

الدبلوم المهني في

الكيمياء الحيوية و التحليل الإكلينيكي

(اللائحة الداخلية)

بنظام الساعات المعتمدة

٢٠١٦

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2016

"الدبلوم المهني في الكيمياء الحيوية والتحليل الإكلينيكي"
Professional Diploma in Biochemistry and Clinical Analysis

اللائحة الدراسية

مادة (١): أهداف البرنامج

يهدف هذا البرنامج إلى إعداد كوادر رائدة تتميز بمهنية عالية في المجال التطبيقي للكيمياء الحيوية والتحليل الإكلينيكية، وإلى إكساب الدارسين قدرات علمية ومهارات عملية تمكنهم من إجراء القياسات المعملية التشخيصية والمشاركة الفاعلة في تقديم الخدمات للمرضى من خلال دورهم في المنظومة الصحية في المجتمع.

مادة (٢): الشهادة العلمية

يمنح مجلس جامعة طنطا بناء على طلب مجلس كلية الصيدلة شهادة "الدبلوم المهني في الكيمياء الحيوية والتحليل الإكلينيكي".

مادة (٣): مدة ولغة الدراسة

مدة الدراسة سنة واحدة تشتمل على فصلين دراسيين كل منهما ١٧ أسبوعا شاملة الامتحانات، وذلك بواقع ١٤ ساعة معتمدة أسبوعيا لكل فصل دراسي، ولغة الدراسة بالبرنامج الإنجليزية.

مادة (٤): نظام الدراسة

تكون الدراسة بنظام الساعات المعتمدة وتكون الساعة المعتمدة هي أساس تحديد العبء الدراسي للطالب في كل فصل دراسي. والساعة المعتمدة تعادل محاضرة نظرية مدتها ساعة واحدة في الأسبوع أو تدريبات معملية أو تطبيقية مدتها ساعتان أو ثلاثة في الأسبوع أو فترة تدريبات إكلينيكية ميدانية مدتها ثلاثة أو أربعة ساعات في الأسبوع طوال الفصل الدراسي.

مادة (٥): مواعيد التقدم للتحاق بالبرنامج

يتم فتح باب التقدم للدبلوم في أغسطس من كل عام، وتحدد مواعيد الامتحانات بناء على اقتراح اللجنة التنفيذية وقرار مجلس الكلية واعتماد مجلس الجامعة.

مادة (٦): الشروط العامة للقبول والفقد

- يشترط لفقد الطالب في "الدبلوم المهني في الكيمياء الحيوية والتحليل الإكلينيكي" أن يكون حاصلا على البكالوريوس في الصيدلة أو ما يعادلها من إحدى الجامعات داخل جمهورية مصر العربية أو خارجها أو أي معهد علمي آخر معترف به من المجلس الأعلى للجامعات، ويجوز قيد الطلاب الحاصلين على درجة البكالوريوس في الطب والجراحة، أو درجة



- البكالوريوس في العلوم الطبية البيطرية، أو درجة البكالوريوس في العلوم (تخصص الكيمياء الحيوية) من إحدى الجامعات داخل جمهورية مصر العربية أو خارجها.
- يتم قيد الطالب بعد استيفاء المتطلبات العامة الآتية:
١. شهادة المؤهل الدراسي
 ٢. شهادة بالمقررات الدراسية التي درسها الطالب و تقديراته بمرحلة البكالوريوس
 ٣. شهادة الميلاد أو مستخرج رسمي منها
 ٤. موافقة جهة العمل على دراسة الطالب إذا كان من العاملين
 ٥. صورة من الرقم القومي
 ٦. سداد الرسوم الدراسية ومقابل الخدمات التعليمية
- تطبيق القوانين والقواعد المنظمة لقبول وقيد الطلاب الوافدين بالجامعات المصرية طبقا لقانون تنظيم الجامعات.

مادة (٧): إيقاف القيد

يكون إيقاف القيد وفقا لأحكام قانون تنظيم الجامعات ولائحته التنفيذية وطبقا لقرارات مجلس الجامعة المنظمة للعمل في هذا الشأن.

مادة (٨): إلغاء القيد

يقوم مجلس الكلية بإلغاء قيد الطالب بناء على موافقة اللجنة التنفيذية في الحالات الآتية:

١. إذا لم يتم سداد الرسوم الدراسية أو مقابل تسجيل المقررات.
٢. إذا تقدم الطالب بطلب لشطب قيده.
٣. إذا انقطع الطالب عن الدراسة بدون عذر مقبول لمدة عامين متتاليين.

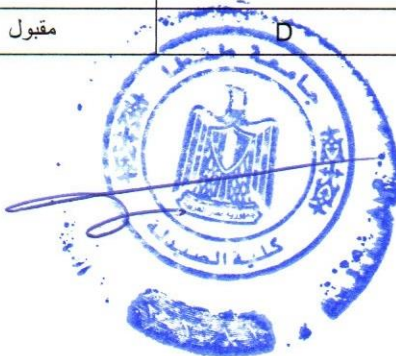
مادة (٩): إعادة القيد

إذا تم إلغاء قيد الطالب لأحد الأسباب المذكورة في المادة (٨) باللائحة، يجوز للجنة العليا ومجلس الجامعة بناء على اقتراح اللجنة التنفيذية وموافقة مجلس الكلية الموافقة على إعادة القيد.

مادة (١٠): الامتحانات و نظام التقييم

- يشترط لدخول الطالب الامتحان أن يكون مستوفيا نسبة حضور لا تقل عن ٧٥٪ من الساعات المخصصة للمقرر.
- يشترط لنجاح الطالب في أي مقرر حضور كافة الاختبارات المكونة للمقرر وأن يحصل على ٦٠٪ على الأقل من إجمالي الدرجة المخصصة لهذا المقرر.
- يوضح الجدول التالي حساب التقديرات للمقرر الدراسي والعلاقة بين التقدير العام والمعدل التراكمي CGPA:

حساب التقديرات للمقرر الدراسي			
التقدير		النسبة المئوية لدرجات المقرر	عدد النقاط
ممتاز	A ⁺	أكبر من أو يساوي ٩٠ ٪	٥
	A	٨٥ لأقل من ٩٠ ٪	٤,٥ إلى أقل من ٥
جيد جدا	B ⁺	٨٠ لأقل من ٨٥ ٪	٤ إلى أقل من ٤,٥
	B	٧٥ لأقل من ٨٠ ٪	٣,٥ إلى أقل من ٤
جيد	C ⁺	٧٠ لأقل من ٧٥ ٪	٣ إلى أقل من ٣,٥
	C	٦٥ لأقل من ٧٠ ٪	٢,٥ إلى أقل من ٣
مقبول	D	٦٠ لأقل من ٦٥ ٪	٢ إلى أقل من ٢,٥



أقل من ٢	أقل من ٦٠٪	F	راسب
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جدول العلاقة بين التقدير العام والمعدل التراكمي CGPA			
التقدير	الرمز	CGPA	النسبة المئوية للمجموع التراكمي
ممتاز	A ⁺	٥	أكبر من أو يساوي ٩٠ ٪
	A	٤,٥ - > ٥	٨٥ لأقل من ٩٠ ٪
جيد جدا	B ⁺	٤ - > ٤,٥	٨٠ لأقل من ٨٥ ٪
	B	٣,٥ - > ٤	٧٥ لأقل من ٨٠ ٪
جيد	C ⁺	٣ - > ٣,٥	٧٠ لأقل من ٧٥ ٪
	C	٢,٥ - > ٣	٦٥ لأقل من ٧٠ ٪
مقبول	D	٢ - > ٢,٥	٦٠ لأقل من ٦٥ ٪

- يتم حساب مجموع نقاط المقرر على أساس حاصل ضرب عدد النقاط التي يحصل عليها الطالب في عدد الساعات المعتمدة للمقرر مقسوما على عدد ساعات المقرر وذلك لأقرب رقمين عشريين.

- يمثل متوسط نقاط الدرجات GPA للفصل الدراسي جميع المقررات التي تم دراستها في هذا الفصل ويتم احتسابه على النحو التالي:

$$\text{متوسط نقاط الدرجات للفصل الدراسي GPA} = \frac{\text{مجموع النقاط لجميع المقررات التي أكملها الطالب}}{\text{مجموع الساعات المعتمدة لجميع المقررات التي أكملها الطالب خلال الفصل الدراسي}}$$

- يمثل متوسط نقاط الدرجات التراكمي CGPA متوسط نقاط الدرجات الإجمالية التي حصل عليها الطالب خلال البرنامج الدراسي وذلك لأقرب رقمين عشريين ويتم احتسابه على النحو التالي:

$$\text{متوسط نقاط الدرجات الإجمالية (المعدل التراكمي) CGPA} = \frac{\text{مجموع النقاط لجميع المقررات التي أكملها الطالب}}{\text{مجموع الساعات المعتمدة لجميع المقررات المحتسبة}}$$

مادة (١١): الخطة الدراسية ومجالات الدراسة

تبين الجداول التالية المقررات الدراسية التي تدرس لنيل شهادة "الدبلوم المهني في الكيمياء الحيوية والتحليل الإكلينيكي" وعدد الساعات المعتمدة والاختبارات التحريرية والشفوية والعملية لكل مقرر والنهاية العظمى للدرجات المخصصة لكل امتحان، ويكون زمن الإمتحان النظري ساعتان للمقررات التي عدد ساعاتها النظرية ساعتان، وثلاث ساعات للمقررات التي عدد ساعاتها النظرية ثلاث ساعات.

تفسير الأكواد:

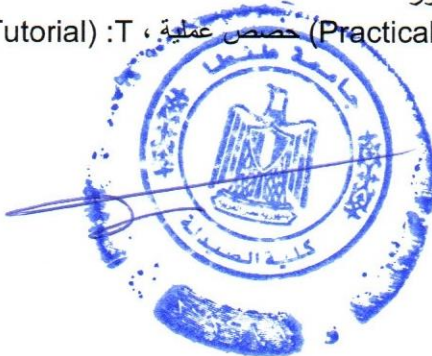
الحروف من اليسار: BC مقرر يدرس بكلية الصيدلة - قسم الكيمياء الحيوية

MD مقرر يدرس بكلية الطب

الأرقام من اليسار: الرقم الأول يمثل الفصل الدراسي

الرقمان الثاني والثالث يمثلان رقم المقرر

L: (Lectures) محاضرات نظرية ، P: (Practical): حصص عملية ، T: (Tutorial) حلقات نقاش

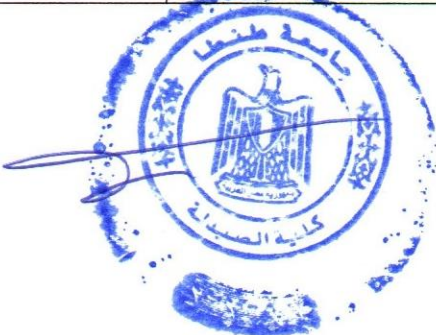


Courses of the First Semester					Exam Marks			
No.	Course Title	Course Code	Credit Hours	Contact Hours L+P/T	Written	Practical	Oral	Total
1	Advanced Biochemistry (I) الكيمياء الحيوية المتقدمة (١)	BC-101	3	3+0	80	-	20	100
2	Clinical Chemistry (I) الكيمياء الإكلينيكية (١)	BC-102	3	2+2	60	25	15	100
3	Bioanalysis (I) تحليل حيوي (١)	BC-103	3	2+2	60	25	15	100
4	Physiology فسيولوجي	MD-101	3	3+0	80	-	20	100
5	Good Laboratory Practice الممارسة العملية الجيدة	BC-104	2	2+0	80	-	20	100
Total Credit Hours			14					

Courses of the Second Semester					Exam Marks			
No.	Course Title	Course Code	Credit Hours	Contact Hours L+P/T	Written	Practical	Oral	Total
1	Advanced Biochemistry (II) الكيمياء الحيوية المتقدمة (٢)	BC-205	3	3+0	80	-	20	100
2	Clinical Chemistry (II) الكيمياء الإكلينيكية (٢)	BC-206	3	2+2	60	25	15	100
3	Bioanalysis (II) تحليل حيوي (٢)	BC-207	3	2+2	60	25	15	100
4	Clinical Nutrition التغذية الإكلينيكية	BC-208	2	2+0	80	-	20	100
5	Hematology علم أمراض الدم	MD-202	3	2+2	60	25	15	100
Total Credit Hours			14					

Course Description (First Semester)

Course Title, Code & Credit Hours	Course Content
Advanced Biochemistry (I) BC-101 (3+0)	Enzyme kinetics and regulation, Cellular components, Plasma membrane, Intermediary metabolism of dietary components (carbohydrates, lipids, proteins), Integration of metabolism (feed/fast cycle, obesity), Inborn error of metabolism, Cell cycle and cell division, Disorders of cell cycle, Apoptosis
Clinical Chemistry (I) BC-102	Abnormalities of plasma proteins and lipid profile, Enzymes of clinical significance, Diabetes mellitus, Hepatic biomarkers, Renal biomarkers,



(2+1)	Pathophysiology of liver and kidney diseases, Cardiovascular biomarkers, Calcium homeostasis and regulation, Inflammation and inflammatory mediators Practical: Analysis and case study of liver function tests (total proteins, albumin, bilirubin, transaminases), kidney function tests (clearance, serum creatinine, urea), cardiac function (lactate dehydrogenase, creatine kinase, troponin), liver fibrosis, and kidney failure
Bioanalysis (I) BC-103 (2+1)	Basic principles of bioanalysis, Laboratory safety and regulation, Analytical method evaluation, Basic separation techniques, Spectrophotometry and photometry, pH and buffer systems, Body fluid analysis, Chromatography, Analytical techniques for plasma components (glycemic markers, lipid profile, amino acids) Practical: Specimen collection, processing and preservation, Laboratory mathematics and calculations, Urine analysis (normal & pathological constituents), Urine analysis report, Precipitation of proteins, Identification of protein metabolites, Detection of isoelectric point of proteins, Chromatographic separation of amino acids, Glucose tolerance test, Assay of glycated hemoglobin, Fatty acid analysis, Measurement of ketone bodies and lipid profile
Physiology MD-101 (3+0)	The salivary secretion, Deglutition, The stomach, The pancreas, Bile secretion and gall bladder, The liver, The small intestine, The large intestine, Absorption, The kidney, Sodium and water regulation, Regulation of potassium, hydrogen and calcium, Cardiovascular system
Good Laboratory Practice BC-104 (2+0)	Levels of laboratories, Personnel (training and development), Equipments, Reagents and materials, Types of specimen, Requisition form, Worksheet, Reporting test results, Specimen rejection record, Data management, Standard operating procedures, Safety in laboratories, Ethical considerations

Course Description (Second Semester)

Course Title, Code & Credit Hours	Course Content
Advanced Biochemistry (II) BC-205(3+0)	Homeostasis, Steroid chemistry, Phospholipid chemistry, Hemoglobin and porphyrin metabolism, Bioenergetics and ATP production, Signal transduction, DNA replication and repair, Gene expression, Gene therapy, Cancer biology, Oxidative stress and antioxidants
Clinical Chemistry (II) BC-206	Diagnostic and prognostic tumor markers, Electrolyte disturbance, Hypofunction and hyperfunction of anterior pituitary gland, posterior pituitary gland, thyroid gland and adrenal gland, Disorders of pancreatic



(2+1)	hormones, GIT hormones and sex hormones, Clinical chemistry for geriatric and pediatric patients, Immune dysfunction and autoimmune diseases Practical: Tissue culture (principle, procedure, and applications), Flow cytometry (principle, procedure, and applications), Immunohistochemistry (principle, procedure, and applications), Measurement of blood electrolytes, Assessment of pituitary function, thyroid function, and adrenal hormones, Assessment of pancreatic function, Assessment of malabsorption and maldigestion, Case study (geriatric patients&pediatric patients)
Bioanalysis (II) BC-207 (2+1)	Analysis of blood gases, Electrophoresis, Immunoassays, Nucleic acid-based techniques, Heavy metal toxicity, Drug addiction, Safety guidelines in the microbiology laboratory, Microbial culture techniques (principle, procedure, types and applications), Serological tests, Testing sensitivity to antimicrobial substances Practical: Assessment of acid-base homeostasis, Electrophoretic separation of proteins & nucleic acids, Western blotting technique applications, ELISA assay of insulin, Isolation of nucleic acids, Detection of purity of DNA and RNA, DNA sequencing, Gene cloning and analysis, DNA fingerprinting, Measurement of some metals' toxicity, Cocaine assessment test, Measurement of blood alcohol content, Preparation of smears, Staining of smears
Clinical Nutrition BC-208 (2+0)	Principles of healthy nutrition, Vitamins & minerals, Nutritional Assessment, Diet regimen therapy, Aging and nutrition, Cancer and nutrition, Nutrigenetics and nutrigenomics, Internal and parenteral nutrition
Hematology MD-202 (2+1)	Haemoglobin synthesis, Haemostasis and blood coagulation, Haemorrhagic disorders, Thrombocytes, Erythrocytes, Anemia (iron deficiency, aplastic, pernicious, haemolytic), Erythropoiesis, Blood groups, Platelet disorders, Leucocytes, Leukemia (acute, chronic, lymphoblastic, myelogenous), Stem cells Practical: Bone marrow aspiration and morphology, Automated analysis of blood cells, Complete blood count (CBC), Laboratory detection of haemoglobinopathies and thalasemias, Antenatal diagnosis of haematologic disorders, Electrophoretic and immunochemical analysis of human immunoglobulins, Use of molecular techniques in the analysis of haematologic diseases





Professional

**Diploma in Biochemistry
and Clinical Analysis**



Credit Hours System

2016



Professional Diploma in Biochemistry and Clinical Analysis

Academic regulations
2016

Article (1): Program Objectives

This program aims to prepare leading cadres with high professionalism in the applied field of biochemistry and clinical analysis, and to provide students with scientific capabilities and practical skills that enable them to conduct diagnostic laboratory measurements and actively participate in providing services to patients through their role in the health care team.

Article (2): Academic Certificate

The Tanta University Council grants, upon the request of the College of Pharmacy, the certificate of "Professional Diploma in Biochemistry and Clinical Analysis".

Article (3): Duration and language of study

The duration of the study is one year, including two semesters, each of which is 17 weeks including examinations, at a rate of 14 credit hours per week for each semester, and the language of study in the program is English.

Article (4): Study system

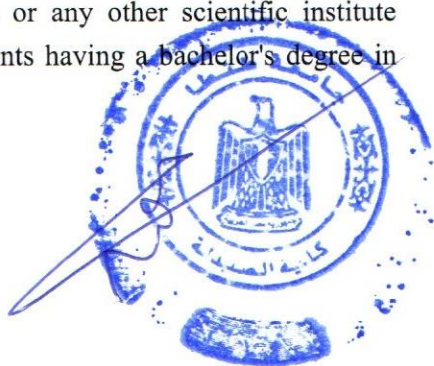
The study is based on the credit hours system. The credit hour is the basis for determining the student's academic load in each semester. The credit hour is equivalent to a theoretical lecture of one hour per week or laboratory or practical training of two or three hours per week or a period of field clinical training of three or four hours per week throughout the semester.

Article (5): Application dates for joining the program

Application for the diploma is allowed on August every year, and the examinations dates are determined based on the suggestion of the Executive Committee, the decision of the Faculty Council, and the approval of the University Council.

Article (6): Requirements for enrollment in the program

To enroll in the "Professional Diploma in Biochemistry and Clinical Analysis", a student must have the Bachelor Degree of Pharmacy/Pharmaceutical Sciences or its equivalent from a university inside or outside the Arab Republic of Egypt or any other scientific institute recognized by the Supreme Council of Universities. Students having a bachelor's degree in





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medicine and surgery, or bachelor's degree in veterinary medicine, or bachelor's degree in science (Biochemistry major) could admit to the program.

The students will be enrolled after fulfilling the following general requirements:

1. Certificate of academic qualification.
2. A certificate of the academic courses studied by the student and his grades at the bachelor's stage.
3. Official certified birth certificate.
4. A consent of the employer's approval on the student's study if the student is an employee.
5. A copy of the national identification number.
6. Payment of tuition fees and other educational services.

Laws and rules governing the admission and enrollment of foreign students in Egyptian universities are applied according to the Egyptian Universities Organization Law.

Article (7): Suspension of registration

The suspension of registration shall be in accordance with the provisions of the Universities Organization Law and its implementing regulations, and in accordance with the decisions of the University Council in this regard.

Article (8): Registration cancellation

The College Council revokes the student's registration based on the approval of the Executive Committee in the following cases:

1. If the applicant does not pay the fees for tuition or courses registration.
2. If the applicant submits a request to cancel his/her registration.
3. If the student drops out of study without an acceptable excuse for two consecutive years.

Article (9): Re-registration

If the student's registration is cancelled for one of the reasons mentioned in **Article (8)** in these regulations, the Higher Committee and the University Council may, based on the suggestion of the Executive Committee and the approval of the College Board, approve the re-registration.





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Article (10): Examinations and evaluation system

- To attend the exam, the student must have completed an attendance rate of not less than 75% of the hours allocated to the course.
- For a student to succeed in any course, he/she must attend all types of course exams and obtain at least 60% of the total score assigned to this course.
- The following tables show the calculation of the grades for the academic course and the relationship between the general grade and the cumulative CGPA.

Calculating Grades of Courses			
Points	Percentage	Symbol	Grade
5	Greater than or equal to 90%	A+	Excellent
4.5 to less than 5	85 to less than 90%	A	
4 to less than 4.5	80 to less than 85%	B+	Very Good
3.5 to less than 4	75 to less than 80%	B	
3 to less than 3.5	70 to less than 75%	C+	Good
2.5 to less than 3	65 to less than 70%	C	
2 to less than 2.5	60 to less than 65%	D	Pass
Less than 2	Less than 60%	F	Fail

The relation between the General Grade and CGPA			
Grade	Symbol	CGPA**	Percentage of Cumulative Points
Excellent	A+	5	Greater than or equal to 90%
	A	4.5-<5	85 to less than 90%
Very Good	B+	4- <4.5	80 to less than 85%
	B	3.5- <4	75 to less than 80%
Good	C+	3-<3.5	70 to less than 75%
	C	2.5-<3	65 to less than 70%
Pass	D	2-<2.5	60 to less than 65%

**If the student has CGPA score of less than 2, he/she is allowed to re-register in some courses to improve the GPA, in which case the higher grade is calculated.





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The semester Grade Point Average (GPA) represents the courses studied in a semester and is computed as follows: Sum of multiplying the number of grade points obtained by the student in each course by the number of credit hours of that course, for all courses accomplished by the student, divided by the total number of hours in the semester - to the nearest two decimal numbers.

$$\text{GPA} = \frac{\text{Sum of Grade Points of all courses completed by the student in the semester}}{\text{Sum of credits hours of all courses completed by the student in the semester}}$$

The Cumulative GPA (CGPA) is the average of all final grades obtained by the student within the program to the nearest two decimal numbers. It is calculated as follows:

$$\text{CGPA} = \frac{\text{Sum of Grade Points of all courses completed by the student in the program}}{\text{Sum of credits hours of all courses of the program}}$$

Article (11): The study plan

The following tables show the courses taught in the "Professional Diploma in Biochemistry and Clinical Analysis", the number of credit hours, and the written, oral and practical exams for each course and the maximum grades assigned to each exam. The theoretical exam time is two hours for the courses whose theoretical hours are two hours, and three hours for the courses whose theoretical hours are three.

Interpretation of course code:

- Letters from the left:

BC: Course taught at the Faculty of Pharmacy - Department of Biochemistry.

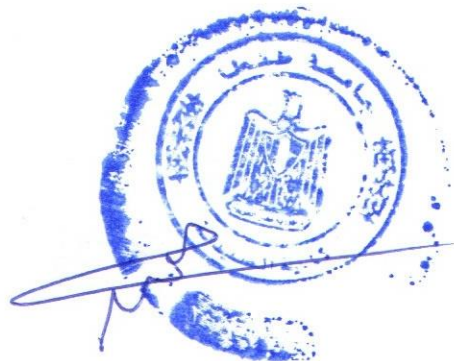
MD: Course taught at the Faculty of Medicine.

- The numbers from the left:

The first number represents the semester.

The second and third numbers represent the course number.

L: lectures, P: practical, T: tutorial.





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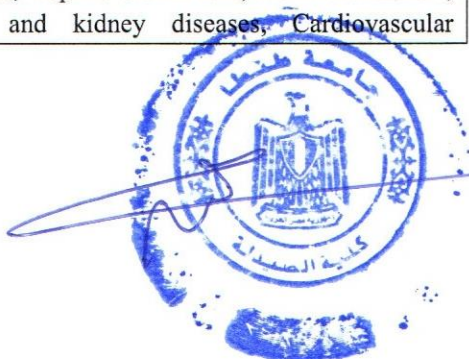


Courses of the First Semester					Exam Marks			
No.	Course Title	Course Code	Credit Hours	Contact Hours L+P/T	Written	Practical	Oral	Total
1	Advanced Biochemistry (I)	BC-101	3	3+0	80	-	20	100
2	Clinical Chemistry (I)	BC-102	3	2+2	60	25	15	100
3	Bioanalysis (I)	BC-103	3	2+2	60	25	15	100
4	Physiology	MD-101	3	3+0	80	-	20	100
5	Good Laboratory Practice	BC-104	2	2+0	80	-	20	100
Total Credit Hours			14					

Courses of the Second Semester					Exam Marks			
No.	Course Title	Course Code	Credit Hours	Contact Hours L+P/T	Written	Practical	Oral	Total
1	Advanced Biochemistry (II)	BC-205	3	3+0	80	-	20	100
2	Clinical Chemistry (II)	BC-206	3	2+2	60	25	15	100
3	Bioanalysis (II)	BC-207	3	2+2	60	25	15	100
4	Clinical Nutrition	BC-208	2	2+0	80	-	20	100
5	Hematology	MD-202	3	2+2	60	25	15	100
Total Credit Hours			14					

Course Description (First Semester)

Course Title, Code & Credit Hours	Course Content
Advanced Biochemistry (I) BC-101 (3+0)	Enzyme kinetics and regulation, Cellular components, Plasma membrane, Intermediary metabolism of dietary components (carbohydrates, lipids, proteins), Integration of metabolism (feed/fast cycle, obesity), Inborn error of metabolism, Cell cycle and cell division, Disorders of cell cycle, Apoptosis
Clinical Chemistry (I) BC-102 (2+1)	Abnormalities of plasma proteins and lipid profile, Enzymes of clinical significance, Diabetes mellitus, Hepatic biomarkers, Renal biomarkers, Pathophysiology of liver and kidney diseases, Cardiovascular





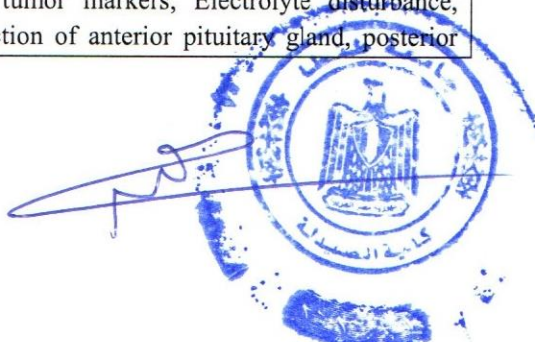
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	biomarkers, Calcium homeostasis and regulation, Inflammation and inflammatory mediators Practical: Analysis and case study of liver function tests (total proteins, albumin, bilirubin, transaminases), kidney function tests (clearance, serum creatinine, urea), cardiac function (lactate dehydrogenase, creatine kinase, troponin), liver fibrosis, and kidney failure
Bioanalysis (I) BC-103 (2+1)	Basic principles of bioanalysis, Laboratory safety and regulation, Analytical method evaluation, Basic separation techniques, Spectrophotometry and photometry, pH and buffer systems, Body fluid analysis, Chromatography, Analytical techniques for plasma components (glycemic markers, lipid profile, amino acids) Practical: Specimen collection, processing and preservation, Laboratory mathematics and calculations, Urine analysis (normal & pathological constituents), Urine analysis report, Precipitation of proteins, Identification of protein metabolites, Detection of isoelectric point of proteins, Chromatographic separation of amino acids, Glucose tolerance test, Assay of glycosylated hemoglobin, Fatty acid analysis, Measurement of ketone bodies and lipid profile
Physiology MD-101 (3+0)	The salivary secretion, Deglutition, The stomach, The pancreas, Bile secretion and gall bladder, The liver, The small intestine, The large intestine, Absorption, The kidney, Sodium and water regulation, Regulation of potassium, hydrogen and calcium, Cardiovascular system
Good Laboratory Practice BC-104 (2+0)	Levels of laboratories, Personnel (training and development), Equipment, Reagents and materials, Types of specimen, Requisition form, Worksheet, Reporting test results, Specimen rejection record, Data management, Standard operating procedures, Safety in laboratories, Ethical considerations

Course Description (Second Semester)

Course Title, Code & Credit Hours	Course Content
Advanced Biochemistry (II) BC-205(3+0)	Homeostasis, Steroid chemistry, Phospholipid chemistry, Hemoglobin and porphyrin metabolism, Bioenergetics and ATP production, Signal transduction, DNA replication and repair, Gene expression, Gene therapy, Cancer biology, Oxidative stress and antioxidants
Clinical Chemistry (II) BC-206	Diagnostic and prognostic tumor markers, Electrolyte disturbance, Hypofunction and hyperfunction of anterior pituitary gland, posterior

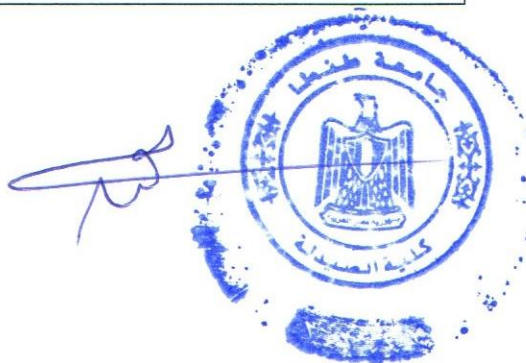


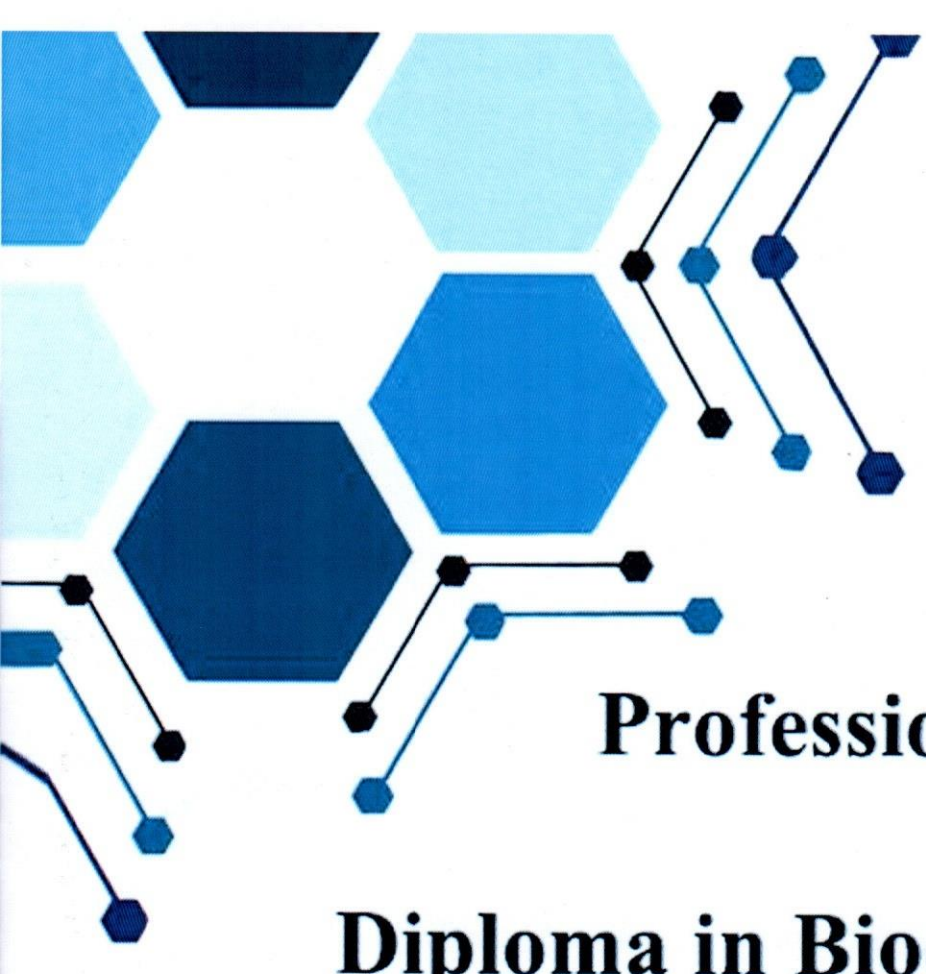


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(2+1)	pituitary gland, thyroid gland and adrenal gland, Disorders of pancreatic hormones, GIT hormones and sex hormones, Clinical chemistry for geriatric and pediatric patients, Immune dysfunction and autoimmune diseases Practical: Tissue culture (principle, procedure, and applications), Flow cytometry (principle, procedure, and applications), Immunohistochemistry (principle, procedure, and applications), Measurement of blood electrolytes, Assessment of pituitary function, thyroid function, and adrenal hormones, Assessment of pancreatic function, Assessment of malabsorption and maldigestion, Case study (geriatric patients&pediatric patients)
Bioanalysis (II) BC-207 (2+1)	Analysis of blood gases, Electrophoresis, Immunoassays, Nucleic acid-based techniques, Heavy metal toxicity, Drug addiction, Safety guidelines in the microbiology laboratory, Microbial culture techniques (principle, procedure, types and applications), Serological tests, Testing sensitivity to antimicrobial substances Practical: Assessment of acid-base homeostasis, Electrophoretic separation of proteins & nucleic acids, Western blotting technique applications, ELISA assay of insulin, Isolation of nucleic acids, Detection of purity of DNA and RNA, DNA sequencing, Gene cloning and analysis, DNA fingerprinting, Measurement of some metals' toxicity, Cocaine assessment test, Measurement of blood alcohol content, Preparation of smears, Staining of smears
Clinical Nutrition BC-208 (2+0)	Principles of healthy nutrition, Vitamins & minerals, Nutritional Assessment, Diet regimen therapy, Aging and nutrition, Cancer and nutrition, Nutrigenetics and nutrigenomics, Internal and parenteral nutrition
Hematology MD-202 (2+1)	Haemoglobin synthesis, Haemostasis and blood coagulation, Haemorrhagic disorders, Thrombocytes, Erythrocytes, Anemia (iron deficiency, aplastic, pernicious, haemolytic), Erythropoiesis, Blood groups, Platelet disorders, Leucocytes, Leukemia (acute, chronic, lymphoblastic, myelogenous), Stem cells Practical: Bone marrow aspiration and morphology, Automated analysis of blood cells, Complete blood count (CBC), Laboratory detection of haemoglobinopathics and thalasemias, Antenatal diagnosis of haematologic disorders, Electrophoretic and immunochemical analysis of human immunoglobulins, Use of molecular techniques in the analysis of haematologic diseases





Professional Diploma in Biochemistry and Clinical Analysis

Credit Hours System



2016