Jordan University of Science and Technology

Faculty of Science & Arts

Biotechnology & Genetic Engineering Department

BT351 Biochemistry - JNQF Level: 7

First Semester 2024-2025

Course Catalog
3 Credit Hours. Course Description: the course aims to provide the students with a comprehensive overview of the structure, properties, function and metabolism of biomolecules: proteins, lipids, carbohydrates and nucleic acids. Students will learn about the the relationship between protein structure and its biological function, enzyme kinetics, generation and storage of metabolic energy, major metabolic pathways and their interconnection into tightly regulated networks, the manipulation of enzymes and pathways with mutations or drugs, integration of metabolism and demonstrating the relevance of biochemistry to human health and disease through the clinical and biological insights.
Teaching Method: On Campus

Text Book	
Title	Biochemistry
Author(s)	M.K.Campbell, S. O. Farrell and O. M. McDougal
Edition	9th Edition
Short Name	Text book
Other Information	2018. Cengage Learning, Inc. UK.

Course References

Short name	Book name	Author(s)	Edition	Other Information
Reference #1	Biochemistry: A Short Course	John L. Tymoczko, Jeremy M. Berg, Gregory J. Gatto Jr. and Lubert Stryer	4th Edition	2019. Macmillan Learning Inc. USA.

Instructor	
Name	**Prof. Nisreen Al-Quraan**
Office Location	PH1-L0
Office Hours	
Email	naquraan@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Mon, Wed : 08:30 - 10:00 Room: SF06

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
912170	CHEM217 Organic Chemistry	Prerequisite / Study
822170	HSS217CHEM Organic Chemistry	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Water: The Solvent for Biochemical Reactions	**Chapter 2** From **Text book**, From **Reference #1**
Week 2	Amino Acids and Peptides	**Chapter 3** From **Text book**, From **Reference #1**
Week 3	The Three-Dimensional Structure of Proteins	**Chapter 4** From **Text book**, From **Reference #1**
Week 4	The Behavior of Proteins: Enzymes	**Chapter 6** From **Text book**, From **Reference #1**
Week 5	The Behavior of Proteins: Enzymes, Mechanisms, and Control	**Chapter 7** From **Text book**, From **Reference #1**
Week 6	Lipids and Proteins are Associated in Biological Membranes	**Chapter 8** From **Text book**, From **Reference #1**
Week 7	The Importance of Energy Changes and Electron Transfer in Metabolism	**Chapter 15** From **Text book**, From **Reference #1**
Week 8	Carbohydrates	**Chapter 16** From **Text book**, From **Reference #1**
Week 9	Glycolysis	**Chapter 17** From **Text book**, From **Reference #1**
Week 10	Storage Mechanisms and Control in Carbohydrate Metabolism	**Chapter 18** From **Text book**, From **Reference #1**
Week 11	The Citric Acid Cycle	**Chapter 19** From **Text book**, From **Reference #1**
Week 12	Electron Transport and Oxidative Phosphorylation	**Chapter 20** From **Text book**, From **Reference #1**
Week 13	Lipid Metabolism	**Chapter 21** From **Text book**, From **Reference #1**

Week 14	The Metabolism of Nitrogen	**Chapter 23** From **Text book**, From **Reference #1**
Week 15	Integration of Metabolism: Cellular Signaling	**Chapter 24** From **Text book**, From **Reference #1**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Describe the biochemistry of water as solvent for biochemical reactions, amino acids and peptides, the three-dimensional structure of proteins, and the behavior of proteins: enzymes, mechanisms, and control. [5SLO1] [1L7K1]	25%	Midterm Exam, Quizzes
Discuss the structures and functions of lipids and proteins in biological membranes, the importance of energy changes and electron transfer in metabolism, carbohydrates, glycolysis pathway and its importance in sugar metabolism. [3SLO1, 2SLO4] [1L7K1]	25%	Midterm Exam, Quizzes
Explain the function of citric acid cycle as a central pathway in cellular catabolism and the electron transport and oxidative phosphorylation in energy harvesting from complete oxidation of glucose. [1SLO1, 1SLO4] [1L7K1]	15%	Quizzes, Final Exam
Describe the lipid metabolism in the generation and storage of energy and the synthesis of lipid compounds, the nitrogen fixation and the metabolism of nitrogen containing compounds: amino acids, purines and pyrimidines. [1SLO1, 1SLO4] [1L7K1]	20%	Quizzes, Final Exam
Describe and explain the integration of metabolism in term of cellular signaling in nutrition, hormones and second messengers, hormones and control of metabolism and the connections between metabolic pathways. [1SLO1, 1SLO4] [1L7K1, 1L7S2]	15%	Final Exam

Relationship to Program Student Outcomes (Out of 100%)					
SLO1	SLO2	SLO3	SLO4	SLO5	SLO6
65			35		

Relationship to NQF Outcomes (Out of 100%)	
L7K1	L7S2
92.5	7.5

Evaluation	
Assessment Tool	**Weight**
Midterm Exam	40%
Quizzes	20%
Final Exam	40%

Policy

Class Materials	All class chapters PDF and PPT, class announcements, Online meetings and discussion, and Exams ADDs will be posted on the Eleraning system. Students are responsible for ALL class materials presented or assigned on Eleraning system.
Attendance	Students are expected to attend classes. Consequently, students are responsible for ALL material presented or assigned during the scheduled class period and are expected to obtain such information on their own should a class period be missed. Whenever possible, absences will be discussed with the instructor in advance. Class attendance will be taken in lecture. Students will be allowed three absences between every mid-term exam, and a total of six absences before the final. Absences in excess of that stated above will result in the student failing in the course.
Policy on academic dishonesty and Make-up examinations	JUST regulations and rules will be strictly implemented. Refer to University's student information book for more details about exams, exam make up and absence rules; If you are absent from one or more of your examinations for medical or other reasons, you must provide documentary evidence to justify your absence for the consideration of a make up exam within one week or else no make up exam will be permitted.
Evaluation	Midterm Exam 40% Quizzes 20% Final Exam 40% Total 100%
General Policies	1. Your class attendance is mandatory. Absences in excess of 20% of the total lecture hours will result in your being dropped from the course with a failing grade. 2. Make-up exam appeals should be filed within two days of the missed exam. 3. Cell phones are prohibited during examinations and must be turned off during lecture. No incoming or outgoing calls or text messages are allowed. 4. Unethical conduct, including cheating during examinations, will result in punishment by the university administration according to JUST punishment rules. 5. Quizzes will be posted on E-learning and if you missed any Quiz your grade will be marked Zero in that Quiz.

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