. & Credit Hours	Course Title and Content
2101 **(2+0)**	**Physical Pharmacy:** **صيدلة فيزيائية** States of matter. Thermodynamics. Physical properties of molecules. Solubility and distribution phenomena – complexation and protein binding. Interfacial phenomena. Polymers in pharmacy. Rheology.
2102 **(2+0)**	**Drug Stability in dosage forms:** **ثبات الأدوية فى المستحضرات الصيدلية** Reaction kinetics and drug stability which includes: reaction orders, complex reaction orders: Parallel and consecutive reactions, Dosage forms instability. Routes of degradation Accelerated, stability program.
2103 **(2+0)**	**Dosage Form Design:** **تصميم الأشكال الصيدلية** Sustained release products: classification, advantages, physicochemical and biological properties of drugs, formulation methods. Microencapsulation. Tablets and capsules, Sterile products. Suppositories. Coarse dispersions. Topical products and aerosols.
2104 **(2+0)**	**Biopharmaceutics and Applied Pharmacokinetics:** **الصيدلة الحيوية وحركية الدواء التطبيقية** Definitions, factors affecting drug absorption, dissolution: Pharmacopeial and non-Pharmacopeial and biopharmaceutics classification system,Intravenous and oral single dose. Multiple dosing. Compartmental and non compartmental models. Drug clearance. Nonlinear pharmacokinetics. Bioavailability and bioequivalence.
2105 **(2+0)**	**Advanced Drug Delivery Systems:** **أنظمة توصيل أدوية متقدمة** Red blood cells as drug carriers, mucoadhesive drug delivery, transdermal drug delivery and intranasal drug delivery, Drug targeting Nano-Technology.
2106 **(2+0)**	**Cosmetics:** **مستحضرات تجميل** Technology of cosmetics, Skin products, Dental products, Hair care products, Foot and nail care, Packaging and Pharmaceutical evaluation of cosmetic preparations.
2107 **(2+0)**	**Radiopharmaceuticals:** **المواد الصيدلية المشعة** Radiation types, Radioactive decay and types of decay, Doses of radiation, human protection. Application of radiopharmaceuticals in diagnosis and treatment.
2109 **(2+0)**	**Good Manufacturing practice, Quality control, Quality Assurance and Validation:** **الاداء التصنيعى الجيد، مراقبة وتاكيد الجودة والمصداقية فى الصناعة الصيدلية** Quality, quality control, quality management, process control, material control, GMP, Personnel, buildings, equipment, production procedures, packaging and validation. Basic requirements for pharmaceutical quality management. Total quality management. Quality costs. Manufacturing quality management. Process flow charts, process flow analysis, process specification, process validation. Regulatory aspects, design and performance qualification. Documentation.

Master Degree in Pharmaceutical Sciences

[Industrial Pharmacy]

The candidate studies (5) compulsory courses and chooses (1) elective course as shown in the following table:

Exam. Marks	Exam. Hours	Credits Hour		Course Title	Code No.	Semester
100	2	[2+0]	Compulsory Courses	Physical Pharmacy. صيدلة فيزيائية.	2101	First
100	2	[2+0]		Dosage Form Design. تصميم الأشكال الصيدلية.	2103	
100	2	[2+0]		Good Manufacturing Practice, Quality Control, Quality Assurance and Validation الأداء التصنيعى الجيد، مراقبة وتأكيد الجودة والمصداقية فى الصناعات الصيدلية	2109	
100	2	[2+0]		Drug Stability in dosage forms. ثبات الأدوية في المستحضرات الصيدلية.	2102	Second
100	2	[2+0]		Scale up techniques in pharmaceutical industries تقنيات التصعيد في الصناعات الصيدلية.	2110	
100	2	[2+0]	Elective Courses	Cosmetics. مستحضرات تجميل.	2106	
100	2	[2+0]		Radiopharmaceuticals. المواد الصيدلية المشعة.	2107	
100	2	[2+0]		Mechanical Utilities & Services الخدمات والامكانيات الميكانيكية	2111	
		12		Total credit hours required		

Course Content of Master Degree in Pharmaceutical Sciences

[Industrial Pharmacy]

Code No. & Credit Hours	Course Title and Content
2101 **(2+0)**	**Physical Pharmacy:** صيدلة فيزيائية States of matter. Thermodynamics. Physical properties of molecules. Solubility and distribution phenomena – complexation and protein binding. Interfacial phenomena. Polymers in pharmacy. Rheology.
2102 **(2+0)**	**Drug Stability in dosage forms:** ثبات الادوية فى المستحضرات الصيدلية Reaction kinetics and drug stability which includes: reaction orders, complex reaction orders: Parallel and consecutive reactions, Dosage forms instability. Routes of degradation Accelerated, stability program.
2103 **(2+0)**	**Dosage Form Design:** تصميم الأشكال الصيدلية Sustained release products: classification, advantages, physicochemical and biological properties of drugs, formulation methods. Microencapsulation. Tablets and capsules, Sterile products. Suppositories. Coarse dispersions. Topical products and aerosols.
2109 **(2+0)**	**Good Manufacturing practice, Quality control, Quality Assurance and Validation:** الاداء التصنيعى الجيد، مراقبة وتاكيد الجودة والمصداقية فى الصناعة الصيدلية Quality, quality control, quality management, process control, material control, GMP, Personnel, buildings, equipment, production procedures, packaging and validation. Basic requirements for pharmaceutical quality management. Total quality management. Quality costs. Manufacturing quality management. Process flow charts, process flow analysis, process specification, process validation. Regulatory aspects, design and performance qualification. Documentation.
2110 **(2+0)**	**Scale up techniques in pharmaceutical industries:** تقنيات التصعيد فى الصناعات الصيدلية Problems evolved during transfer the formula from laboratory scale to industrial scale – How to solve different problems of scaling up- case study.
2106 **(2+0)**	**Cosmetics:** مستحضرات تجميل Technology of cosmetics, Skin products, Dental products, Hair care products, Foot and nail care, Packaging and Pharmaceutical evaluation of cosmetic preparations.
2107 **(2+0)**	**Radiopharmaceuticals:** المواد الصيدلية المشعة Radiation types, Radioactive decay and types of decay, Doses of radiation, human protection. Application of radiopharmaceuticals in diagnosis and treatment.
2111 **(2+0)**	**Mechanical Utilities & Services:** الخدمات والامكانيات الميكانيكية Design of facility utility -mechanical systems-heating-ventilation-air conditioning systems-Fire protection systems- piping systems- Purified water station-vacuum-Process gases.

Master Degree in Pharmaceutical Sciences [Pharmacognosy]

The candidate studies (9) compulsory courses and chooses (1) elective course as shown in the following table:

Exam. Marks	Exam. Hours	Credits Hour		Course Title	Code No.	Semester
50	1	[1+0]	Compulsory Courses	Plant Cell and Tissue Culture. زراعة الخلايا والأنسجة النباتية.	2201	First
50	1	[1+0]		Isolation and Identification of Natural Products الفصل والتعرف على المواد الطبيعية.	2202	
50	1	[1+0]		Chromatographic Techniques. التقنيات الكروماتوجرافية.	2203	
50	1	[1+0]		Advanced Chromatographic Methods. التقنيات الكروماتوجرافية المتقدمة.	2207	
50	1	[1+0]		Biosynthesis in Medicinal Plants. التصنيع الحيوى بالنباتات الطبية.	2205	Second
50	1	[1+0]		Advanced Phytochemistry. كيمياء النبات المتقدم.	2206	
50	1	[1+0]		Spectroscopy of Natural Products (NMR, UV, MS and IR). الطرق الطيفية والمواد الطبيعية.	2204	
100	2	[2+0]		Application of Spectroscopy and Structure Elucidation. تطبيقات الطرق الطيفية في إستجلاء البنية الكيميائية.	2208	
50	1	[1+0]		Seminar. حلقة دراسية.	2209	
100	2	[2+0]	Elective Courses	Herbal Medicine and Aromatherapy. طب الأعشاب والعلاج بالزيوت الطيارة.	2210	
100	2	[2+0]		Marine Natural Products. المواد الطبيعية بالكائنات البحرية.	2211	
100	2	[2+0]		Biotechnology and Genetic Engineering التكنولوجيا الحيوية والهندسة الوراثية.	2212	
100	2	[2+0]		Drug – Herb interactions التفاعلات الدوائية والأعشاب الطبية	*2213	
		12	Total credit hours required			

*** تم استبدال الجدول بالجدول الصادر بالقرار الوزاري رقم (٤٨٦٩) بتاريخ ٢٠١٤/١١/١٣**

Course Content of Master Degree in Pharmaceutical Sciences [Pharmacognosy]

Code No. & Credit Hours	Course Title and Content
2201 (1+0)	**Plant Cell and Tissue Culture:** **زراعة الخلايا والأنسجة النباتية** The course discuss the facilities and techniques essential for a cell tissue culture laboratory, with emphasis on culture media, stages of micropropagation, callus-organ-cell and protoplast culture.
2202 (1+0)	**Isolation and Identification of Natural Products:** **الفصل والتعرف على المواد الطبيعية** Candidates are introduced to the advanced methods for the isolation of natural products belonging to different chemical classes, as well as to their characterization and identification.
2203 (1+0)	**Chromatographic Techniques:** **التقنيات الكروماتوجرافية** The course deals with the principles underlying the different chromatographic techniques and their application in the qualitative and quantitative analysis as well as in the isolation and purification of natural products.
2204 (1+0)	**Spectroscopy of Natural Products (NMR, UV, MS and IR):** **الطرق الطيفية والمواد الطبيعية** The different spectroscopic methods (UV, IR, NMR and MS) are studied as tools for characterizing natural products and elucidating their structures.
2205 (1+0)	**Biosynthesis in Medicinal Plants:** **التصنيع الحيوى بالنباتات الطبية** Students of this course are introduced to the significance of secondary metabolites in the life of plants, as well as to methods of studying biosynthesis. Biosynthesis of examples originating from sugars, acetate, activated isoprene, amino acids and shikimic acid are studied.
2206 (1+0)	**Advanced Phytochemistry:** **كيمياء النبات المتقدم** Recent advances in the chemistry of natural products are presented. Examples of novel structures discovered in terrestrial plants, bacteria, fungi, lichens and marine organism and their impact on drug discovery are discussed.
2207 (1+0)	**Advanced Chromatographic Methods:** **التقنيات الكروماتوجرافية المتقدمة** Advanced chromatographic techniques applicable for the qualitative and quantitative analysis of phytoconstituents as well as for the isolation of pure compounds are studied.
2208 (2+0)	**Application of Spectroscopy and Structure Elucidation:** **تطبيقات الطرق الطيفية فى إستجلاء البنية الكيميائية** Application of different spectroscopic methods including UV, IR, NMR and MS in the elucidation of structure of compounds is studied with examples from different chemical categories.
2209 (1+0)	**Seminar:** **حلقة دراسية** Seminar of any applicable field of studied topics.
2210 (2+0)	**Herbal Medicine and Aromatherapy:** **طب الأعشاب والعلاج بالزيوت الطيارة** Herbal medicine and aromatherapy considered new approach in complementary medicine so it's deemed of interest to study their history, new technologies, methodology, safety and their applications.
2211 (2+0)	**Marine Natural Products:** **المواد الطبيعية بالكائنات البحرية** The candidate is introduced to ecology of marine organisms as well as hydrographic and climatic factors, marine zones and communities and taxonomy. Examples of bioactive marine organisms are studied chemically and biologically.

2212 **(2+0)**	**Biotechnology and Genetic Engineering:** **التكنولوجيا الحيوية والهندسة الوراثية** The course discuses the impact of biotechnology and genetic engineering in the commercial production of bioactive natural products as well as in drug discovery from nature.
*** 2213** **(2+0)**	***Drug – Herb interaction:** **التفاعلات الدوائية مع الأعشاب الطبية** Drug interactions with medicinal herbs The subject of drugs interactions with medicinal herbs is critical specially for health care providers because most patients taking the type of drugs manufactured in addition to medicinal herbs. These patients often have health risks due to the lack of scientific information about these interactions, which was the goal of this course is to enrich students with sufficient information for them in this matter as best as possible.

*** تم استبدال الجدول بالجدول الصادر بالقرار الوزاري رقم (٤٨٦٩) بتاريخ ٢٠١٤/١١/١٣**

Master Degree in Pharmaceutical Sciences
[Pharmacology and Toxicology]

The candidate studies (5) compulsory courses and chooses (2) elective courses as shown in the following table:

Exam. Marks		Exam. Hours		Credit Hours		Course Title	Code No.	Semester
Practical	Written	Practical	Written					
--	100	--	2	[2+0]	Compulsory Courses	Pharmacometrics. القياسات الفارماكولوجية.	2301	First
--	100	--	2	[2+0]		Toxicometrics. قياسات السموم.	2302	
--	100	--	2	[2+0]		Immuno Pharmacology. علم الأدوية المناعى.	2303	
--	100	--	2	[2+0]		Pathophysiology of Diseases. الفسيولوجيا وفسيولوجيا الأمراض المتقدمة.	2304	Second
100	--	5	--	[0+2]		Experimental Pharmacology. علم الأدوية التجريبى.	2305	
--	50	--	1	[1+0]	Elective Courses	Clinical Pharmacology. علم الأدوية الأكلينيكى.	2306	
--	50	--	1	[1+0]		Drug and Poison Information. معلومات السموم والأدوية.	2307	
--	50	--	1	[1+0]		Pharmacology of Natural Products. فارماكولوجيا المواد الطبيعية.	2308	
				12	Total credit hours required			

Course Content of Master Degree in Pharmaceutical Sciences [Pharmacology and Toxicology]

Code No. & Credit Hours	Course Title and Content
2301 **(2+0)**	**Pharmacometrics:** القياسات الفارماكولوجية 1- Screening and bioassay of antiulcer drugs, anti – inflammatory drugs….. ets. 2- Detection and evaluation of chemically – induced liver injury including: - Hepatic structure and function. - Classification of chemically induced liver injury. - Lipid peroxidation. - Biological antioxidants. - Hepatotoxic agents. - Evaluation of hepatic injury. 3- Screening of bioassay of some drugs acting on the central nervous and cardiovascular systems.
2302 **(2+0)**	**Toxicometrics:** قياسات السموم 1- Qualitative and quantitative assessment of toxicity: 2- Principles and methods of acute and subacute and chronic toxicity: - Genetic toxicity. - Methods in testing for carcinogenicity. - Teratology test methods for laboratory animals. - Methods in behavioral toxicology. - Biochemical methods for neuro toxicological analysis.
2303 **(2+0)**	**Immuno Pharmacology:** علم الأدوية المناعى 1- Introduction to the immune system. 2 - Immunopathology. 3 - Immunostimulation. 4 - Immunosuppression.
2304 **(2+0)**	**Pathophysiology of Diseases:** الفسيولوجيا وفسيولوجيا الأمراض المتقدمة - Etiology and pathophysiology of insomnia, anxiety, psychosomatic diseases, depression, parkinsonism, all types of epilepsy, pain, rheumatic disease, rheumatic arthritis, gout, hypertension, angina pectoris, cardiac arrhythmias, atherosclerosis congestive heart failure bronchial asthma, endocrine imbalance.
2305 **(0+2)**	**Experimental Pharmacology:** علم الأدوية التجريبى **Practical Course:-**Includes hands on application for various techniques in pharmacological research.
2306 **(1+0)**	**Clinical Pharmacology:** علم الأدوية الإكلينيكى Etiology of pathophysiology of cardiovascular central nervous system diseases treatment methodology with an insight on molecular signaling mechanism.

2307 **(1+0)**	**Drug and Poison Information:** **معلومات السموم والأدوية** 1- Drug information center: - Evidence – Based medicine. - Drug information services & activities. - Sources of drug information [1 ry, 2ry, 3ry]. - Systematic approach for answering a drug information request. - Information technology: Application to drug information [Internet, Medline]. - Evaluation of drug literature [1 ry, 2ry, 3ry literatures]. - Evaluation of clinical studies: Study design and presentation of data. - Practical application of biostatistics in evaluating clinical studies. - Types of evaluation & observational studies. - Drug monograph. - Careers in drug information. 2- Poison information center: - Specific approach in poisoned patients. - Diagnosis of poisoning. - Managing poison cases. - Staff precautions in toxicological emergencies.
2308 **(1+0)**	**Pharmacology of Natural Products:** **فارماكولوجيا المواد الطبيعية** 1- Alternative therapies. 2- Pharmacology of natural products. 3- Vitamins of diet. 4- Dietary antioxidants. 5- Food – Drug interactions. 6- Herb –Drug interactions.

Master Degree in Pharmaceutical Sciences

[Microbiology and Immunology]

The candidate studies (6) compulsory courses and chooses (2) elective courses as shown in the following table:

Exam. Marks	Exam. Hours	Credit Hours		Course Title	Code No.	Semester
100	2	[2+0]	Compulsory Courses	Advanced Microbiology (I). ميكروبيولوجيا متقدمة (I).	2401	First
50	1	[1+0]		Immunology (I): Basic Immunology. مناعة (I): أساسيات المناعة.	2402	
100	2	[2+0]		Sterilization and Microbiological Quality Control and Quality Assurance. التعقيم والرقابة الميكروبيولوجية وتأكيد الجودة.	2403	
100	2	[2+0]		Antimicrobial Agents and Microbial Resistance. المضادات الميكروبية والمقاومة الميكروبية.	2404	
50	1	[1+0]		Advanced Microbiology (II). ميكروبيولوجيا متقدمة (II).	2405	Second
100	2	[2+0]		Immunology (II): Immunologicals and Immunological Applications. مناعة (II): المستحضرات المناعية وطرق المناعة وتطبيقاتها.	2406	
50	1	[1+0]	Elective Courses	Advanced Techniques in Microbiological Research. تقنيات متطورة لأبحاث الميكروبيولوجي.	2407	
50	1	[1+0]		Strategies for New Antibiotics and Antiviral Agents. استراتيجيات المضادات الحيوية والمضادات الفيروسية الحديثة.	2408	
50	1	[1+0]		Biotechnology. التكنولوجيا الحيوية.	2409	
50	1	[1+0]		Special Topics in Microbial Pathogenesis and Emerging Infectious Diseases. موضوعات مختارة عن الطرق الميكروبية الممرضة والأمراض المعدية الطارئة.	2410	
		12	Total credit hours required			

Course Content of Master Degree in Pharmaceutical Sciences [Microbiology and Immunology]

Code No. & Credit Hours	Course Title and Content
2401 **(2+0)**	**Advanced Microbiology (I): ميكروبيولوجيا متقدمة (I)** Biochemistry of the bacterial cell, Metabolism and biosynthetic pathways in microorganisms, Macromolecules and molecular genetics.
2402 **(1+0)**	**Immunology (I): Basic Immunology: مناعة (I): أساسيات المناعة** Components of the immune system, mechanisms of humoral and cellular immunity, cells and organs which participate in immunity building, immune system related diseases and disorders (hypersensitivity, auto immune diseases) ,mechanisms for tissues and organ rejection.
2403 **(2+0)**	**Sterilization and Microbiological Quality Control and Quality Assurance:** **التعقيم والرقابة الميكروبيولوجية وتأكيد الجودة** Aseptic techniques, different methods of sterilization of pharmaceutical preparations, validation of the sterilization process, methods for reducing the level of contamination of non-sterile pharmaceutical products, quality control procedures to assure high level of confidence and standardization of the procedures used in quality control.
2404 **(2+0)**	**Antimicrobial Agents and Microbial Resistance:المضادات الميكروبية والمقاومة الميكروبية** Introduction to antimicrobial agents, antibiotics and chemotherapeutic agents, nonantibiotics antimicrobial agents, mode of action, bacterial resistance to antimicrobial agents, mechanisms of resistance to antimicrobial agents.
2405 **(1+0)**	**Advanced Microbiology (II): ميكروبيولوجيا متقدمة(II)** Microbial genetics, gene manipulation, genetic engineering and microbial biotechnology.
2406 **(2+0)**	**Immunology (II): Immunologicals and Immunological Applications:** **مناعة (II): المستحضرات المناعية وطرق المناعة وتطبيقاتها** Molecular immunology, serology in the diagnosis of diseases, therapeutic uses of microbial toxins [vaccines, toxoids, monoclonal antibodies, etc], quality assurance of immunologicals.
2407 **(1+0)**	**Advanced Techniques in Microbiological Research: تقنيات متطورة لابحاث الميكروبيولوجى** Recombinant DNA techniques, molecular cloning, PCR techniques and applications of genome bioinformatics.
2408 **(1+0)**	**Strategies for New Antibiotics and Antiviral Agents:** **استراتيجيات المضادات الحيوية والمضادات الفيروسية الحديثة** Development of resistance to antibiotics and antiviral agents, Problematic bacteria and viruses, new classes of antibiotics and antiviral agents and high throughput systems for screening of new antimicrobial agents.
2409 **(1+0)**	**Biotechnology: التكنولوجيا الحيوية** Biotechnology techniques, applications of biotechnology in food and organic compounds production**.**
2410 **(1+0)**	**Special Topics in Microbial Pathogenesis and Emerging Infectious Diseases:** **موضوعات مختارة عن الطرق الميكروبية الممرضة والأمراض المعدية الطارئة** Recent infectious diseases outbreaks,host-pathogen relathionship, interaction between infectious disease and the human immune system, public health measures in these outbreaks.

*Master Degree in Pharmaceutical Sciences
[Pharmaceutical Organic Chemistry]

The candidate studies (6) compulsory courses and chooses (2) elective courses as shown in the following table:

Exam. Marks	Exam. Hours	Credit Hours		Course Title	Code No.	Semester
100	2	[2+0]	Compulsory Courses	*Pharmaceutical Organic Synthesis. التشييد العضوى الصيدلى .	*2501	First
100	2	[2+0]		*Topics in Pharmaceutical Organic Reactions. موضوعات في التفاعلات العضوية الصيدلية.	*2502	
100	2	[2+0]		*Spectral Identification of Pharmaceutical Organic Compounds. التعرف الطيفي للمركبات العضوية الصيدلية.	*2503	
100	2	[2+0]		Medicinal Chemistry. الكيمياء الطبية.	2504	Second
50	1	[1+0]		*Experimental Pharmaceutical Organic Chemistry. الكيمياء العضوية الصيدلية العملية.	*2505	
50	1	[1+0]		*Nomenclature of Pharmaceutical organic Compounds. التسمية الكيميائية للمركبات العضوية الصيدلية .	*2506	
50	1	[1+0]	Elective Courses	Bioorganic Chemistry. الكيمياء العضوية الحيوية.	2507	
50	1	[1+0]		*Pericyclic Reactions Chemistry (applications in Pharmaceutical Industry). الكيمياء الحول الحلقية وتطبيقاتها في الصناعات الدوائية.	*2508	
50	1	[1+0]		Advanced Heterocyclic Chemistry. الكيمياء الغير متجانسة المتقدمة.	2509	
50	1	[1+0]		*Recent Trends in Pharmaceutical Organic Chemistry. الاتجاهات الحديثة فى الكيمياء العضوية الصيدلية.	*2510	
50	1	[1+0]		Relating Structure to Chemical Reactivity. علاقة التركيب البنائى بالنشاط الكيميائى .	2511	
		12	Total credit hours required			

* تم استبدال الجدول بالجدول بالقرار الوزاري رقم (٢٠٠٤) بتاريخ ٢٠١٣/٨/١

Course Content of Master Degree
in Pharmaceutical Sciences

[Pharmaceutical Organic Chemistry]

Code No. & Credit Hours	Course Title and Content
*2501 (2+0)	**Pharmaceutical Organic Synthesis:** التشييد العضوى الصيدلى A comprehensive course in the synthesis of organic and medicinal compounds using the concept of retrosynthetic analysis and the disconnection approach. The use of synthones and synthetic equivalents, functionilization and functional group interconversions and of protecting groups are illustrated.
*2502 (2+0)	**Topics in Pharmaceutical Organic Reactions:** موضوعات فى التفاعلات العضوية الصيدلية A course in advanced organic chemistry intended for students who have had the standard undergraduate organic and physical chemistry courses .The organization is based on reaction types, so the student can be shown that despite the large number of organic reactions , a relatively few principles suffice to explain nearly all of them. Accordingly, the course is divided into the following reactions / mechanisms: Aliphatic Nucleophilic Substitution, Aromatic Nucleophilic Substitution , Aliphatic Electrophilic Substitution, Aromatic Electrophilic Substitution, Free Radical Substitution, Addition to C-C and C-Hetero multiple bonds, Elimination Reactions, Rearrangements and Oxidations and Reductions.
*2503 (2+0)	**Spectral Identification of Pharmaceutical Organic Compounds:** التعرف الطيفى للمركبات العضوية الصيدلية A comprehensive course in the use of UV, Vis, IR, NMR, ESR and mass spectroscopy in the structural identification and characterization of organic compounds.
2504 (2+0)	**Medicinal Chemistry:** الكيمياء الطبية An introductory course in medicinal chemistry aimed to graduate students involved in making and / or studying compounds of possible biological significance. It includes the study of chemical and stereochemical aspects in drug-receptor interaction, computer- simulated models for drug-receptor complex, enzyme reactivity from an organic perspective, major metabolic pathways / activation leading to mutagenicity. Aspects concerning drug selectivity and discussion of selected recent articles in the field are also included.
*2505 (1+0)	**Experimental Pharmaceutical Organic Chemistry:** الكيمياء العضوية الصيدلية العملية This course illustrates safety procedures and experimental techniques used in the synthesis, isolation, purification and identification of organic compounds. It is intended for graduate students starting their experimental research in organic chemistry.
*2506 (1+0)	**Nomenclature of Pharmaceutical Organic Compounds:** التسمية الكيميانية للمركبات العضوية الصيدلية This course involves the application of the most updated IUPAC rules and other methods for the nomenclature of acyclic, Monocyclic, Fused polycyclic, Bridged and Spiro hydrocarbons and hetero systems.
2507 (1+0)	**Bioorganic Chemistry:** الكيمياء العضوية الحيوية Carbohydrates: Structure, stereochemistry , conformational analysis, chemical reactions and structure determination of carbohydrates Proteins: Classification, stereochemistry, synthesis, chemical and some biochemical reactions of amino acids / secondary and tertiary structure of peptides / protein quaternary structure. Lipids: Structure, stereochemistry, biosynthesis of fatty acids. phospholipids, prostaglandins, terpenes , steroids and carotenoids * تم استبدال الجدول بالجدول بالقرار الوزاري رقم (٢٠٠٤) بتاريخ ٢٠١٣/٨/١

*2508 (1+0)	**Pericyclic Reactions Chemistry (applications in Pharmaceutical Industry):** **الكيمياء الحول الحلقية وتطبيقاتها فى الصناعات الدوائية** Study of concerted reactions which obey principles of conservation of orbital symmetry. The course studies three types of pericyclic reactions; Electrocyclic Reactions, Cycloaddition Reactions and Sigmatropic Rearrangements. Modes of transition state structures leading to different stereochemical outcome are discussed. A brief introduction in Huckel MO theory is presented at the beginning of this course to familiarize the student with the subject.
2509 (1+0)	**Advanced Heterocyclic Chemistry:** **الكيمياء الغير متجانسة المتقدمة** The aim of this course is to present a unified account of fundamental heterocyclic chemistry on an advanced level in order to give better and broader understanding of this important part of chemistry. Emphasis is placed on the correlation between the chemical reactivity of various heterocyclic ring systems. Synthesis of heterocyclic compounds using the disconnection approach and the biological significance of some heterocyclic systems are included.
*2510 (1+0)	**Recent Trends in Pharmaceutical Organic Chemistry:** **الإتجاهات الحديثة فى الكيمياء العضوية الصيدلية** The course aims at giving the students recent techniques in Pharmaceutical Organic Chemistry including the use of green chemistry as well as the new methodology in the synthesis of pharmaceutical products (microwave assisted synthesis, flow chemistry, biocatalysis, enzyme-mediated assisted synthesis or C-H activation).
2511 (1+0)	**Relating structure to chemical reactivity:** **علاقة التركيب البنائى بالنشاط الكيميائى** A specific course on relating noncovalent interactions to reactivity, regio- and stereoselectivity of a reaction. Subjects such as steric effect, Neighbouring group participation, solvent effect and complex formation are discussed with illustrative examples.

*** تم استبدال الجدول بالجدول بالقرار الوزاري رقم (٢٠٠٤) بتاريخ ٢٠١٣/٨/١**

Master Degree in Pharmaceutical Sciences

[Analytical Chemistry]

The candidate studies (6) compulsory courses and chooses (2) elective courses as shown in the following table:

Exam. Marks	Exam. Hours	Credit Hours		Course Title	Code No.	Semester
100	2	[2+0]	Compulsory Courses	Advanced Methods of Instrumental Analysis. طرائق التحليل الآلى المتقدمة.	2601	First
100	2	[2+0]		Quality Control in Pharmaceutical Industry. رقابة الجودة فى الصناعة الصيدلية.	2602	
50	1	[1+0]		Biomathematics (I). الرياضيات بالتطبيقات (I).	2603	
100	2	[2+0]		Separation Analysis Techniques. طرائق الفصل التحليلية.	2604	Second
100	2	[2+0]		Stability Indicating Methods of Analysis. طرائق تحليلية ثباتية.	2605	
50	1	[1+0]		Biomathematics (II). الرياضيات بالتطبيقات(II).	2606	
50	1	[1+0]	Elective Courses	Functional Groups Analysis. التحليل من خلال المجموعات الوظيفية للمركبات.	2607	
50	1	[1+0]		Thermal Analysis. التحليل الحرارى.	2608	
50	1	[1+0]		Environmental Analysis. التحليل البيئى.	2609	
		12	Total credit hours required			

Course Content of Master Degree in Pharmaceutical Sciences

[Analytical Chemistry]

Code No. & Credit Hours	Course Title and Content
2601 **(2+0)**	**Advanced Methods of Instrumental Analysis:** **طرائق التحليل الآلى المتقدمة** This course includes the study of molecular absorption and emission, visible – ultraviolet, infrared, atomic absorption and emission, nuclear magnetic resonance principles, instruments, recent trends and analytical applications of these methods and electrochemical methods of analysis.
2602 **(2+0)**	**Quality Control in Pharmaceutical Industry:** **رقابة الجودة فى الصناعة الصيدلية** This course includes total quality management, reference standard, development, optimization and validation of analytical methods and good analytical practice [GAP] and good laboratory practice [GLP].
2603 **(1+0)**	**Biomathematics (I):** **الرياضيات بالتطبيقات(I)** Determination of matrices – numerical integrations – curve filling approximation.
2604 **(2+0)**	**Separation Analysis Techniques:** **طرائق الفصل التحليلية** This course includes different chromatographic methods of analysis; gas chromatography high performance liquid chromatography and electrophoresis especially principles – instruments and applications.
2605 **(2+0)**	**Stability Indicating Methods of Analysis:** **طرائق تحليلية ثباتية** This course includes selective determination of intact drug in the presence of its degradation products based on extraction techniques chromatographic and spectroscopic techniques.
2606 **(1+0)**	**Biomathematics (II):** **الرياضيات بالتطبيقات(II)** Energy level and molecular orbitals spectrophotometric analysis pharmacokinetics [dilution problems].
2607 **(1+0)**	**Functional Groups Analysis:** **التحليل من خلال المجموعات الوظيفية للمركبات** This course includes direct and indirect determination of pharmaceutical compounds through preliminary reactions based on their function groups.
2608 **(1+0)**	**Thermal Analysis:** **التحليل الحرارى** Study of thermal techniques: Thermo gravity, derivative thermo gravity, differential thermal analysis, differential scanning calometry, heating and cooling curves, dilatometry, evolved gas detection and analysis, ..etc, definitions, instruments, factors affecting curves and application.
2609 **(1+0)**	**Environmental Analysis:** **التحليل البيئى** Air pollution: Air pollutants, sampling, monitoring and methods of analysis [Sox, Nox, Co, Pm, soots, metal ions]. Water pollution: Water pollutants, water quality parameters [TDS, TSS, DO, BOD, COD, PH, temp., sediments, hardness, metal ions, oil grease, anions, …… etc] soil analysis.

Master Degree in Pharmaceutical Sciences

[Biochemistry]

The candidate studies (6) compulsory courses and chooses (1) elective courses as shown in the following table:

Exam. Marks	Exam. Hours	Credits Hour		Course Title	Code No.	Semester
150	3	[3+0]	Compulsory Courses	Biochemistry (I). كيمياء حيوية (I).	2701	First
50	1	[1+0]		Biochemistry Laboratory Techniques. التقنيات المعملية للكيمياء الحيوية	2702	
100	2	[2+0]		Molecular Biology. البيولوجيا الجزيئية.	2703	
150	3	[3+0]		Biochemistry (II). كيمياء حيوية (II).	2704	Second
50	--	[1+0]		Seminar. حلقة دراسية.	2705	
50	1	[1+0]		Bioorganic Chemistry. الكيمياء العضوية الحيوية.	2507	
50	1	[1+0]	Elective Courses	Nutrition in Disease Prevention and Cure. التغذية فى منع المرض والشفاء منه.	2706	
50	1	[1+0]		Interaction of Nutrients and Drugs on Biochemical Laboratory Data. تفاعلات الأغذية والأدوية على نتائج التحاليل البيوكيميائية.	2707	
		12	Total credit hours required			

Course Content of Master Degree

in Pharmaceutical Sciences [Biochemistry]

Code No.& Credit Hours	Course Title and Content
2701 (3+0)	**Biochemistry (I):** **كيمياء حيوية (I)** - Chemistry of biomolecules and how this relates to cell structure. - Biomembranes: the structure and function of biological membranes with emphasis on membrane protein - Proteins and proteomics: protein structure and chemistry include structural motifs; ligand binding, conformational changes, chemical modification; protein folding, structure prediction by molecular modeling, post- translational modifications; protein-protein interaction and metalloproteins.. - Enzymology: The structure, mechanism and biological interactions of enzymes with regard to chemical principles of kinetics and reaction. - Micronutrients: Vitamins and minerals.
2702 (1+0)	**Biochemistry Laboratory Techniques:** **التقنيات المعملية للكيمياء الحيوية** Modern biochemical techniques for analysis of different biochemical molecules. Laboratory safety, centrifugation, data analysis, use of radioisotopes, bioinformatics and a selection of protein characterization techniques, chromatography, gel electrophoresis, ELISA techniques and mass spectrometry.
2703 (2+0)	**Molecular Biology:** **البيولوجيا الجزيئية** Chemical structure and physical characterization of nucleic acids, DNA toplogy, the synthesis of nucleotides, DNA, RNA and proteins. Nucleic acid-protein interaction as related to transcription and chromosome structure. Control mechanisms of transcription and gene expression . Molecular biology techniques (Recombinant DNA and cloning of DNA molecules and their applications.
2704 (3+0)	**Biochemisty (II):** **كيمياء حيوية (II)** - Energy metabolism. - Regulation of metabolism and signal transduction the structure, function, compartmentation of selected metabolic pathways in microbes, plants and animals (carbohydrate metabolism, lipid and steroidogenesis (biosynthesis) and nitrogen metabolism. - Signal transduction pathways from the membrane to nucleus and structure and function of protein kinases and protein phosphatases. - Hormones: actions and their metabolic roles. - Metabolism of individual tissues. - Cellular mechanisms of metabolic diseases.
2507 (1+0)	**Bioorganic Chemistry:** **الكيمياء العضوية الحيوية** Carbohydrates: Structure ,stereochemistry , conformational analysis, chemical reactions and structure determination of carbohydrates Proteins: Classification, stereochemistry, synthesis, chemical and some biochemical reactions of amino acids / secondary and tertiary structure of peptides / protein quaternary structure. Lipids: Structure, stereochemistry, biosynthesis of fatty acids. phospholipids, prostaglandins, terpenes , steroids and carotenoids .
2706 (1+0)	**Nutrition in Disease Prevention and Cure:** **التغذية فى منع المرض والشفاء منه**
2705 (1+0)	**Seminar:** **حلقة دراسية** Special topics of interest presented by students with free discussion.
2707 (1+0)	**Interaction of Nutrients and Drugs on Biochemical Laboratory Data :** **تفاعلات الأغذية والأدوية على نتائج التحاليل البيوكيميائية**

Master Degree in Pharmaceutical Sciences

[Pharmaceutical Chemistry]

The candidate studies (6) compulsory courses and chooses (1) elective course as shown in the following table:

Exam. Marks	Exam. Hours	Credit Hours		Course Title	Code No.	Semester
100	2	[2+0]	Compulsory Courses	Drug Design (I). تصميم الدواء(I).	2801	First
100	2	[2+0]		Spectroscopic and Chromatographic Studies in Pharmaceutical Chemistry (I). دراسات طيفية وكروماتوجرافيا في الكيمياء الصيدلية (I).	2802	
100	2	[2+0]		Advances Synthesis of Drugs. طرق مستحدثة فى تشييد الأدوية.	2803	
50	1	[1+0]		Drug Design (II). تصميم الدواء(II).	2804	Second
50	1	[1+0]		Spectroscopic and Chromatographic Studies in Pharmaceutical Chemistry (II). دراسات طيفية وكروماتوجرافيا في الكيمياء الصيدلية (II).	2805	
100	2	[2+0]		Advanced Topics in Pharmaceutical Medicinal Chemistry. موضوعات متقدمة فى الكيمياء الصيدلية الطبية.	2806	
100	2	[2+0]	Elective Courses	Toxicological Chemistry. كيمياء سموم.	2807	
100	2	[2+0]		Biopharmaceutical Reaction Mechanisms. ديناميكية التفاعلات الحيوية الصيدلية.	2808	
100	2	[2+0]		Modern Techniques in Pharmaceutical Analysis. تقنيات حديثة فى التحليل الصيدلى.	2809	
		12	Total credit hours required			

Course Content of Master Degree
in Pharmaceutical Sciences[Pharmaceutical Chemistry]

Code No. & Credit Hours	Course Title and Content
2801 **(2+0)**	**Drug Design (I):** **تصميم الدواء (I)** Quantitative approaches to structure activity relationship, molecular modeling and computer aided drug design, protein crystallography and drug discovery, combinatorial chemistry, structure activity relationship by NMR and MS.
2802 **(2+0)**	**Spectroscopic and Chromatographic Studies in Pharmaceutical Chemistry (I):** **دراسات طيفية وكروماتوجرافيا فى الكيمياء الصيدلية(I)** The course involves the utility of spectroscopy and chromatography for the elucidation of chemical structure, separation and quantitation of drugs. Spectroscopy comprises UV-visible, infrared, and mean, infrared absorption, also Raman scattering. are also included.
2803 **(2+0)**	**Advances Synthesis of Drugs:** **طرق مستحدثة فى تشييد الأدوية** Study of new synthetic methods for the preparation of certain examples of drugs belonging to different medicinal classes as: Antibacterial, anti-inflammatory selective cyclogenase-II inhibitors, non sedating antihistaminic, antidepressant, Antiasthmatic, triptans for migrane, atorvastatin calcium, Antithrombotics. The synthetic methods includes: Microwave synthesis, biotechnological methods and combinational chemistry, …. etc.
2804 **(1+0)**	**Drug Design (II):** **تصميم الدواء(II)** The design of peptidomimetics and enzyme inhibitors, the design of prodrug and bioprecursors, macromolecular carriers for drug targeting, the chemical and physicochemical solution to formulation problems.
2805 **(1+0)**	**Spectroscopic and Chromatographic Studies in Pharmaceutical Chemistry (II):** **دراسات طيفية وكروماتوجرافيا فى الكيمياء الصيدلية (II)** The course involves the utility of spectroscopy and chromatography for the elucidation of chemical structure, separation and quantitation of drugs. Fluorimetry, 1 HNMR, 13 CNMR and mass spectrometry are also included.
2806 **(2+0)**	**Advanced Topics in Pharmaceutical Medicinal Chemistry:** **موضوعات متقدمة فى الكيمياء الصيدلية الطبية** This course will be designed by selecting advanced topics in pharmaceutical medicinal chemistry for example alteration of drug metabolism through structural modifications. Modernization in the design of synthetic pathways of drugs, solid phase as a useful method in drug synthesis, …….etc.
2807 **(2+0)**	**Toxicological Chemistry:** **كيمياء سموم** Selective toxicity study, Comparative distribution, biochemistry, cytology, stereochemistry, Selective toxicity examples; Cancer chemotherapy, antibiotics, sulfonamides, anti-tubercular….etc.
2808 **(2+0)**	**Biopharmaceutical Reaction Mechanisms:** **ديناميكية التفاعلات الحيوية الصيدلية** The aim of this course is to relate chemical phenomena with biological activity. It includes: the study of chemical aspects in drug, receptor interaction, major metabolic pathways and activation of the drugs [with illustrative examples]. Coenzyme catalysis and some biochemical reactions of amino acids, with discussion of selected recent articles in the field , competitive, non-competitive, and uncompetitive and other types of enzyme inactivators with illustrative examples.

2809 **(2+0)**	**Modern Techniques in Pharmaceutical Analysis:** **تقنيات حديثة فى التحليل الصيدلى** The course includes modern techniques such as electrophoresis, near-infrared absorption, high performance liquid chromatography in the analysis of drugs in their either as single compartment (Pharmaceutical formulation) or in combination with other drug. The course aims to study in the presence of exepients, degradates or metabolites

Master Degree in Pharmaceutical Sciences

[Clinical Pharmacy]

The candidate studies (4) compulsory courses and chooses (1) elective course as shown in the following table:

Exam. Marks	Exam. Hours	Credits Hour		Course Title	Code No.	Semester
150	3	[3+0]	Compulsory Courses	Pharmacotherapeutics (I). علاجيات صيدلية (I).	2901	First
200	3	[4+0]		Clinical Pharmacokinetics. حركية دواء إكلينيكية.	2902	
150	3	[3+0]		Pharmacotherapeutics (II). علاجيات صيدلية (II).	2903	Second
100	2	[2+0]		Pharmaceutical Care. رعاية صيدلية.	2904	
100	2	[2+0]	Elective Courses	Pharmacy Practice. ممارسة صيدلية.	2905	
100	2	[2+0]		Bases of Therapeutic Literature Evaluation and Biostatistics. مبادئ تقييم المؤلفات العلاجية وعلوم الإحصاء الحيوية.	2906	
		14	Total credit hours required			

Course Content of Master Degree
in Pharmaceutical Sciences [Clinical Pharmacy]

Code No. & Credit Hours	Course Title and Content
2901 **(3+0)**	**Pharmacotherapeutics (I):** **علاجيات صيدلية(I)** Introduces different antibiotics, antifungal and antiviral therapy. Case discussion incorporated for various disease states, with emphasis on drug interactions, adverse drug reactions, dosing monitoring and patient counseling. It also provides fundamental understanding of gastrointestinal tract and pathophysiology of different diseases. Topics include conditions such as peptic ulcer, irritable bowel syndrome, gastrointestinal reflux disease and drug induce peptic ulcers will be discussed through the course with emphasis on therapeutic option and significant drug interaction and patient counseling. Diseases of upper and lower respiratory system will be also discussed and studied in this class the class will discuss the cases of cardiology 1: ke hypertension angina.
2902 **(4+0)**	**Clinical Pharmacokinetics:** **حركية دواء إكلينيكية** The class will deal with introduction to advanced concepts in clinical pharmacokinetics with emphasis on special patient populations and specific drugs. Drug dosing to renal impaired patients and patients with live problems will be of interest. Mechanisms and kinetics of drug clearance through liver enzymes and cytochrom P450 system will be discussed.
2903 **(3+0)**	**Pharmacotherapeutics (II):** **علاجيات صيدلية(II)** Topics include conditions such as diabetes mellitus; hyperthyroidism and hypothyroidism will be discussed in details with emphasis on therapeutic choices, drug interactions, therapeutic monitoring and patient counseling. The class will also provide an understanding of basic principles of oncology. Topics such as breast cancer, leukemia and liver cancer will be discussed with emphasis on therapeutic choices, side effects, therapeutic monitoring, drug interaction and patient counseling. Nutritional support and psychological state of the cancer patients will be also introduced in brief. Nephrology and kidney diseases will be also of interest in this class. Cases such as acute and chronic glomerulonephritis, urinary tract infections, drug induced renal disorders, acute and chronic renal failure and drug dosing in renally impaired patients will be discussed and studied in this class.
2904 **(2+0)**	**Pharmaceutical Care:** **رعاية صيدلية** This course introduces students to the philosophy of practice, professionalism, patient adherence, patient counseling, patient oriented pharmaceutical care, patient interview, review of medical records, assessment of compliance, drug therapy assessment skills, and monitoring and modifying the pharmaceutical care plan with the goal of assuring the improvement of patient quality of life.
2905 **(2+0)**	**Pharmacy Practice:** **ممارسة صيدلية** Pharmacy practice I provides fundamental understanding of functions, responsibilities, and outcomes of pharmacy practice in modern health care system. Introducing fundamental concepts of pharmaceutical care and patient counseling with emphasis on communication skills, patient interview and medical history documentation. The course will also give special interest for special patient groups [geriatric, pediatric, ….etc] The course also introduces the basic techniques of physical assessment. Student will apply their medical information on several patient eases and therapeutic plans through problem based learning technique.

Faculty Facilities

بيان بالأجهزة بكلية الصيدلة

اولاً : المعمل المركزى:-

كليـــــــــة الصيدلـــــــــة	وحدة المعمل المركزى	الفنى المسئول	أسم الجهاز	الوظيفة
	معمل د/ وليد الكيالى	أ/ عمر رجب	Cooling Centrifuge	جهاز طرد المركزى بالتبريد
			Dissolution	أختبارات الثبات والذوبان
			Spectrophotometer	القياس الكمى والكيفى للمواد من خلال إمتصاص الضوء
			Spectrofluorimeter	القياس الكمى والكيفى للمواد بطرق القياس اللصفى
	(معمل القياسات الكيميائية والفيزيائية)	أ/ مرتضى بالله مصطفى	جهاز تقطير عالى الكفائه	جهاز تقطير المياه عالية النقاء
			DSC	جهاز المسح التفاضلى الحرارى
			Spectrophotometer	القياس الكمى والكيفى للمواد من خلال إمتصاص الضوء
			HPLC - FL	كروماتوغرافيا سائلة فائق الأداء
			Gas Chromatography	كروماتوجرافيا الغاز
			Zeta Sizer	قياس حجم وشحنة الجزيئات
			TLC	كروماتوجرافيا الطبقات الرقيقة
			Cooling Centrifuge	جهاز طرد المركزى بالتبريد
			HPLC - UV	كروماتوغرافيا سائلة فائق الأداء
	(معمل البيولوجيا الجزيئية)	أ/خان محمد طلعت	Spectrofluorimeter	القياس الكمى والكيفى للمواد بطرق القياس اللصفى
			HPLC - UV	كروماتوغرافيا سائلة فائق الأداء
			Real Time PCR	تفاعل البوليمريز التتابعى

ثانياً: مركز البحوث التطبيقية (وحدة ذات طابع خاص):

م	أسم المعمل	أسم الجهاز	وظيفة الجهاز	Contact Person
١	معمل رقم (١)	جهاز HPLC	للتحليل كروماتوجرافي لفصل المركبات	أخصائي / أحمد
٢	معمل رقم (١)	جهاز HPLC	للتحليل كروماتوجرافي لفصل المركبات	أخصائي/ مني
٣	معمل رقم (١)	جهاز HPLC	للتحليل كروماتوجرافي لفصل المركبات	بيطرية / يارا
٤	معمل رقم (١)	جهاز U.V System	قياس الطول الموجي	صيدلانية /إيمان
٥	معمل رقم (١)	جهاز تبخير الأنابيب	لتركيز العينات	---
٦	معمل رقم (٢)	جهاز HPLC	للتحليل كروماتوجرافي لفصل المركبات	أخصائي/ هاني
٧	معمل الماس	جهاز LC-MS/MS ووتر	للتحليل كروماتوجرافي لفصل المركبات	أخصائي/ إسلام
٨	معمل الماس	جهاز LC-MS/MS أجيتك	للتحليل كروماتوجرافي لفصل المركبات	أخصائي/ علا
٩	غرفة تحضير العينات	جهاز ديب فرز -86^{O}	لحفظ العينات البلازما	---

ثالثاً : مركز التكنولوجيا الحيوية (وحدة ذات طابع خاص):

اسم المعمل	اسم الجهاز	وظيفة الجهاز	Contact Person
مركز التكنولوجيا الحيوية	Ultarcentrifuge	فصل مع التبريد	أ.اشرف عطية حسن
مركز التكنولوجيا الحيوية	HPLC	فصل كروماتوجرافي	أ.اشرف عطية حسن
مركز التكنولوجيا الحيوية	Incubator Shaker	حضانة يهزاز	أ.اشرف عطية حسن
مركز التكنولوجيا الحيوية	Fermenter	جهاز تخمير	أ.اشرف عطية حسن

قاعات الدرس والمعامل

يتوافر بالكلية مدرجان مجهزان بأحدث شاشات

العرض لتقديم الدروس بها لطلاب الدراسات العليا.
ذلك بالإضافة إلى المعامل المتخصصة بالأقسام العلمية
المختلفة لخدمة العملية التعليمية وأخرى للبحث العلمى.

المعمل المركزى

يحتوى على العديد من الأجهزة الحديثة لخدمة طلاب
الدراسات العليا والبحث العلمي من داخل وخارج الكلية.

Zetasizer

T L C Scanner

Elemental Analyzer

Image AnalyzerUV / Vis

Spectrophotometer

Humidity Chamber

HPLC

Spectrofluorimeter

Cooling Centrifuge

D S C

Homogenizer

G C

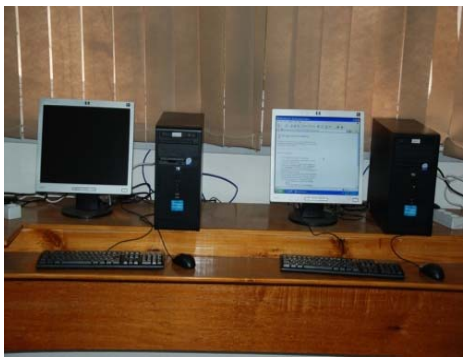
المكتبة

أنشأت المكتبة عام ١٩٥٥ و تبلغ مساحتها ٢٥٠ متر مربع تقريباً وبها ٣ قاعات واحدة خاصة بأعضاء هيئة التدريس وأخرى للطلاب والثالثة للدوريات العلمية. تحتوى المكتبة على عدد ١١٢٤٤ كتاباً فى العلوم الصيدلية و٢٥٦١ رسالة ماجستير ودكتوراه و١٢٥ دورية علمية فى التخصصات المختلفة. والمكتبة مجهزة بأربعة أجهزة حاسب آلى للبحث عن الكتب وتقديم خدمة بحث سريعة عن طريق الإنترنت فائق السرعةDSL. ذلك و يستفيد أيضاً أعضاء هيئة التدريس وطلاب الكلية بخدمات الإطلاع و الاستعارة من **المكتبة المركزية** بجامعة القاهرة و التى تم تزويدها بأحدث التقنيات الفنية لعمليات الفهرسة و النشر الالكتروني و الطباعة.

معمل التردد النووي المغناطيسي NMR

يقوم جهاز التردد النووي المغناطيسي الموجود بالمعمل بتحليل المركبات العضوية المخلقة أو من أصل طبيعي مما يساعد طلاب الدراسات العليا و البحث العلمي على استجلاء تلك المركبات واكتشاف الحديث منها في مجال البحوث الطبية والتطبيقية.

معمل النمذجة الجزيئية



تم إنشاء معمل النمذجة الجزيئية في ديسمبر عام ٢٠٠٨ وتم تزويد المعمل بثلاثةأجهزة كمبيوتر وحصلت الكلية على برنامج MOE بترخيص من الشركة المنتجة. تم تدريب أعضاء هيئة التدريس والهيئة المعاونة بقسم الكيمياء الصيدلية على استخدام البرنامج الذى يفيد الدراسة الخاصة بتصميم الدواء وكذلك الأبحاث العلمية المختلفة التي تعنى بتصميم وتشييد الدواء مما يتيح تطوراً علميا متوافقا مع أخر الأبحاث المنشورة في هذا المجال.

محطة تجارب النباتات الطبية

أنشئت فى عام ١٩٤٨ وتتبع قسم العقاقير وهى تمد القسم بما يحتاجه من النباتات الطبية اللازمة للدراسة المعملية لطلبة الدراسات العليا بزراعة النباتات الطبية والتجارب الخاصة بالأبحاث العلمية.

وحدة زراعة الأنسجة النباتية

أنشأت عام ٢٠٠٦ لإجراء أبحاث تطبيقية عن زراعة أنسجة النباتات الطبية والعطرية بهدف زيادة الموادالفعالة. و الوحدة تحتوى على أجهزة حديثةالتقنية لخدمة الباحثين في هذا المجال.

مركز الكمبيوتر

تم إفتتاح المركز عام ١٩٨٧كوحدة ذات طابع خاص و قد روعى فى تجهيزهاشتماله على مجموعة من أنظمة الحاسب الآلى المختلفة و يهدف المركز إلى استخدام الكمبيوتر كقاعدة بيانات ومعلومات وإعداد برامج وكذلك فى الاتصالات المختلفة. و يتبع المركز معامل مخصصة لتدريب و منح شهادة الرخصة الدوليةلقيادة الحاسب الآلي و قاعتان للإنترنت.

مركز البحوث التطبيقية و الدراسات المتقدمة

أنشأ المركز عام ١٩٨٩ كوحدة ذات طابع خاص على أن يكون حلقة وصل بين الدراسات الأكاديمية و صناعة الدواء تسهم فى تقديم حلول تطبيقية للمشاكل التى تعترضهذه الصناعة لتحقيق الجودة المطلوبة و زيادة قدرتها التنافسية.

مركز التكنولوجيا الحيوية

أنشأ المركز عام ١٩٩٩ و هو وحدة ذات طابع يتم به القيام ببحوث متقدمة فى مجالات العلوم الصيدلية والتقنية الحيوية كما يقوم المركز بالاشتراك فى المشاريع البحثية وتوفير خدمات استشارية ومعملية متقدمة وكذلك دورات تدريبية للباحثين من الداخل و الخارج فى مجالات التخصص.

آلية تلقى شكاوى طلاب الدراسات العليا

١- يقوم طالب الدراسات العليا بتحرير شكواه على نموذج الشكاوى الموجود فى إدارة الدراسات العليا ، ثم يقوم بوضعة فى صندوق شكاوى الدراسات العليا الموجود فى القسم الموجه إليه الشكوى.

٢- يقوم مندوب لجنة الشكاوى فى كل قسم علمى بفتح الصندوق مرة كل اسبوعين فى وجود مدير إدارة الدراسات العليا مع احد طلبه الدراسات العليا المسجلين فى ذات القسم.

٣- يقوم مندوب لجنة الشكاوى بالتعاون مع الأستاذ الدكتور منسق الدبلوم أو الماجستير بفحص الشكوى والرد عليها فى المكان المخصص لذلك فى نموذج الشكوى.

٤- يوجه الرد للطالب شخصياً فى حالة وجود اسمه على الشكوى.

٥- تؤخذ الشكوى للاسترشاد فى التقويم المستمر.