NJIT New Jersey Institute of Technology

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE

CHEM 673: Biochemistry
Spring 2024 Course Syllabus

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"*

COURSE INFORMATION

Course Description: CHEM-673
Number of Credits: 3
Pre-requisites: Students must have an in-depth understanding of general and organic chemistry
Instructor: Patrick DePaolo, PhD
Email: depaolo@njit.edu

Course-Section	Meeting Times
CHEM-673 Section 104	**Friday 6:00 – 9:00 PM KUPF 209**

Office Hours: Tuesday 3:00PM – 4:00 PM & Friday 3:00PM – 5:00 PM in Tiernan 110 (Subject to change)
Webex meeting room: https://njit.webex.com/meet/*depaolo*

Webpage: The course website is available through Canvas, which can be accessed via canvas.njit.edu. Please email your instructor immediately if you cannot access the class site. All materials including lecture summaries, any PowerPoint slides, and other documents will be posted on the class site. Please check the site frequently for new materials and announcements. All grades for this course will be posted to Canvas on a regular basis. You are responsible for all updates posted to Canvas, and if you find any mistakes in content or grading, or you need help accessing these materials, please contact your instructor as soon as possible.

Optional Textbook:

Title	Biochemistry
Author	Berg, Tymoczko, Stryer
Edition	7th
ISBN #	9781133106296

University-wide Withdrawal Date: The last day to withdraw with a **W** is Monday, April 1st, 2024.

Prerequisites: *Students should have taken courses that allow them to:*

Explain chemical bonding, molecular structure and function, polarity of molecuels, hybridization theories, intermolecular forces of attraction, hydrogen bonding.

Explain concepts relating to the first, second, and third law of thermodynamics (meaning enthalpy, free energy, entropy and equilibrium constants, spontaneous, exothermic, and endothermic reactions)

Learning Outcomes:

1. Describe the basic elements of the structure of proteins, nucleic acids, carbohydrates, lipids and the linkages between them
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 endergonic and exergonic reactions and coupled processes
10. Discuss Electron transport and energy production
11. Discuss biochemical processes: replication, transcription, translation
12. Describe the flow of biological information and discuss how a mutation in DNA can alter cell function
13. Describe the different levels at which macromolecular function can be regulated
14. Learn to read primary literature and evaluate the merits and demerits of a scientific article

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. NO CHEATING! All homework assignments should be completed individually without the help of other students. You are allowed to use your class notes and information online to assist you with the homework assignments. You are **NOT PERMITTED** to use notes, electronic devices, or any assistance on the mid-term and final exams. If you are caught cheating you will receive a zero on the exam.

Grading Policy: The final grade in this course will be determined by a point total based on the following:

Homework	200
Attendance	100
Midterm Exam	300
Final Exam	300
Final Project	100
Total points	**1000**

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

A	>900	**C**	550 – 599
B+	800 – 899	**F**	< 550
B	700 – 799		
C+	600 – 699		

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

LECTURE (CONVERGED): Each lecture will have in-person and online modality through Webex. The link to join the Webex session will be posted on the course canvas page. In-person attendance is required for both the mid-term and final exam dates.

iCLICKER IN CLASSROOM: In order to track attendance we will use using iClicker Cloud. Each student must download the *iClicker Student app* (formerly iClicker Reef app) to their mobile device or laptop and sign up for at least the 6 month license (FREE). Students must create an account in the application or, if they have an account already, simply sign in. **When creating your profile, please use your name and NJIT email as it appears on the class roster**. Instructors will be using this app to assign grades so having the correct name and email is vital to getting the points you earned! Once in the app, simply select the "add a class" button (top right, appears as a plus sign), search for New Jersey Institute of Technology, and select the course with the name your instructor provides.

CLASS RECORDINGS: Class sessions may be recorded by the instructor. These recordings shall only be used as an educational resource and are not to be distributed or used outside of this class. Information on how to access recorded lectures will be made available by your instructor. Any recordings that contain identifiable information about students will not be used beyond this semester.

CLASS RECORDING ETIQUETTE*:* Students are expected to respect their fellow students' privacy and freedom to learn without disruption. Students are not allowed to capture or reproduce anyone's name, image, or voice without permission. They must be polite and respectful in the online chat. Informal chat is okay, but typing is restricted to things that one would say out loud in front of the entire class. Students must always conduct themselves on their webcam video as they would in person in a classroom.

COURSE LEARNING RESPONSIBILITY: COVID-19 pandemic has required that both instructors and students make changes to their normal working protocols for courses. We will still have content and quizzes online. As a result, students are asked to practice extra care and attention in regard to academic honesty, with the understanding that all cases of plagiarism, cheating, multiple submission, and unauthorized collaboration are subject to penalty. Students may not collaborate on exams or assignments, directly or through virtual consultation, unless the instructor gives specific permission to do so. Posting an exam, assignment, or answers to them on an online forum (before, during, or after the due date), in addition to consulting posted materials, constitutes a violation of the university's Honesty policy. Likewise, unauthorized use of live assistance websites, including seeking "expert" help for specific questions during an exam, can be construed as a violation of the honesty policy. All students should be familiar with the NJIT integrity code: ***http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.***

In addition to adhering to the NJIT Integrity statement, learning in the current environment also places a significant amount of responsibility on you. Please utilize all the resources that are available to you to be successful in the courses. Examples include paying full attention in class, copying notes, accessing the tutoring center, going to instructor office hours for help.

HOMEWORK POLICY:

Homework is 100% online and accessed via CANVAS. The homework is to test your understanding of the material being taught. This homework will build on the classroom content and enhance your understanding of the material. This homework will also be good preparation for the mid-term and final exams. To maximize your ability to learn through the homework each assignment allows multiple attempts. Each homework assignment has it due date. In addition, Canvas has a calendar with due dates. **ALL HOMEWORK MUST BE DONE ON TIME. There is no credit for late homework.**

EXAMS: There will be a midterm and a final exam held at class time during the semester. The following exam periods are tentative and therefore possibly subject to change:

Midterm	**3/8**
Final	**5/3**

The final exam will test your knowledge of the second half of material taught in the course.

ADMINISTRATION OF EXAMS: During the exams, you cannot use electronic devices besides a non-graphing calculator. There are no notes or books of any kind permitted, and you cannot speak with anyone during the exams. Failure to follow these guidelines will result in a grade of zero for the exam.

MAKEUP EXAM POLICY: There will normally be NO MAKE-UP 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. Arrangements will be made for students who have a valid excused absence verified by the dean's office.

FINAL PROJECT: There will be a final project where you will pick a biochemistry paper of your choice as a group of 3-4 students and create a 10-15 minute presentation on the paper. The presentation rubric and instructions will be given by the 5th week of the semester.

ADDITIONAL RESOURCES

Accommodation of Disabilities: Office of Accessibility Resources and Services, **OARS** (***formerly known as Disability Support Services***) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT. See https://www.njit.edu/studentsuccess/node/5 to learn more about their services.

If you are in need of accommodations due to a documented disability, please contact the Office of Accessibility Resources and Services 973-596-5417 or via email oars@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 is required to receive accommodations on assignments or exams. Eligible students requiring special conditions for exams must fill out an OARS forms stating the date and time of the exam. It is advisable for eligible students to fill out forms for the two common exams the first week of classes

Mental Health and Well-being: NJIT is committed to the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Center for Counseling and Psychological Services (c-CAPS) at https://www.njit.edu/counseling/ or by calling the c CAPS office at 973-596-3414. If you need support and information about options and resources, please also reach out to the Office of the Dean of Students at https://www.njit.edu/dos/

IMPORTANT DATES: (See Spring 2024 Academic Calendar)

January	15	Monday	Martin Luther King, Jr. Day
January	16	Tuesday	First Day of Classes
January	20	Saturday	Saturday Classes Begin
January	22	Monday	Last Day to Add/Drop a Class

January	22	Monday	Last Day for 100% Refund, Full or Partial Withdrawal
January	23	Tuesday	W Grades Posted for Course Withdrawals
January	29	Monday	Last Day for 90% Refund, Full or Partial Withdrawal, No Refund for Partial Withdrawal after this date
February	12	Monday	Last Day for 50% Refund, Full Withdrawal
March	4	Monday	Last Day for 25% Refund, Full Withdrawal
March	10	Sunday	Spring Recess Begins - No Classes Scheduled - University Open
March	16	Saturday	Spring Recess Ends
March	29	Friday	Good Friday - No Classes Scheduled - University Closed
March	31	Sunday	Easter Sunday - No Classes Scheduled - University Closed
April	1	Monday	Last Day to Withdraw
April	30	Tuesday	Friday Classes Meet
April	30	Tuesday	Last Day of Classes
May	1	Wednesday	Reading Day 1
May	2	Thursday	Reading Day 2
May	3	Friday	Final Exams Begin
May	9	Thursday	Final Exams End
May	11	Saturday	Final Grades Due

Course Outline

Week	Topic	Homework
1	Chapter 1L Biochemistry Overview, Water	Homework 1
2	Chapter 2: Amino acids and peptide bonds	Homework 2
3	Chapter 3: Proteins	Homework 3
4	Chapter 7: Hemoglobin: portrait of a protein Chapter 8: Enzyme-Kinetics and specificity	Homework 4
5	Chapter 9: Catalytic Strategies	Homework 5
6	Chapter 11: Carbohydrates/Lipids	Homework 6
7	Chapter 12: Lipids and Membranes	Homework 7, Review for exam
8	**Mid-term**	
9	Chapter 15 and 16: Metabolism and Glycolysis	Homework 8
10	Chapter 17: TCA Cycle	Homework 9
11	Chapter 18: Electron Transport Chain	Homework 10
12	Chapter 5,28: Nucleic acids, structure function	Homework 11
13	Chapter 29, 30: Overview of Biological Information Transfer	Homework 12, prep present
14	Final presentations	
15	**Final Exam**	

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