NJIT New Jersey Institute of Technology

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE

Chemistry: Chem 474 Biochemistry II
Spring 2025 Course Syllabus

NJIT Academic Integrity Code: All Students should be aware that the Department of Chemistry & Environmental Science (CES) at NJIT takes the University Code on Academic Integrity very seriously and enforces it strictly. This means that students must not commit any forms of plagiarism, such as copying homework, class projects, or lab assignments or 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: Biochemistry II will focus on transducing and storing energy, synthesizing and engineering the molecules of life, and responding to environmental changes. Topics may include basic concepts of metabolism and its regulation and information transfer. These may consist of glycolysis and gluconeogenesis, the citric acid cycle, oxidative phosphorylation, photosynthesis, fatty acid metabolism, protein turnover and amino acid catabolism, amino acid biosynthesis, DNA replication and recombination, RNA synthesis and processing, protein synthesis, control of gene expression, the immune system, protein engineering and design (rational, directed evolution and artificial intelligence), and protein drug development.

Number of Credits: 3

Prerequisites: Chem 473 with a grade of C or better.

Course-Section and Instructors

Course-Section	Instructor
Chem 474-102	Edgardo Farinas

Office Hours for All Chemistry & Environmental Science Instructors: Tier 386: Monday 3:00-5:00
edgardo@njit.edu

Required Textbook:

Title	Biochemistry
Author	Reginald H Garrett Charles M Grisham
Edition	6
Publisher	Cengage Learning
ISBN #	978-1305577206

University-wide Withdrawal Date: Follow the NJIT academic calendar. It will be strictly enforced.

Learning Outcomes:

1. Explain basic concepts of metabolism, which may include glycolysis, Krebs cycle, and photosynthesis.
2. Explain details of information transfer, which in may include DNA metabolism, transcription, and protein synthesis.
3. Compare and contrast methods of protein engineering and optimization.

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:

In class performance	20
Quizzes	10
Midterm Exam I	20
Midterm Exam II	20
Final Exam (Presentation)	30

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

A	100-90	C	74-70
B+	89-85	D	69-60
B	84-80	F	<60
C+	79-75		

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."

Homework Policy: Homework is an expectation of the course. The homework problems set by the instructor are to be handed in for grading and will be used in the determination of the final letter grade as described above.

Exams: There will be two midterm exams 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 I	Week 5
Midterm Exam II	Week 9
Final Exam Period	May 10 - 16, 2025

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 Scott Janz, Associate Director at the Office of Accessibility Resources and Services at 973-596-5417 or via email at scott.p.janz@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: https://www.njit.edu/registrar/spring-2022-academic-calendar/)

Date	Day	Event
January 27, 2025	M	First Day of Classes
January 27, 2025	M	Last Day to Add/Drop Classes
January 28, 2025	M	Last Day to Withdraw
March 16 – 22, 2025	M	Spring Break
April 3, 2025	T	Wellness day
May 8 and 9, 2025	W, F	Reading Day
May 8 – 16 2024	S - F	Final Exam Period

Lecture	Section	Topic	Assignment
1		Immune system	
2		Information transfer: The Reception and Transmission of Extracellular Information	Chapter 32
3		Information transfer: DNA Metabolism: Replication, Recombination, and Repair; Translation and Regulation of Gerne Expression; Protein Synthesis	Chapter 28-30
4			
5		Recombinant DNA: Cloning and Creation of Chimeric Genes	Chapter 12
6		Directed Evolution Random mutation Recombination Cell sorting Case study	
7			
8		Exam 1	
9		Protein Display Phage Yeast *Echerichia coli* *Bacillus subtilus*	
10		Machine learning/Expanding the genetic code	
11			
12		Genome editing	
13		Exam 2	
14			
15		Presentation	
16		Presentations	
17		Presentations	