Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED SCIENCES

Faculty of Laboratory medicine..

Department of Biochemistry and Molecular biology

Course Specification of Advanced Clinical Biochemistry
Course No. (03.11. 319)
2022/2023

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Ass.Pr. Dr. Ebtesam Al-Zabedi	Dr Nawal Al-Henhena	Dr Nawal Al-Henhena	Dr Gamil Taher Abdul Mughni	Ass.Pr. Dr. Ebtesam Al-Zabedi

I. Course Identification and General Information:

1	**Course Title:**	Advanced Clinical Biochemistry			
2	**Course Code & Number:**	03.11. 319			
3	**Credit Hours:**	**Theory Hours**			
		Lecture	**Exercise**	Practical	**Credit Hours**
		2	0	0	2
4	**Semester at which this Course is offered:**	1st Level /2nd Semester			
5	**Pre –Requisite (if any):**	Analytical Biochemistry I,Advanced Biochemistry I			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Master degree of Clinical Biochemistry & Molecular Biology			
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.Ebtesam Mahdi Al- Zabed			
13	**Date of Approval:**	2022-2023			

II. Course Description:

-This course provides an in-depth study of the clinical biochemistry. Topics include clinical enzymology, clinical hematology, clinical lipidology, blood gases and electrolytes disorders

III. Alignment Course Intended Learning Outcomes with program outcomes

III. Course ntended Learning Outcomes (CILOs)		Referenced PILOs
A. Knowledge and Understanding: ***Upon successful completion of the course, students will be able to:***		
a1	**Understand** the basic principles of clinical biochemistry	**A1**
a2	**Describe** examples of the technologies used to measure clinical biomarkers, critique and evaluate their usage.	**A2**
B. Intellectual Skills: ***Upon successful completion of the course, students will be able to:***		
b1	**Interpret and explain** results of Clinical Biochemistry and Molecular Biology and effectively to clinicians.	B1
C. Professional and Practical Skills: ***Upon successful completion of the course, students will be able to:***		
c1	**Evaluate and compare** different diagnostic and monitoring techniques used in clinical biochemistry**.**	**C3**
D. Transferable Skills: ***Upon successful completion of the course, students will be able to:***		
d1	**Communicate** scientific concepts and findings effectively in written and oral formats	D1

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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	**Understand** the basic principles of clinical biochemistry	Lectures	Exam
a2	**Describe** examples of the technologies used to measure clinical biomarkers, critique and evaluate their usage.	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	**Interpret and explain** results of Clinical Biochemistry and Molecular Biology and effectively to clinicians	Lectures Laboratory reports Case study analysis Presentations	Exam Laboratory reports Case study analysis Presentations
C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	**Evaluate and compare** different diagnostic and monitoring techniques used in clinical biochemistry	Lectures Practical	Exam Practical
(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
D1	**Communicate** scientific concepts and findings effectively in written and oral formats	Lectures Laboratory reports Case study analysis Presentations	Exam Laboratory reports Case study analysis Presentations

Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes
1	Clinical Enzymology	- Abnormal of Plasma enzymes in diseases .kidney diseases, liver, heart, and malignancy - Variation of enzymes result and factors affecting the results.	2	4	a1,a2,b1,c3,d1
2	Clinical hematology	Luekemia, anemia, myloma, Coagulopatheis, haemochromatosism, myloploroliferatives	3	6	a1,a2,b1,c3,d1
3	Blood gases	Types of blood gases (O2), (CO), (H2S), (CH4	1	2	a1,a2,b1,c3,d1
4	Clinical lipidology	Advanced Lipoprotein Metabolism and Genetic disorders, exchang of apolipoproteins, factors affecting plasmaLDL, LCAT and ACAT system, clinical manifestation of hyperlipidaemia. Obesity, Diabetes Mellitus, and the Metabolic Syndrome	3	6	a1,a2,b1,c3,d1
5	Disorders of Electrolytes	Body water, sodium, potassium, acid base balance and their pathophysiology Role of kidneys in homeostasis	2	4	a1,a2,b1,c3,d1
6	Disorders of GIT	Gastric and peptic ulcer. Acute and chronic pancreatitis, malapsorbtion	2	4	a1,a2,b1,c3,d1
7	Final exam		1	2	a1,a2,b1,c3,d1
Number of Weeks /and Units Per Semester			16	**32**	

B - Practical Aspect: (if any)				
Order	**Tasks/ Experiments**	**Number of Weeks**	**contact hours**	**Learning Outcomes**
1	**Introduction to diagnostic techniques of tumors**	**3**	**6**	a1,a2,b1,c3,d1
2	**Diagnostic test for heart and liver diseases**	**3**	**6**	a1,a2,b1,c3,d1
3	**ELISA techniques**	**2**	**4**	a1,a2,b1,c3,d1
Number of Weeks /and Units Per Semester				

V. Teaching Strategies of the Course:	
1-	Lectures
2-	Practical session
3-	Self leaning
4-	**Group discussion**
	Case study analysis

VI. Assessment Methods of the Course:	
No	**Assignment**
1	**Written Exams (Essays) and Quizzes**
2	Structured Oral Exams
4	Objective Structured Practical Exams (OSPE)
5	Student presentation
6	Case study analysis

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VII. Assignments:

No.	Assignments	Week Due	Mark	Proportion of Final Assessment	Aligned CILOs (symbols)
2	**Activity**	Throughout the semester	10	10%	a1,a2,b1,c3,d1
3	Practical Report	Throughout the semester	10	10 %	a1,a2,b1,c3,d1
4	**Practical exam**	12	20	20%	a1,a2,b1,c3,d1
5	**Final Exam**	14	60	60%	a1,a2,b1,c3,d1
Total					

Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

Clinical Biochemistry: An Integrated Approach, 7th Edition by William M. Brown and David A. Marks

Clinical Chemistry: A Laboratory Handbook, 7th Edition by John W. Baynes and Michael J. Dominiczak

2- Essential References.

Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 6th Edition by Burt Hirschhorn and Robert A. McPherson

Devlin's Textbook of Biochemistry with Clinical Correlations : Martin D. Snider John Wiley & Sons, Incorporated, Oct 9, 2024 - 1448 pages

Wep

1- http://www.biology.arizona.edu/biochemistry/biochemistry.html

2- **GENERAL BIOCHEMISTRY:**
http://web.indstate.edu:80/thcme/mwking/

3- **MEDICAL BIOCHEMISTRY**
http://www.kumc.edu/research/medicine/biochemistry/bioc800/opening.html

4- https://pubmed.ncbi.nlm.nih.gov/

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XI. *Course Policies:*	
1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** -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:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	**Forgery and Impersonation:** Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration