Spring 2020

CHEM 475-102: Biochemistry Lab I

Mengyan Li

NJIT New Jersey Institute of Technology

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE

Chemistry:
Spring 2020 Course Syllabus

NJIT Academic Integrity Code: All Students should be aware that the Department of Chemistry & Environmental Science (CES) takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

COURSE INFORMATION

Course Description: This course will offer the chemistry and related (chemical engineering, biology, bioinformatics, bioengineering) students fundamental laboratory approaches for biochemistry and biotechnology. These experiments will reinforce concepts learned in biochemistry lecture classes.

Number of Credits: 2

Prerequisites: CHEM 244 or CHEM 473 with a grade of C or better.

Course-Section and Instructors

Course-Section	Instructor
CHEM 475-101	Mengyan Li

Office Hours for All Chemistry & Environmental Science Instructors:
Email: mengyan.li@njit.edu
Office Hours: Tue from 1:00-3:00 PM or by appointment

Required Textbook:

Title	Fundamental Laboratory Approaches for Biochemistry and Biotechnology
Author	Alexander J. Ninfa, David P. Ballou and Marilee Benore
Edition	Second Edition
Publisher	John Wiley & Sons
ISBN #	978-0-470-08766-4

University-wide Withdrawal Date: The last day to withdraw with a **W** is Monday, April 6, 2020. It will be strictly enforced.

Learning Outcomes: Students can design and perform the research in Biochemistry

POLICIES

All CES students must familiarize themselves with, and adhere to, all official university-wide student policies. CES takes these policies very seriously and enforces them strictly.

Grading Policy: The final grade in this course will be determined as follows:

Lab Reports	40%
Midterm Exam	30%
Final Exam	30%

Your final letter grade in this course will be based on the following tentative curve:

A	90 - 100	**C**	70 - 74
B+	85 - 89	**D**	60 – 69
B	80 - 84	**F**	0 – 50
C+	75 - 79		

Attendance Policy: Attendance at classes will be recorded and is **mandatory**. Each class is a learning experience that cannot be replicated through simply "getting the notes."

Lab report Policy: Lab report is an expectation of the course and will be used in the determination of the final letter grade as described above. The Lab report should be written by your words with the style of the scientific article. All structures of chemicals used in the lab should be included in the method part. Submission due is every Sunday 11:59PM by email (No hard copy submission is accepted).

Exams: There will be one midterm exam held in class during the semester and one comprehensive final exam. The following exam periods are tentative and therefore possibly subject to change:

Midterm Exam	November 4, 2019
Final Exam Period	December 16, 2019

The final exam will test your knowledge of all the course material taught in the entire course.

Makeup Exam Policy: There will normally be **NO MAKE-UP QUIZZES OR EXAMS** during the semester. In the event that a student has a legitimate reason for missing a quiz or exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the CES Department Office/Instructor that the exam will be missed so that appropriate steps can be taken to make up the grade.

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times. Such devices must be stowed in bags during exams or quizzes.

ADDITIONAL RESOURCES

Chemistry Tutoring Center: Located in the Central King Building, Lower Level, Rm. G12. Hours of operation are Monday – Friday 10:00 am - 6:00 pm. For further information please click here.

Accommodation of Disabilities: Office of Accessibility Resources and Services (***formerly known as Disability Support Services***) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please contact Chantonette Lyles, Associate Director at the Office of Accessibility Resources and Services at 973-596-5417 or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Office of Accessibility Resources Services office authorizing your accommodations will be required.

For further information regarding self-identification, the submission of medical documentation and additional support services provided please visit the Accessibility Resources and Services (OARS) website at:

- http://www5.njit.edu/studentsuccess/disability-support-services/

Important Dates (See: Fall 2019 Academic Calendar, Registrar)

Date	Day	Event
September 3	T	First Day of Classes
September 13	F	Last Day to Add/Drop Classes
November 11	M	Last Day to Withdraw
November 26	T	Thursday Classes Meet
November 27	W	Friday Classes Meet
November 28 – December 1	R - Su	Thanksgiving Break - University Closed
December 11	W	Last Day of Classes
December 12-13	R - F	Reading Day
December 14-20	Sa - F	Final Exam Period

Course Outline

Lecture	Date	Topic	Assignment
1	01/21	Introduction: Basic practices and techniques in the biochemistry laboratory	Lab report
2	01/28	Spectrophotometry: Create a standard curve and determine concentration of unknown using spectrophotometer	Lab report
3	02/04	Quantification of protein concentration: Determine the concentration of a protein using the Bradford assay	Lab report
4	02/11	Chromatography: Separate a mixture of biomolecules based on size using gel filtration chromatography	Lab report
5	02/18	Gel electrophoresis of proteins: Separate a mixture of proteins using gel electrophoresis and determine the size	Lab report
6	02/25	Protein isolation: Purify a single protein from a complex mixture of proteins	Lab report
7	03/03	SDS-PAGE: Determine the purity of the isolated protein	Lab report
8	03/10	Enzyme kinetics: Determine the kinetic parameters (K_{cat} and K_M) of an enzyme	Lab report
9	03/24	Midterm Exam	

10	03/31	Polymerase chain reaction technology: Amplify DNA using PCR	Lab report
11	04/07	Agarose gel: Determine the size of the DNA fragment	Lab report
12	04/14	Miniprep: Isolate and characterize a plasmid.	Lab report
13	04/21	Transformation: Insert DNA into E. coli and select positive cells	Lab report
14	04/28	Bioinformatics: Use the internet to search databases and visualize molecular structures	Lab report
15	TBD	Final Exam	