

Course Syllabus

1	Course title	Biochemistry	
2	Course number	0304321	
3	Credit hours	4	
	Contact hours (theory, practical)	3+1	
4	Prerequisites/corequisites	Organic Chemistry 0333233	
5	Program title	BSc	
6	Program code	0304	
7	Awarding institution	University of Jordan	
8	School	Science	
9	Department	Biology	
10	Course level	3 rd Year	
11	Year of study and semester(s)	First and second semester 2023/2024	
12	Other department(s) involved in teaching the course	None	
13	Main teaching language	English	
14	Delivery method	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	Online platforms(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others...	
16	Issuing/Revision Date	1-10-2023	

17 Course Coordinator:

Name: Dr. Tareq Alhindi

Office number: Biology Building 315

Phone number: 22218

Email: t.alhindi@ju.edu.jo

Contact hours: Any time with prior appointment

**18 Other instructors:**

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19 Course Description:

As stated in the approved study plan.

As stated in the approved study plan. Introduction to the basic concepts in biochemistry. A detailed discussion of the chemistry of water, acids, bases and buffers. Basic techniques to purify macromolecules especially proteins.

Structural organization and building blocks of proteins. Enzymes: their classification, function and kinetics. Regulation of enzyme activity. An over view of carbohydrates and lipids.

20 Course aims and outcomes:

A- Aims:

1. Understanding of acids, bases, water and buffers.
2. Understanding of protein purification methods, protein structure and properties.
3. Understanding of enzymes and enzymatic reactions.
4. Understanding of carbohydrates and lipids types and properties.

B- Course Learning Outcomes (CLOs):

Upon successful completion of this course, students will be able to:

- 1- Solve problems dealing with buffers.
- 2- Classify the amino acids according to their properties.
- 3- Understand the concepts of proteins folding and proteins structural levels.
- 4- Understand the basic principles of protein purification methods and basic protein assays.
- 5- Distinguish the concept of enzyme function and the various types of enzyme inhibition.
- 6- Classify lipids and recognize their properties.
- 7- Explore the various types of carbohydrates.

SLOs	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)	SLO (6)
CLOs of the course						
1	x		x		x	
2	x		x		x	
3	x					
4	x		x		x	
5	x					
6	x		x		x	
7	x		x		x	

21. Topic Outline and Schedule:

Week	Lecture	Topic	Course Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Introduction						
	1.2	Water and Polarity	1					
	1.3	Hydrogen Bonds	1					
2	2.1	Acids and Bases	1				Reports	
	2.2	The pH	1				Quiz	
	2.3	Titration Curves	1				Reports	
3	3.1	Buffers	1				Reports	
	3.2	Amino Acids Are Three-Dimensional	2					
	3.3	Structures and Properties of Amino Acids	2				Quiz	
4	4.1	Amino Acids Can Act as Both Acids and Bases	2				Reports	
	4.2	The Peptide Bond	2					
	4.3	Small Peptides with Physiological Activity	3					
5	5.1	Protein Structure and Function	3					
	5.2	Primary Structure of Proteins	3					
	5.3	Secondary Structure of Proteins	3					

6	6.1	Tertiary Structure of Proteins	3					
	6.2	Quaternary Structure of Proteins	3					
	6.3	Protein-Folding Dynamics	3					
7	7.1	Midterm Exam					Written exam	
	7.2	Extracting Pure Proteins from Cells	4				Reports	
	7.3	Extracting Pure Proteins from Cells	4					
8	8.1	Column Chromatography	4					
	8.2	Electrophoresis	4					
	8.3	Determining the Primary Structure of a Protein	4					
9	9.1	Protein Detection Techniques	4					
	9.2	Protein Detection Techniques	4					
	9.3	Proteomics	4					
10	10.1	Enzyme Kinetics vs. Thermodynamics	5				Reports	
	10.2	Enzyme Kinetics vs. Thermodynamics	5					
	10.3	Rate of Enzyme-Catalysed Reactions	5					
11	11.1	Rate of Enzyme-Catalysed Reactions	5				Reports	
	11.2	Enzyme-Substrate Binding	5					

	11.3	The Michaelis–Menten Approach to Enzyme Kinetics	5					
12	12.1	The Michaelis–Menten Approach to Enzyme Kinetics	5					
	12.2	Examples of Enzyme-Catalyzed Reactions	5					
	12.3	Enzyme Inhibition	5					
13	13.1	The Definition of a Lipid	6					
	13.2	The Chemical Natures of the Lipid Types	6					
	13.3	Biological Membranes	6					
14	14.1	The Functions of Membranes proteins	6					
	14.2	Lipid-Soluble Vitamins and Their Functions	6					
	14.3	Sugars: Their Structures and Stereochemistry	7					
15	15.1	Reactions of Monosaccharides	7				Reports	
	15.2	Some Important Oligosaccharides	7				Reports	
	15.3	Structures and Functions of Polysaccharides	7					

22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Laboratory reports and quizzes	20		1-3	weekly	
Mid. term exam	30		1,2	7	
Final Exam	50		1,2	16	

23 Course Requirements

(e.g: students should have a computer, internet connection, webcam, account on a specific software/platform...etc): A PC or new smartphone with MS Teams installed and an adequate internet connection; a suitable internet browser to open the Moodle webpage E-learning.

24 Course Policies:

A- Attendance policies:

Enrolled students are expected to attend the lectures in line with the university of Jordan policy as outlined in the JU student handbook. Failure to do so will make the student subject to the penalties outlined in the said document. Furthermore, missing classes will have negative repercussions on the student's participation grade.

B- Absences from exams and submitting assignments on time:

You should talk to your instructor as soon as possible if you miss an exam. All such cases will be dealt with according to the UJ student handbook rules.

C- Health and safety procedures:

To be announced during laboratory introduction as explained in the laboratory manual.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

All violations pertaining to cheating, plagiarism and misbehavior will be dealt with in accordance to the rules outlined in the UJ student handbook. In order to avoid plagiarism, the sources for the information contained in your homework must be properly cited and verbatim quotations must be limited and explicitly presented as such. To learn more about the procedures for ethical referencing of information and how to assess the credibility of information critically you can consult with the relevant documents in the course UJ e-learning page (see below).

E- Grading policy:

Evaluation	Points %	Date
Midterm Exam	30%	TBA
Laboratory Reports and Quiz	20%	TBA
Final Exam	50%	TBA

F- Available university services that support achievement in the course:

Moodle course page at University of Jordan e-learning portal: <https://elearning.ju.edu.jo/>

25 References:

A- Required book(s), assigned reading and audio-visuals:

1. "Biochemistry, 9th Edition" by Mary K. Campbell, et al. © 2017. ISBN-13: 978-1305961135.

B- Recommended books, materials and media:

"Lehninger Principles of Biochemistry, 7th Edition" by David L. Nelson; Michael M. Cox. © 2017. ISBN:9781464126116.

Recommended videos announced during the course available on YouTube or other platforms.

26 Additional information:

Name of Course Coordinator: Dr. Tareq Alhindi---Signature: ----- Date: 1.10.2023-----
Head of Curriculum Committee/Department: ----- Signature: -----
Head of Department: ----- Signature: -----
Head of Curriculum Committee/Faculty: ----- Signature: -----
Dean: ----- Signature: -----