

Fall 2020

## **CHEM 473-001: Biochemistry**

Edgardo Farinas

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THE DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE

Chemistry: Chem 473 Biochemistry  
Fall 2020 Course Syllabus

**NJIT Academic Integrity Code:** Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.

*Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at [dos@njit.edu](mailto:dos@njit.edu)*

**COURSE INFORMATION**

Course Description: Prerequisite: [CHEM 244](#) or [CHEM 245](#) with a grade of C or better. Covers the fundamentals of biochemistry including buffers, blood, proteins, enzymes, carbohydrates, fats, and nucleic acids. Emphasis on the relationship of biochemistry to biotechnology and medicine.

Number of Credits: 3

Prerequisites: CHEM 244 or CHEM 245 with a grade of C or better.

Course-Section	Instructor
Chem 473-001	Edgardo Farinas

Office Hours <https://njit.webex.com/meet/edgardo>: **Tues 4:00-5:00; Weds 9:30-10:30**  
[edgardo@njit.edu](mailto: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: The last day to withdraw with a W is Monday, November 9, 2020. It will be strictly enforced.

Learning Outcomes:

1. Explain basic elements of structure of amino acids, proteins, nucleic acids, carbohydrates and lipids
2. Describe higher order structure in proteins and relate it to function
3. Illustrate examples to demonstrate that structure determines function
4. Demonstrate the role of the intermolecular forces in macromolecular structure and function
5. Apply knowledge of chemical kinetics in understanding enzyme catalysis and mechanism
6. Interpret kinetic data and identify types of enzyme inhibition
7. Write and describe the key biosynthetic pathways in living systems
8. Apply thermodynamic principles to understand energy production in biological systems
9. Discuss Electron transport and energy production

**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:

Homework/in class performance; group grading	10; 10 (20)
Quizzes	10
Midterm Exam I	20
Midterm Exam II	20
Final Exam	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	December 15 - 21, 2018

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](mailto: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/studentssuccess/disability-support-services/>

Important Dates (See: <http://www5.njit.edu/registrar/calendars/>)

### Course Outline

Lecture	Section	Topic	Assignment
1		Biochem overview, Water	1-3
2		Amino acids, Protein structure, primary secondary, tertiary protein function	4-6
3			
4		Protein structure function relationship, structural motifs, membrane proteins	
5			
6		CATALYSIS Kinetics, Enzyme mechanism, plotting kinetics, inhibition, drug mechanism allosteric inhibition, Hb and Myo	13-15
7			
8		Exam 1	
9		Carbohydrates: Structural aspects, monosaccharides, polysaccharides	7
10			
11		Lipids, structure, function, Vitamins and coenzymes	8

12			
13		Exam 2	10-13
14			
15		Nucleic Acids, RNA, DNA: structure, function, DNA synthesis, recombinant DNA	10-13
16			
17		ENERGY TRANSDUCTION: Metabolism, Catabolism, citric acid cycle oxidative phosphorylation	17

*Updated by Edgardo Farinas -Fall 2020*