



The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

1	Course title	Practical Biochemistry
2	Course number	1203252
3	Credit hours (theory, practical)	1(Practical)
	Contact hours (theory, practical)	45 (Practical)
4	Prerequisites/corequisites	1203251
5	Program title	BSc & PharmD
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Pharmacy
9	Department	Biopharmaceutics & Clinical Pharmacy
10	Level of course	undergraduate
11	Year of study and semester (s)	First semester of the 2 nd year
12	Final Qualification	BSc & PharmD
13	Other department (s) involved in teaching the course	NA
14	Language of Instruction	English
15	Date of production/revision	1 September 2015

16. Course Coordinator:

Dr. Violet Kasabri
E-mail: V.Kasabri@ju.edu.jo;
Office No.: 135
Office hours to be announced

17. Other instructors:

Office numbers, office hours, phone numbers, and email addresses should be listed.
 Prof. Yasser Bustanji
 E-mail: bustanji@ju.edu.jo
 Office No.: 218
Office hours to be announced
 Dr. Areej Assaf. office No 132, Office hours to be announced
 E-mail: areej_assaf@ju.edu.jo

18. Course Description:

Provides hands-on-bench and complementary practices reacted to principle information concerning the chemical and physical properties of biomolecules (carbohydrates, lipids, amino acids and proteins) and their interrelated functioning in a biological system. The topics of enzymes and relevant enzyme inhibitors are also covered

19. Course aims and outcomes:

Program Competencies Achieved:

2.2 Recognize main physiological and biochemical principles that govern normal body functioning

A- Aims:

This course is the practical course in support of a two-semester sequence in biochemistry theory. The students are expected to:

1. Demonstrate a good awareness and understanding of biochemical principles
2. Understand the main concepts regarding the chemical and physical properties of key organic molecules used by living systems (proteins, amino acids and peptides, carbohydrates, fatty acids and lipids)
3. Know the basic concepts and kinetics of enzymes, protein structure and function, regulatory strategies in enzymes, and lipids' classes.

B- Course Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to ...

Successful completion of the course should lead to the following outcomes:

A. Knowledge and Understanding: Student is expected to develop Intellectual skills (cognitive and analytical) via learning:

A1. Introduction

- Key organic molecules are used by living systems
- Weak Interactions in Aqueous Systems
- Ionization of Water, Weak Acids, and Weak Bases
- Buffering against pH Changes in Biological Systems
- Water as a Reactant

A2. Carbohydrates

- Monosaccharides Are Aldehydes or Ketones with Multiple Hydroxyl Groups
- Complex Carbohydrates Are Formed by Linkage of Monosaccharides

A3. Lipids and Cell Membranes

- Triacylglycerols Are Highly Concentrated Energy Stores
- Fatty Acids Are Key Constituents of Lipids
 - Important sterols like Cholesterol

A4. Amino acids and Protein Structure and Function

- Proteins Are Built from a Repertoire of 20 Amino Acids
- Different classes of amino acids and their identification tests and protocols
- Spectrophotometric determination of serum albumin levels
- Problems

A5. Enzymes: Basic Concepts and Kinetics

- Enzymes Are Powerful and Highly Specific Catalysts
- Free Energy Is a Useful Thermodynamic Function for Understanding Enzymes
- Enzymes Accelerate Reactions by Facilitating the Formation of the Transition State
- The Michaelis-Menten Model Accounts for the Kinetic Properties of Many Enzymes
- Enzymes Can Be Inhibited by Specific Molecules
- Enzyme inhibitors of different modes can be successful drug candidates
- V_{\max} and K_M Can Be Determined by Double-Reciprocal Plots

- Problems on competitive and non competitive enzyme inhibitors
- Substrate concentration, reaction pH and temperature can enzyme catalyzed reaction velocity

B. Intellectual skills:

- Able to handle and deal with biochemical reactions
- Able to differentiate between different macromolecules using chemical reactions
- Interpret enzymatic data and enzyme inhibition reaction

C. Subject specific skills

D. Transferable Skills: Student is expected to

1. Develop of problem solving and critical thinking skills.
2. Use oral communication to effectively transmit ideas and conclusions to a scientific audience.
3. Calculations of V_{max} and K_m in enzymatic assays. pH measurements and subsequent calculations.
4. Determinations and evaluations of concentrations of blood samples' parameters using spectrophotometry (Blood glucose, blood cholesterol and blood albumin)

Teaching Methods

Practical skills and experiments related to unknown identification and quantification and problems solving, in addition to exams.

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Orientation	1				
1. BASIC TECHNIQUES	2				
2. BUFFER SOLUTION	3		A, B, D	Exams, Quizes	Specified in each lecture. General references provided below
3. SPECTROPHOTOMETRY	4		A, B, D	Exams, Quizes	Specified in each lecture. General references provided below
4. MEASUREMENT OF PLASMA GLUCOSE	5		A, B, D	Exams, Quizes	Specified in each lecture. General references provided below
5. MEASUREMENT OF PLASMA CHOLESTEROL	6		A, B, D	Exams, Quizes	Specified in each lecture. General

					references provided below
6. IDENTIFICATION OF CARBOHYDRATES	7		A, B, D	Exams, Quizes	Specified in each lecture. General references provided below
7. DETERMINATION OF LIPIDS	8		A, B, D	Exams, Quizes	Specified in each lecture. General references provided below
8. MIDTERM EXAM [theory+ practical]	9		A, B, D	Exams, Quizes	Specified in each lecture. General references provided below
9. IDENTIFICATION OF PROTEINS AND AMINO ACIDS	10		A, B, D	Exams, Quizes	Specified in each lecture. General references provided below
10. MEASUREMENT OF TOTAL PLASMA PROTEINS AND ALBUMIN	11		A, B, D	Exams, Quizes	Specified in each lecture. General references provided below
11. ENZYMES and ENZYME INHIBITORS	12		A, B, D	Exams, Quizes	Specified in each lecture. General references provided below
12. FINAL EXAM [theory + practical]	13		A, B, D	Exams, Quizes	Specified in each lecture. General references provided below

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following <u>teaching and learning methods</u> :		
ILO/s	Learning Methods	Evaluation Methods
	Lectures	Exams, Quizzes
	Assignments	Practical Exam and Evaluation of Practical skills using a practical evaluation sheet
	Discussions AND Video simulations	

Learning skills:

1. Critical thinking
2. Problem solving skills

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment

methods and requirements:

1. Exams,
2. Quizzes
3. Practical Exam and Evaluation of Practical skills using a practical evaluation sheet

23. Course Policies:

A- Attendance policies:

Attendance: Mandatory.

University regulations will be applied

B- Absences from exams and handing in assignments on time:

University regulations will be applied

C- Health and safety procedures:

NA

D- Honesty policy regarding cheating, plagiarism, misbehavior:

The participation, the commitment of cheating will lead to applying all following penalties together

- 1) Failing the subject he/she cheated at
- 2) Failing the other subjects taken in the same course
- 3) Not allowed to register for the next semester. The summer semester is not considered as a semester

E- Grading policy:

Exams and Quizzes.

Mid Exam:	40 points
Quizz:	10 points
Final Exam:	50 points
Total	100 points

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

Classrooms, internet classes

24. Required equipment:

Data show and internet connection

25. References:

ISBN	Title	Author	Year
	Lab Manual		
781769604	BIOCHEMISTRY LIPPINCOTT'S ILLUSTRATED REVIEWS, 4TH EDITION	CHAMPE, PAMELA; HARVEY, RICHARD; FERRIER, DENISE; COOPER, MICHAEL	2008C
7167743396	LEHNINGER PRINCIPLES OF BIOCHEMISTRY	LEHNINGER, ALBERT	2005C

26. Additional information:

--

Name of Course Coordinator: Yasser Bustanji -Signature: ----- Date: Jan, 31, 2016

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: Nailya Bulatova Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

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

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File