Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED SCIENCES

Faculty of Laboratory medicine..

Department of BIOCHMASTRY And Molecular Biology

Course Specification of Medical Biochemistry 1 (introduction)

Course No. (03.01.312)

2023/2022

Course name :Medical Biochemistry 1 (introduction)

I. Course Identification and General Information:						
1	**Course Title:**	Medical Biochemistry 1 (introduction)				
2	**Course Code & Number:**	03.01.312				
3	**Credit Hours:**	**Theory Hours**				
		Lecture	**Exercise**	Practical	**Credit Hours**	
		2	0	2	3	
4	**Study Level/ Semester at which this Course is offered:**	2nd year and 1st semester				
5	**Pre –Requisite (if any):**	Biology and General Chemistry				
6	**Co –Requisite (if any):**	None				
7	**Program (s) in which the Course is Offered:**	FACULTY OF LABORATORY MEDICINE				
8	**Language of Teaching the Course:**	English				
9	**Study System:**	semester				
10	**Mode of Delivery:**	Regular				
11	**Location of Teaching the Course:**	University Campus				
12	**Prepared by:**	Dr. Nabeel Aloery				
13	**Date of Approval:**	2022-2023				

II. Course Description:

This course offers detailed study of the chemical compositions and the biological functions of the main biochemical molecules including carbohydrates, proteins, lipids and their components, enzymes, hormones, nucleic acids and vitamins.
The practical part includes methods of qualitative and quantitative determinations of carbohydrates, proteins, amino acids, lipids, fatty acids and vitamins

III. Alignment Course Intended Learning Outcomes with program outcomes		
III. Course Intended Learning Outcomes (CILOs)		**Referenced PILOs**
A. Knowledge and Understanding: ***Upon successful completion of the course, students will be able to:***		
a1	**Discuss** the core aspects of different structure of carbohydrates, proteins, lipids, nucleic acids, enzymes and vitamins.(Definition, functions, Classification).	**A1**
B. Intellectual Skills: ***Upon successful completion of the course, students will be able to:***		
b1	**Analyze** basic biochemical reactions and correlate these with the laboratory findings.	B**3**
C. Professional and Practical Skills: ***Upon successful completion of the course, students will be able to:***		
c1	**Perform** clinical laboratory tests commonly encountered in Biochemistry	**C1**
D. Transferable Skills: ***Upon successful completion of the course, students will be able to:***		
d1	Self-learning skills and knowledge to new situations.	**D4**

IV. Alignment Course Intended Learning Outcomes with Teaching Strategies and Assessment methods :			
(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	**Discuss** the core aspects of different structure of carbohydrates, proteins, lipids, nucleic acids, enzymes and vitamins.(Definition, functions, Classification)	Lectures	Exam

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Analyze basic biochemical reactions and correlate these with the laboratory findings.	Lectures	Exam
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	**Perform** clinical laboratory tests commonly encountered in Biochemistry	Lab Work	Practical exam
(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Self-learning skills and knowledge to new situations.	Lectures Practical session	exam Practical exam

V. Course Content:					
A – Theoretical Aspect:					
NO.	**Units/Topics List**	**Sub Topics List**	**Number of Weeks**	**contact hours**	**Learning Outcomes (CILOs)**
1	**Carbohydrates**	•Introduction to carbohydrates •Classification of monosaccharides • Common	3	6	a1

		monosaccharides • Monosaccharides reactions and derivatives • Oligosaccharides and polysaccharides			
2	**Lipids**	• Introduction to lipids • Classification of lipids • Fatty acids structure and properties • • Glyceride and non-glyceride lipids • Biomembranes	2	4	a 1.b1
3	**Proteins and amino acids**	• Introduction to proteins and amino acids • Biological importance of proteins • Amino acids classification, properties, and reactions • Important peptides • Proteins structure and classifications	3	10	a1 ,b1
4	MED TERM		1	2	
5	**Nucleic acids**	• Nucleotides structure and function • DNA structure and properties • RNA structure and properties	2	4	a 1,b1

6	**Vitamins**	• Classification • Functions and metabolism • Vitamins/minerals deficiency and associated disorders	2	4	a 1,b1
16	FINAL THEORTICAL		1	2	
			16	32	

B - Practical Aspect: (if any)				
Order	**Tasks/ Experiments**	**Number of Weeks**	**contact hours**	**Learning Outcomes**
1	**Orientation**	**1**	**2**	**a1**
2	**Water, PH and Buffer -1&2**	**1**	**2**	**b1 ,c1**
3	**Carbohydrate chemistry: Molish test**	**1**	**2**	**c 1,d1**
4	**Carbohydrate chemistry: Iodine test**	**1**	**2**	**c1 .d1**
5	**Carbohydrate chemistry: Barfoed test**	**1**	**2**	**c1,d1**
6	**Carbohydrate chemistry: Benedict test**	**1**	**2**	**c1 ,d1**
7	**Carbohydrate chemistry: Bial's test and Seliwanoff's test**	**1**	**2**	**c1,d1**
8	**Lipid chemistry: Sudan III test**	**1**	**2**	**c 1.d1**
9	**Lipid chemistry: Test of saturation (Iodine)**	**1**	**2**	**c 1,d1**
10	**Lipid chemistry: molybdate test**	**1**	**2**	**c 1,d1**
11	**Lipid chemistry: Liebermann test for cholesterol**	**1**	**2**	**c1, d1**
12	**Amino Acids: Nin hydrine test and nitroprusside test**	**1**	**2**	**c1 ,d1**
13	**Amino Acids: Xanthoprothic test and Chromatography**	**1**	**2**	**c1 ,d1**
14	**Protein chemistry: Biuret test – Denaturation (Strong acid and Heavy Metals)**	**1**	**2**	**c1.d1**
15	**Final practical exams**	**1**	**2**	
Number of Weeks /and Units Per Semester		**15**	**28**	

IV. Teaching strategies of the course:	
1	**Lectures**

2	Practical Sessions
3	seminars

VI. Assessment Methods of the Course:

No	Assignment
1	Written Exams (Short Essays) and Quizzes
2	Multiple Choice Questions (MCQ)
3	Practical Exams (PE)

VII. Assignments:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	**Midterm Exam**	8	20	20%	a1, ,b1, ,c1
2	**Practical exam**	12	30	30%	a1, ,b1, ,c1,d1
3	**Final Exam**	16	50	50%	a1, ,b1, ,c1
	Total	100		100%	

VIII. Learning Resources:

1- Required Textbook

1 -	Ferrier Denise. Lippincott's illustrated reviews: Biochemistry, 7th edition, Wolters Kluwer. 2017.

2 -	Rodwell Victor, et al. Harper's Illustrated Biochemistry, 31th edition McGraw-Hill. 2018.
2- Essential References.	
1 -	Biochemistry (https://pubs.acs.org/journal/bichaw)
2 -	Biochemical Journal (https://portlandpress.com/biochemj)
3- Electronic Materials and Web Sites *etc*.	
1 -	https://www.ncbi.nlm.nih.gov/pubmed/ The medical biochemistry page (online textbook) : https://themedicalbiochemistrypage.org/
2-	1. MIT open courseware. Biological Chemistry I
	(https://ocw.mit.edu/courses/chemistry/5-07sc-biological-chemistry-ifall-2013/)
3	2. MIT open courseware. Biological Chemistry II
	(https://ocw.mit.edu/courses/chemistry/5-08j-biological-chemistry-iispring-2016/)
4	3. MIT open courseware. Biochemistry laboratory
	(https://ocw.mit.edu/courses/chemistry/5-36-biochemistry-laboratoryspring-2009/)
5	4. The medical biochemistry page (online textbook)
	https://themedicalbiochemistrypage.org

Course Policies:	
1	**Class Attendance:** -If the student dose not attend for more than 6 times, the student will be obligated to withdrew from the course
2	**Tardy**: -If the student dose not attend for more than 6 times, the student will be obligated to withdrew from the course
3	**Exam Attendance/Punctuality:** If any student does not attend the exam in the scheduled day, it will consider as a fail for him
4	**Assignments & Projects:** Any student dose not submithis assignment,he will lose its grade.
5	**Cheating:**

	Any student try to cheat in any quiz or exam, he will not be allowed to continue the exam and it will consider as a fail for him
6	Plagiarism: If any student try to plagiarism another student identity, both of them will be convertedto investigation and they might be expelled from the program
7	Other policies: Undelivered requirement will not be marked You should leave your dental Chair as clean as possible