

Republic of Yemen
Ministry of Higher Education & Scientific Research
21 September University of Medicals and Applied Sciences



Faculty of Clinical Pharmacy

Bachelor of Clinical Pharmacy & Pharm. D.

Course Specification of

Biochemistry II

Course Code. (03.01.213)

2022



T4: This Template is Developed and Approved by CAQA-Yemen, 2023

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Dr. Ebtesam Al- Zabedi	Dr. Ghamdan AL-Tahish	Dr. -----	Dr. Abdulelah Thabet	Dr. Ali Alyahawi

I. General Information:

1.	Course Title:	Biochemistry II			
2.	Course Code:	03.01.213			
3.	Credit Hours:	Credit Hours	Theory Contact Hours		Practical Contact Hours
			Lecture	Tutorial/Seminar	Lab
		3	2		2
4.	Level/ Semester at which this Course is offered:	2 nd Level/ 2 nd Semester			
5.	Pre –Requisite (if any):	Biochemistry I			
6.	Co –Requisite (if any):				
7.	Program (s) in which the Course is Offered:	Bachelor of Clinical Pharmacy & Pharm. D.			
8.	Language of Teaching the Course:	English			
9.	Location of Teaching the Course:	Faculty of Clinical Pharmacy			
10.	Prepared by:	Dr. Ebtesam Al-Zabedi			
11.	Date and Number of Approval by Council:	2022			

II. Course Description:

This subject shall give information about all the major metabolic pathways occurring in our body. The students will learn the details about metabolism of carbohydrates, proteins, lipids, nucleic acids, enzymes & the deficiency diseases related to them.

III.Course Intended Learning Outcomes (CILOs) : Upon successful completion of the course, students will be able to:		Referenced PILOs	
A. Knowledge and Understanding:		I, P or M/A	
a1	Define the related metabolic disorders and their clinical prints on biochemical and molecular basis		<u>A1</u>
a2	Describe the metabolic pathways of carbohydrates, lipids, proteins and nucleotides.		A1
B. Intellectual Skills:			
b1	Correlate causes, mechanisms and effects of diseases based on knowledge of metabolism		B1
b2	Interpret symptoms, signs, biochemical laboratory finding of some metabolic disorders		B1
C. Professional and Practical Skills:			
c1	Perform clinical laboratory tests commonly encountered in metabolic pathway		C1
D. Transferable Skills:			
d1	Use information technology in laboratory medicine and scientific research.		D3
I= Introduced, P=Practiced or M/A= Mastered/Advanced			

(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:		
Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
a1	Define the related metabolic disorders and their clinical prints on biochemical and molecular basis	- Exam - Assignment - Quiz
a2	Describe the metabolic pathways of carbohydrates, lipids, proteins and nucleotides.	- Exam - Assignment - Quiz
(B) Alignment of Course Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods:		
Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies

b1	Correlate causes, mechanisms and effects of diseases based on knowledge of metabolism	- Lecture - Instructor – student Interactive - Exercises - Solving Problem Methods	- Problem-Solving Exercises. - Assignment - Quiz
b2	Interpret symptoms, signs, biochemical laboratory finding of some metabolic disorders	- Lecture - Instructor – student Interactive - Exercises - Solving Problem Methods	- Problem-Solving Exercises. - Assignment - Quiz
(C) Alignment of Course Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods:			
	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
c1	Perform clinical laboratory tests commonly encountered in metabolic pathway	- Lecture - Instructor – student Interactive - Self-Learning	- Exam - Assignment - Quiz
(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:			
	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
d1	Use information technology in laboratory medicine and scientific research	- Self-Learning - Seminar - Exercises	- Presentation - Assignment - Quiz

IV. Course Contents:

A. Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact Hours
1	Protein Metabolism	a1 ,b1,a2	(a) Introduction, metabolism Importance, Classification of proteins (b) Digestion & absorption of Proteins (c) Protein synthesis (d) Metabolism of proteins & amino acids , transamination (e) Disorders of Proteins metabolism and urea cycle	4	10
2	Nucleic Acid Metabolism	a1 ,b1, b2	a) Introduction (b) Functions of nucleic acid (c) functions of energy carriers d) synthesis of nitrogen base	2	4

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Dr. Abdulalah Thabet

Dr. Ali Alyahawi

	Med term Exam	a1, a2, b1, b2, c1		1	2
3	Carbohydrate Metabolism	a1, a2, b1	a) Carbohydrate Metabolism (b) Digestion and absorption (c) Metabolism: - Glycolysis, Citric acid cycle, d) glycogen metabolism (Gluconeogenesis, Glycogenolysis, Glycogenesis) e) Disorders of carbohydrate metabolism ,hypo &hyperglycemia	4	10
4	Lipids	a 1, b1, a2, d1	(a) Introduction & Classification (b) Digestion & absorption of fats © Lipoproteins (d) Fatty acid biosynthesis & fatty acid oxidation -Cholesterol biosynthesis -ketone bodies (formation ,utilization, and oxidation) - cholesterol metabolism	4	8
5	Final Theoretical Exam	a1, a2, b1, b2, c1, d1		1	2
Number of Weeks /and Units Per Semester				16	32

B. Practical Aspect (Lab/Clinical) (if any):

No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	Introduction of lab instrument	1	2	a1, a2, b1, b2, c1
2	Estimation of protein in serum	2	4	c1,d1
3	Estimation of creatinine	2	4	c1,d1
	Med term Exam	1	2	c1,d1

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No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
4	Estimation of uric acid	2	4	c1,d1
5	Estimation of urea	2	4	c1,d1
6	Estimation of glucose	2	4	c1,d1
7	Lipid profile in serum or plasma (Cholesterol, triglycerides, Esterified cholesterol)	3	6	c1,d1
8	Final practical exam	1	2	a1, a2, c1,d1
Number of Weeks /and Units Per Semester		16	36	

C.Tutorial Aspect (if any):

No.	Tutorial	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	NA			
2				
Number of Weeks /and Units Per Semester				

VII.Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1	Assignments1	6th,	2.5	a1, a2, b1, b2, c1
2	Assignment2	12th	2.5	a1, a2, b1, b2, c1
Total				5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	6th, 12th	5	5%	a1, a2, b1, b2, c1
2	Practical Reports	2 nd -13 th	5	5%	a1, a2, b1, b2, c1

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3	Midterm Exam (Theory)	Week 7	20	20%	a1, a2, b1, b2
4	Final Practical Exam	14 th	20	15%	a1, a2, c1
5	Final Exam (Theory)	Week 16	50	50%	a1, a2, b1, b2, c1
Total			100	100%	

IX. Learning Resources:

1- Required Textbook(s):

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

2- Essential References.

Biochemical Journal (<https://portlandpress.com/biochemj>)

3- Electronic Materials and Web Sites etc.

<https://www.ncbi.nlm.nih.gov/pubmed/>

The medical biochemistry page (online textbook) : <https://themedicalbiochemistrypage.org/>

X. Course Policies: (Based on the Uniform Students' By law (2007))

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: A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
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.

Faculty of Clinical Pharmacy

Bachelor of Clinical Pharmacy & Pharm. D.

Course Plan (Syllabus) of **Biochemistry II**

Course Code. 03.01.213

I.Information about Faculty Member Responsible for the Course:						
Name of Faculty Member:	Dr. Ebtesam Al- Zabedi			Office Hours		
Location& Telephone No.:						
E-mail:				SAT	SUN	MON TUE WED THU

2022- 2023

II. Course Identification and General Information:

11.	Course Title:	Biochemistry II			
12.	Course Code:	03.01.213			
13.	Credit Hours:	Credit Hours	Theory Contact Hours		Practical Contact Hours
			Lecture	Tutorial /Seminar	Lab
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14.	Level/ Semester at which this Course is offered:	2 nd Level/ 2 nd Semester			
15.	Pre –Requisite (if any):	Biochemistry I			
16.	Co –Requisite (if any):				
17.	Program (s) in which the Course is Offered:	Bachelor of Clinical Pharmacy & Pharm. D.			
18.	Language of Teaching the Course:	English			
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IV. Course Intended Learning Outcomes (CILOs) :

Upon successful completion of the Course, student will be able to:

A. Knowledge and Understanding:

- a1 **Define** the related metabolic disorders and their clinical prints on biochemical and molecular basis
- a2 **Describe** the metabolic pathways of carbohydrates, lipids, proteins and nucleotides.

B. Intellectual Skills:

- b1 **Correlate** causes, mechanisms and effects of diseases based on knowledge of metabolism
- b2 **Interpret** symptoms, signs, biochemical laboratory finding of some metabolic disorders

C. Professional and Practical Skills:

- c1 **Perform** clinical laboratory tests commonly encountered in metabolic pathway

D. Transferable Skills:

- d1 Use information technology in laboratory medicine and scientific research.

V. Course Contents:

A. Theoretical Aspect:

خطأ! لم يتم العثور على مصدر المرجع.

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact Hours
1	Protein Metabolism	a1 ,b1,a2	(a) Introduction, metabolism Importance, Classification of proteins (b) Digestion & absorption of Proteins (c) Protein synthesis (d) Metabolism of proteins & amino acids , transamination (e) Disorders of Proteins metabolism and urea cycle	4	10
2	Nucleic Acid Metabolism	a1 ,b1, b2	a) Introduction (b) Functions of nucleic acid (c) functions of energy carriers (d) synthesis of nitrogen base	2	4
	Med term Exam	a1, a2, b1, b2, c1		1	2

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3	Carbohydrate Metabolism	a1, a2, b1	a) Carbohydrate Metabolism (b) Digestion and absorption (c) Metabolism: - Glycolysis, Citric acid cycle, d) glycogen metabolism (Gluconeogenesis, Glycogenolysis, Glycogenesis) e) Disorders of carbohydrate metabolism ,hypo &hyperglycemia	4	10
4	Lipids	a 1, b1, a2, d1	(a) Introduction & Classification (b) Digestion & absorption of fats © Lipoproteins (d) Fatty acid biosynthesis & fatty acid oxidation -Cholesterol biosynthesis -ketone bodies (formation ,utilization, and oxidation) - cholesterol metabolism	4	8
5	Final Theoretical Exam	a1, a2, b1, b2, c1, d1		1	2
Number of Weeks /and Units Per Semester				16	32
No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)	
1	Introduction of lab instrument	1	2	a1, a2, b1, b2, c1	
2	Estimation of protein in serum	2	4	c1,d1	
3	Estimation of creatinine	2	4	c1,d1	
	Med term Exam	1	2	c1,d1	
4	Estimation of uric acid	2	4	c1,d1	
5	Estimation of urea	2	4	c1,d1	
6	Estimation of glucose	2	4	c1,d1	
7	Lipid profile in serum or plasma	3	6	c1,d1	

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	(Cholesterol, triglycerides, Esterified cholesterol)			
8	Final practical exam	1	2	a1,a2, c1,d1
Number of Weeks /and Units Per Semester		16	36	

VI.Teaching Strategies of the Course:

- Lecture
- Instructor – student Interactive
- Exercises
- Presentation
- Office hours
- Seminar
- Assignment
- Self-Learning

VII.Assessment Methods of the Course:

خطأ! لم يتم العثور على مصدر المرجع.

- Assignments
- Quiz
- Exam
- Oral Presentation

VIII. Assignments:

No.	Assignments	Week Due	Mark
1	Assignments1	6th,	2.5
2	Assignment2	12th	2.5
Total			

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
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Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UMAS



الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي

جامعة 21 سبتمبر للعلوم الطبية والتطبيقية

كلية الصيدلة السريرية

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	Midterm Exam (Practical)	Week 7	10	10%	a1, a2, c1
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