



Jordan University of Science and Technology
Faculty of Science & Arts
Applied Biological Sciences Department

BIO741 Biochemistry

First Semester 2017-2018

Course Catalog

3 Credit Hours. The course is meant to be an advanced course, requiring a certain degree of independence in reading and critical thinking. The course builds on principles covered in undergraduate-level biochemistry and its goal is to expand graduate student's knowledge of protein structure and function

Text Book

Title	Fundamentals of Biochemistry: Life at the Molecular Level
Author(s)	Donald Voet, Judith Voet, and Charlotte W. Pratt
Edition	5th Edition
Short Name	1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
2	Primary Research Articles	To be determined	1st Edition	

Instructor

Name	Dr. Qutaiba Ababneh
Office Location	PH1L1
Office Hours	Sun : 08:30 - 10:00 Mon : 08:30 - 10:00 Tue : 09:00 - 10:30 Wed : 11:30 - 13:00
Email	qoababneh@just.edu.jo

Class Schedule & Room

Section 1:

Lecture Time: Mon, Wed : 13:00 - 14:30

Room: NG42

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Thermodynamics	From 1
Week 2	Ionization equilibria, pH, water and weak interactions	From 1
Week 3	Protein Structure	From 1, From 2
Week 4	Protein folding	From 1, From 2
Week 5	Protein Function: Binding & Allostery	From 1, From 2
Week 6	Protein Function: Enzymatic Catalysis	From 1
Week 7	Protein Function: Enzyme Kinetics, Inhibition and Control	From 1, From 2
Week 8	Introduction to Metabolism and carbohydrates	From 1
Week 9	Glycolysis	From 1, From 2
Week 10	Pentose Phosphate Pathway, Glycogen Metabolism and Gluconeogenesis	From 1
Week 10	TCA Cycle	From 1
Week 11	Metabolic regulation	From 1, From 2
Week 13	Electron Transport and Oxidative Phosphorylation	From 1
Week 14	Lipids and Biological Membranes	From 1

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Demonstrate a deep understanding of the structural, functional, thermodynamic and kinetic features of proteins, enzymes and the protein folding process [1A]	35%	Midterm Exam
Describe the general framework of catabolic and anabolic pathways, and know the key structures, chemistry, and regulation of the reactions in these pathways [1A]	35%	Final Exam
Learn how to read, evaluate and present primary biochemical literature. [1D]	15%	Problem Sets

Analyze and interpret experimental data, and perform quantitative calculations to solve biochemical problems [1D]	15%	Research Article Discussion
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Relationship to Program Student Outcomes (Out of 100%)					
A	B	C	D	E	F
70			30		

Evaluation	
Assessment Tool	Weight
Midterm Exam	35%
Problem Sets	15%
Research Article Discussion	15%
Final Exam	35%

Policy	
Software (Required)	<p>Several of the homework questions will require the use of software packages for molecular display and data analysis. One purpose of this course is to introduce students to modern computational tools used in the quantitative study of biochemistry. You are required to learn how to use the following two software packages:</p> <p>? PyMOL is a professional-grade molecular display package used to examine molecular structures. The program is required for homework questions. The program is free to download and use for students and can be found at: http://www.pymol.org/. An introductory tutorial that will orient you to the basic use of this system can be found at: http://www.pymolwiki.org/index.php/Category:Tutorials. ?</p> <p>? Other software and tools will be needed for some of the problem set question.</p>
Problem Set	<p>It is expected that the work you do on homework is your own, original work. Copying other student's homework is not allowed and will result in a zero for students turning in very similar homework papers. Students are encouraged to discuss the homework questions and reason together through how to approach a problem, but the final work turned in must not be plagiarized from another student or source.</p>
Article Discussions	<p>For each article, two Designated Presenters (DPs) will be responsible for preparing the slides. One PD will prepare and explain the introduction and background, while the other PD is responsible for the explaining the methods.</p> <p>All students will present each article jointly. In some random order, one student will explain the first figure or table by answering the following questions:</p> <p>? What is the question of the figure/table?</p> <p>? What was the approach to answer the questions?</p> <p>? What were the results, and what did it mean?</p> <p>Then the next student will explain the next table/figure, and so on.</p>