

المركز الوطني لضمان جودة واعتماد
المؤسسات التعليمية والتدريبية



المتطلبات الأكاديمية للمقرر الدراسي

اسم المؤسسة التعليمية: جامعة بنغازى- كلية الطب

اسم البرنامج التعليمي: بكالوريوس طب وجراحة

اسم المقرر: Biochemistry I

رمز المقرر: 1103

الفصل/العام الدراسي 2026/2025

المتطلبات الأكاديمية للمقرر الدراسي

1. معلومات عامة:

Biochemistry I	اسم المقرر الدراسي	1
د. محمد المنصوري	منسق المقرر	2
Biochemistry department	القسم / الشعبة التي تقدم البرنامج	3
	الأقسام العلمية ذات العلاقة بالبرنامج	4
117	الساعات الدراسية للمقرر	5
English	اللغة المستخدمة في العملية التعليمية	6
1 st year	السنة الدراسية/ الفصل الدراسي	7
	تاريخ وجهة اعتماد المقرر	8

1.1 عدد الساعات الأسبوعية:

محاضرات 5 معامل 2 تدريب المجموع 7

2- أهداف المقرر:

- 1) Acquire comprehensive knowledge of basic biochemical structures of macromolecules inside the body and its biological significance
- 2) Acquire the basic knowledge related to body fluid composition and their clinical significance
- 3) Acquire basic skills on handling chemicals and performing various biochemical procedures in safe manner
- 4) Recognize the molecular architecture of eukaryotic cells and organelles, including membrane structure and dynamics
- 5) Acquire critical thinking to relate daily dietary requirements and their clinical correlation
- 6) Acquire problems solving skills for self and lifelong learning
- 7) Acquire communication, and team working skills that are essential for them to become active members in society

3-مخرجات التعلم المستهدفة:
أ.المعرفة والفهم.

Discuss amino acids and proteins, enzymes, carbohydrates and lipid's structure, function and their clinical correlation	1أ
Discuss nucleic acid chemistry, and biological function of nutrition	2أ
Describe the features of the different biochemical molecules related to body fluids including blood and CSF and mosaic model of the cell membrane	3أ
Explain the structure, function and clinical significance of immunoglobulin, vitamins, minerals.	4أ

ب-المهارات الذهنية:

Interpret abnormal biochemical tests result of amino acids and proteins, enzymes, carbohydrates and lipid's	1ب
Compare the different types of nucleic acids and apply critical thinking to relate daily dietary requirements to their clinical implications.	2ب
Analysis the features of the different biochemical molecules related to body fluids including blood and CSF and mosaic model of the cell membrane	3ب
Distinguish between different types of vitamins, and minerals along with their clinical significance	4ب

ج-المهارات العلمية والمهنية:

Handle chemicals and various body fluids sample and handling chemicals and various biochemical procedures in safe manner	1ج
Compare between types of nucleic acid and process of protein synthesis	2ج
Estimate different biochemical substance in the urine	3ج
Demonstrate biochemistry lab regarding estimation vitamin level in human	4ج

د-المهارات العامة:

Communicate effectively with their colleagues and teachers.	1د
Demonstrate molecular technique	2د
Be an influential part of a teamwork and aware of team dynamics	3د
Demonstrate professional and ethical behavior in academic and laboratory environments	4د

رقم النموذج ط.ا.ب (011)	تاريخ الاصدار : 01 / 01 / 2009 م	تعديل رقم (2)	تاريخ التحديث 08 / 08 / 2023 م
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4-محتوى المقرر:

Topics to be covered in the module: List of Topics	Total teaching hours	Teaching strategy		
		Lecture	Practical	New strategy
Laboratory safety	2		2	
Introduction to colorimetric	2		2	
Chemistry of amino acids and proteins	19	15	4	
Structure and classification amino acids		2		
Properties of amino acids		2		
Structure of protein and levels of protein organization		2		
Protein misfolding		1		online
Protein denaturation		2		
Globular proteins and their clinical correlation		3		
Fibrous proteins and their clinical correlation		3		
Estimation of total serum proteins			2	
measurement of serum albumin			2	
Enzymes	12	12		
properties and function of enzymes		2		
Nomenclature and classes of enzymes		1		
Enzyme related terms (proenzyme, coenzyme, cofactors, prosthetic group, holoenzyme, zymogen)		1		
Mechanism of enzyme action		1		
Models of substrate-enzyme interaction		1		
Factors affecting enzyme activity		1		online
Michaelis Minton equation and line weaver pork plot		1		
Regulation of enzyme activity		2		

Enzyme inhibition		1		
Isoenzymes and its clinical importance		1		
Vitamins	14	12	2	
Definition and classification		1		
Introduction (Water soluble vitamins)		1		
Thiamine (B1)				
Riboflavin (B2), Niacin (B3), Pantothenic Acid (B5)		2		
Pyridoxine (B6), Biotin (B7)		1		
Vitamin B12, Folic acid (B9)		2		
Introduction (Fat soluble vitamins) , Vitamin A		2		
Vitamin D, Vitamin C		2		
Vitamin K, Vitamin E		1		
Estimation of serum Vitamin D			2	
Clinical enzymology	8	6	2	
Classification of plasma enzymes and Causes of abnormal plasma enzymes level		1		
Role of Enzymes as biomarkers in diagnosis of liver disorder		1		
Role of Enzymes as biomarkers in diagnosis of MI		1		online
Role of Enzymes as biomarkers in diagnosis of pancreatitis and in diagnosis and monitoring of cancer		1		
Medical importance of enzymes and enzyme inhibitors		1		
Enzyme deficiency diseases		1		Flipped classroom
Estimation of serum transaminases			2	
Carbohydrate chemistry	8	8		
Definition, functions and classification of carbohydrates		1		
Monosaccharaide structures and their forms		2		
General properties for the most common monosaccharaides		1		online
Physical and chemical properties of monosaccharaides		1		online
Structures and properties of Disaccharides		1		
Structures and functions of Polysaccharides		1		
The differences between proteoglycans and glycoproteins		1		
Lipid chemistry	6	6		
Definition and classification of lipids		2		online
Classification and properties of fatty acid		2		
Compound and derived lipids		2		
Nucleic acid	6	6		
Structure of nucleotide		1		

Structure and function of DNA		1		online
DNA packaging into chromatin and chromosome		1		
Structure and function of RNA		1		
Difference between DNA and RNA		1		
Central dogma of life		1		
Clinical nutrition	6	6		
Dietary reference intake		1		
Energy requirement in human.		1		
Dietary fats		1		
Dietary carbohydrates		1		
Dietary protein and nitrogen balance.		1		
Kwashiorkor, marasmus and obesity		1		
Minerals	12	8	4	
Calcium metabolism, regulation, function, disorders in the metabolism		1		
Phosphorus metabolism, regulation, function, disorders in the metabolism		1		
Sodium and Potassium metabolism, regulation, function, disorders in the metabolism		1		online
Chloride, Magnesium and Potassium metabolism, regulation, function, disorders in the metabolism		1		online
Iron metabolism, regulation, function, disorders in the metabolism		1		
Zinc metabolism, regulation, function, disorders in the metabolism		1		
Copper, Iodine, Fluoride and Selenium, metabolism, regulation, function, disorders in the metabolism		2		
Estimation of serum calcium			2	
Estimation of serum phosphorus			2	
Body fluids	8	6	2	
Body fluid compartments		1		online
Chemical Composition of body fluids		1		
Cations and anions balance		1		
Specialized Body fluids in health and disease , Milk		1		
CSF		1		
Semen and amniotic fluid		1		
Urine analysis			2	
Immunochemistry	10	6	4	
Immune system and immune responses.		1		
Basic structures and classes of human immunoglobulin and their clinical significant		2		
Chemical nature of antigens and their receptor		1		
Immune system disorders		2		online

Performing venipuncture			2	
Inserting cannula into peripheral veins			2	
Cell membrane	4	4		
Structure of cell membrane		2		
Function of cell membrane		1		
Transport of molecules through cell membrane		1		
Total	117	95	22	-

5- طرق التعليم والتعلم:

1. Illustrated lectures
2. practical
3. TBL
4. Flipped class room

6- طرق التقييم:

ملاحظات	النسبة المئوية	تاريخ التقييم	طرق التقييم	ت
الدور الأول				
	20%	نوفمبر	امتحان نصفي نظري	1
	50%	مايو 2026	امتحان نهائي نظري	2
5degree activity 20 lab exam	20%	مايو 2026	امتحان نهائي عملي	3
	10%	مايو 2026	امتحان نهائي شفهي	4
	%100		المجموع	
الدور الثاني				
	70%	يوليو 2026	امتحان نظري	
	20%	يوليو 2026	امتحان عملي	
	10%	يوليو 2026	امتحان شفهي	
	100%		المجموع	

7- المراجع والدوريات:

العنوان	الناشر	النسخة	المؤلف	مكان تواجدها
مذكرات المقرر	Lecture notes			Biochemistry department
الكتب الدراسية المقررة	Lippincott illustrated reviews: Biochemistry	7th edition	Ferrier, D. R. Philadelphia, PA: Wolters .Kluwer.2017	library
كتب مساعدة	Harper's Illustrated Biochemistry	31 st edition	Rodwell V.W. Bender D.A., Botham K.M., Kennelly P.J., Weil: New York. McGraw Hill. 2018	library
	Clinical • biochemistry: an illustrated colour text,	5 th Edition	Gaw, A. Michael J. Murphy, Rajeev Shrivastava, Robert A. Cowan. Denis O'Reilly.. Edinburgh, Scotland : Churchill Livingstone : Elsevier.2013.	Bookshop in the college
	Textbook of • biochemistry with clinical correlations	7th edition	Devlin, M Thomas. Hoboken, N.J.: John Wiley & Sons; 2011.	library

8-الإمكانات المطلوبة لتنفيذ المقرر:

ت	الإمكانات المطلوب توفرها	ملاحظات
1	Equipped Classes with educational facilities (Smart Board, Data show, Audio System, Computer, white board).	
2	Biochemistry lab	
3		
4		
5		

منسق المقرر: دكتور محمد المنصوري

التوقيع

منسق البرنامج: دكتورة ساره علي شعيب بو عوينه.....

التوقيع

التاريخ...../...../.....م

رقم النموذج م. ا. م (011)	تاريخ الاصدار : 01 / 01 / 2009 م	تعديل رقم (2)	تاريخ التحديث 08 / 08 / 2023 م
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مصفوفة المقرر الدراسي (1103)

المهارات													المعرفة والفهم				الأسبوع الدراسي
(ج) المهارات العامة					(ب) المهارات العلمية والمهنية				(أ) المهارات الذهنية				4.أ	3.أ	2.أ	1.أ	
4.د	4.د	3.د	2.د	1.د	4.ج	3.ج	2.ج	1.ج	4.ب	3.ب	2.ب	1.ب	4.أ	3.أ	2.أ	1.أ	
✓	✓	✓	✓	✓				✓						✓		✓	1
✓	✓	✓	✓	✓				✓						✓		✓	2
✓	✓	✓	✓	✓				✓	✓			✓				✓	3
✓	✓	✓	✓	✓		✓		✓	✓			✓				✓	4
✓	✓	✓	✓	✓		✓		✓	✓			✓				✓	5
✓	✓	✓	✓	✓				✓				✓				✓	6
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✓	✓	✓	✓	✓			✓	✓							✓		18
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✓	✓	✓	✓	✓	✓			✓	✓			✓	✓				21
✓	✓	✓	✓	✓	✓			✓	✓			✓	✓				22
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	23

