Jordan University of Science and Technology

Faculty of Science & Arts

Biotechnology & Genetic Engineering Department

BT353 Biochemistry Laboratory

Second Semester 2020-2021

Course Catalog
1 Credit Hours. Course Description and Objectives: This laboratory course has been designed to introduce students to the practical skills necessary to carry out the synthesis and characterization of chemical compounds/macromolecules and the measurement of properties associated with chemicals and their reactions. Students will also be introduced to biochemical calculation, pH calibration, buffer and experimental reagents preparation, practical spectrophotometry, chromatography, electrophoresis and SDS-PAGE. Students will be also introduced to several biochemical techniques including protein isolation and determination, practical experience in the determination of biochemical enzymes assays and kinetic parameters and the determination/characterization assays of carbohydrates and lipids.

Text Book	
Title	Experimental Biochemistry
Author(s)	R. Switzer and L. Garrity
Edition	3rd Edition
Short Name	Ref#1
Other Information	W. H. Freeman

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref#2	Introduction to Practical Biochemistry	G. Hegyi et al	1st Edition	Copyright, 2013 Eotvos Lorand University.
Ref#3	Biochemistry	M.K.Campbell and S. O. Farrell	9th Edition	2018

Instructor	
Name	**Dr. Nisreen Al-Quraan**
Office Location	PH1-L0
Office Hours	

Email	naquraan@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun : 14:30 - 16:30 Room: LAB 7 (PH2 L0) Section 2: Lecture Time: Tue : 12:30 - 14:30 Room: LAB 7 (PH2 L0) Section 3: Lecture Time: Wed : 12:30 - 14:30 Room: LAB 7 (PH2 L0) Section 4: Lecture Time: Tue : 08:30 - 10:30 Room: LAB 7 (PH2 L0)

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
963510	BT351 Biochemistry	Pre./Con.

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction and Laboratory Safety Rules	From **Ref#2**
Week 2	Experiment 1: Biochemical calculation, pH meter and buffers	From **Ref#1**
Week 3	Experiment 2: Spectrophotometry	From **Ref#1**, From **Ref#2**
Week 4	Experiment 3: Chromatography (gel filtration & ion exchange)	From **Ref#1**, From **Ref#2**
Week 5	Experiment 4: Chromatography (paper chromatography & TLC)	From **Ref#1**, From **Ref#2**, From **Ref#3**
Week 6	Experiment 5: Electrophoresis and SDS-PAGE	From **Ref#1**, From **Ref#2**, From **Ref#3**
Week 7	Midterm Exam	
Week 8	Experiment 6: Protein isolation	From **Ref#1**, From **Ref#2**, From **Ref#3**

Week 9	Experiment 7: Protein determination	From **Ref#1**, From **Ref#2**, From **Ref#3**
Week 10	Experiment 8: Enzyme assay (polyphenol oxidase)	From **Ref#1**, From **Ref#2**
Week 11	Experiment 9: Carbohydrates (monosaccharides)	From **Ref#1**, From **Ref#2**
Week 12	Experiment 10: Carbohydrates (polysaccharides)	From **Ref#1**, From **Ref#2**
Week 13	Experiment 11: Lipid (iodine number, saponification number and acid value)	From **Ref#1**, From **Ref#2**
Week 14	Final Exam	

Mapping of Course Outcomes to Program Student Outcomes	**Course Outcome Weight (Out of 100%)**	**Assessment method**
Know and describe the biochemical calculation, pH calibration, buffer and experimental reagents preparation, practical spectrophotometry and basic analytical methodology. [1A, 1B]	10%	Midterm Exam
Describe and practice the basic biochemical principles underlying common modern biochemistry laboratory techniques including chromatography, affinity purification and SDS-PAGE electrophoresis. [1A, 2B]	20%	Midterm Exam
Describe, explain and practice the techniques of protein isolation/purification and quantitative determination, enzymes purification, biochemical enzymes assays and kinetic analysis of enzymes activity. [1A, 2B]	20%	Final Exam
Describe and practice the protocols for quantitative determination of monoscharides and polyscharides and the lipid quantitative analysis in term of iodine number, saponification number and acid value. [1A, 2B]	20%	Final Exam
Demonstrate the effective reading and critical thinking in this laboratory exercises in term of short answer questions after the finish of each Lab experiment. [1A, 1B, 1D]	15%	Quizzes
Increase problem solving skills such as: critical thinking, data processing and graphical analysis of lab results by learning how to correctly execute the steps in a protocol you are given towards applying what you have learned from class to a practical situation. [1A, 1B, 1C, 1D]	15%	Reports/Assignments

Relationship to Program Student Outcomes (Out of 100%)					
A	B	C	D	E	F
33.75	53.75	3.75	8.75		

Evaluation

Assessment Tool	Weight
Midterm Exam	30%
Quizzes	15%
Reports/Assignments	15%
Final Exam	40%

Policy	
Course policies	1. All Laboratory materials and PPT, class announcements, and Exams ADDs will be posted on the Eleraning system. Students are responsible for ALL lab materials presented or assigned on Eleraning system. 2. Students are required to attend all labs! Please notify the lab instructor in advance if you have a conflict during the lab teaching time. Consequently, students are responsible for ALL material presented or assigned during the scheduled lab 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 each lab. Students will be allowed two absences before the final. Absences in excess of that stated above will result in the student failing in the course. 3. 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. 4. Since you will be working in groups, each group member should strive to complete their fair share of all lab activities. Learning how to work well together in a group is a critical skill that will serve you all. 5. You are responsible for cleaning your working area and all equipment used in the exercise before you leave your laboratory section. The lab instructor will check your bench before you leave the laboratory. Notify the laboratory instructor if there is a spill. Clean your glassware before leaving the lab so that you do not contaminate the next group?s results. 6. There are separate containers in the lab for general waste, sharp objects, and biohazard materials. Please place all refuse in the proper container; these containers ensure the safe removal of waste from the laboratory. If you have a question, ask your lab instructor before you dump waste in the wrong container. 7. At the beginning of each lab experiment a pre-lab talk will be given. This will cover any relevant theory, particular experimental difficulties, safety aspects, and any questions you might have about the experiment.
Grading System	Quizzes 15% Reports/Assignments 15% Midterm Exam 30% Final Exam 40% Total 100%

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