

Course E-Syllabus

1	Course title	Biochemistry
2	Course number	0334321
3	Credit hours	3+1
	Contact hours (theory, practical)	3+3
4	Prerequisites/corequisites	Organic Chemistry 0333233
5	Program title	B.Sc. in Biological Sciences
6	Program code	0304
7	Awarding institution	University of Jordan
8	School	Faculty of Sciences
9	Department	Biological Sciences
10	Level of course	Senior (3ed year)
11	Year of study and semester (s)	First and Second semesters 2020-2021
12	Final Qualification	B.Sc. in Biological Sciences
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Teaching methodology	<input type="checkbox"/> Blended <input checked="" type="checkbox"/> Online
16	Electronic platform(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input checked="" type="checkbox"/> Others... Facebook & YouTube
17	Date of production/revision	Oct 08, 2020

18 Course Coordinator:

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Name:
Office number:
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20 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.

21 Course aims and outcomes:

A- Aims:

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

B- Intended Learning Outcomes (ILOs):

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

- 1- Characterize aqueous solutions especially buffers.
- 2- Solve problems dealing with buffers.
- 3- Discriminate between buffered and unbuffered solutions.
- 4- List the various techniques involved in protein purification.
- 5- Understand the basic principles of protein purification methods.
- 6- Discriminate between the different of protein purification.
- 7- Classify the various chromatographic and electrophoretic methods.
- 8- Recognize the various amino acids.
- 9- Identify the various side chains of amino acids.
- 10- Classify the amino acids according to their properties.
- 11- Distinguish the side chains of amino acids.
- 12- Describe the primary structure of proteins.
- 13- Determine the secondary structure of proteins.
- 14- List the tertiary structural elements of proteins.
- 15- Clarify the concept of the quaternary structure of proteins.
- 16- Classify enzymes according to the enzyme commission rules.
- 17- Distinguish the concept of enzyme function.
- 18- Contrast the various types of enzyme inhibition.
- 19- List the various types of enzyme catalysis.
- 20- Explain the mechanisms of enzyme regulation.
- 21- Explore the various types of carbohydrates.
- 22- Classify lipids and recognize their properties.

22. Topic Outline and Schedule:

Week	Lecture	Topic	Teaching Methods*/platform	Evaluation Methods**	References
1	1.1	Introduction	MS Teams		
	1.2	Water and Polarity	MS Teams		
	1.3	Hydrogen Bonds	MS Teams		
2	2.1	Acids and Bases	MS Teams	Homework	
	2.2	The pH	MS Teams	Homework	
	2.3	Titration Curves	MS Teams	Homework	
3	3.1	Buffers	MS Teams	Quiz	
	3.2	Amino Acids Are Three-Dimensional	MS Teams		
	3.3	Structures and Properties of Amino Acids	MS Teams		
4	4.1	Amino Acids Can Act as Both Acids and Bases	MS Teams	Homework	
	4.2	The Peptide Bond	MS Teams		
	4.3	Small Peptides with Physiological Activity	MS Teams		
5	5.1	Protein Structure and Function	MS Teams		
	5.2	Primary Structure of Proteins	MS Teams		
	5.3	Secondary Structure of Proteins	MS Teams		
6	6.1	Tertiary Structure of Proteins	MS Teams		
	6.2	Quaternary Structure of Proteins	MS Teams		
	6.3	Protein-Folding Dynamics	MS Teams		
7	7.1	Midterm Exam	Moodle	Exam	
	7.2	Extracting Pure Proteins from Cells	MS Teams	Homework	
	7.3	Extracting Pure Proteins from Cells	MS Teams	Homework	
8	8.1	Column Chromatography	MS Teams		
	8.2	Electrophoresis	MS Teams		

	8.3	Determining the Primary Structure of a Protein	MS Teams		
9	9.1	Protein Detection Techniques	MS Teams	Reports	
	9.2	Protein Detection Techniques	MS Teams	Reports	
	9.3	Proteomics	MS Teams		
10	10.1	Enzyme Kinetics vs. Thermodynamics	MS Teams	Reports	
	10.2	Enzyme Kinetics vs. Thermodynamics	MS Teams	Reports	
	10.3	Rate of Enzyme-Catalysed Reactions	MS Teams	Reports	
11	11.1	Rate of Enzyme-Catalysed Reactions	MS Teams	Reports	
	11.2	Enzyme-Substrate Binding	MS Teams		
	11.3	The Michaelis-Menten Approach to Enzyme Kinetics	MS Teams	Quiz	
12	12.1	The Michaelis-Menten Approach to Enzyme Kinetics	MS Teams	Quiz	
	12.2	Examples of Enzyme-Catalyzed Reactions	MS Teams		
	12.3	Enzyme Inhibition	MS Teams	Quiz	
13	13.1	The Definition of a Lipid	MS Teams	Reports	
	13.2	The Chemical Natures of the Lipid Types	MS Teams	Reports	
	13.3	Biological Membranes	MS Teams	Reports	
14	14.1	The Functions of Membranes proteins	MS Teams	Reports	
	14.2	Lipid-Soluble Vitamins and Their Functions	MS Teams	Reports	
	14.3	Sugars: Their Structures and Stereochemistry	MS Teams	Reports	

15	15.1	Reactions of Monosaccharides	MS Teams	Reports	
	15.2	Some Important Oligosaccharides	MS Teams	Reports	
	15.3	Structures and Functions of Polysaccharides	MS Teams	Reports	

- Teaching methods include: Synchronous lecturing/meeting; Asynchronous lecturing/meeting
- Evaluation methods include: Homework, Quiz, Exam, pre-lab quiz...etc

23 Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	Period (Week)	Platform
Midterm Exam	30		TBA	Moodle
Laboratory Reports	10		Weekly	E-mail
Laboratory quizzes	10		Weekly	Moodle
Reports	10		TBA	E-mail
Final Exam	40		TBA	Moodle

24 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 and JU Exams, and to access Facebook to follow course group.

25 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 Exams	30%	TBA
Final Exam	40%	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/>

26 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.

27 Additional information:

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Name of Course Coordinator: ---- Dr. Tareq Alhindi ----- Signature: ----- Date: -----

Head of Curriculum Committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of Curriculum Committee/Faculty: ----- Signature: -----

Dean: ----- Signature: -----