NJIT BIOLOGY

Course Syllabus

FALL 2023

BIOL 202 Foundations of Biology - Cellular/Molecular Biology

FACE-to-FACE COURSE

COORDINATOR	Dr. Mary Konsolaki	**EMAIL:**	mary.konsolaki@njit.edu
INSTRUCTORS:	Dr. Jonathan Trinidad Dr. Yuchen Zhang	**OFFICE HOURS:**	Tue 1:30-3:00pm (F2F) or by appointment (virtual)
COURSE SCHEDULE:	**CKB 326** Mon 8:30-11:20 am Y. Zhang Mon 1:00-3:50 pm J. Trinidad Mon 6:00 pm-8:50 pm J. Trinidad Thu 8:30-11:20 am Y. Zhang	**COURSE WEBSITE:**	**https://njit.instructure.com/courses/31699**

COURSE DESCRIPTION: This course surveys the chemical components and structure of the cell and methods of study; thermodynamics and metabolism; membrane biology, energy utilization and transfer; protein and nucleic acid structure and function; transcription, translation, gene regulation and cellular transport, signaling and communication. This laboratory complements the lecture course BIOL201 Foundations of Biology: Cell and Molecular Biology. Both courses BIOL201 and BIOL202 must be taken concurrently, although they are separate courses with different grades.

PREREQUISITES:
Concepts in Biology BIOL200, and Chemistry BIOL121 or BIOL125. Concurrent enrollment in BIOl201 required.

LEARNING OBJECTIVES
Through selected readings, lectures, discussions and occasional group activities, students are encouraged to learn on their own about the main processes taking place in the cell from a molecular perspective. After successfully completing the course, students will have

- ✓ the ability to describe the general structure of biomolecules as well as their role in cellular metabolism and the flow of genetic information;
- ✓ information and concepts on bioenergetics and the use of energy by cells;
- ✓ the information on the principles of membrane transport mechanisms and their role in important physiological processes at the organismal level;
- ✓ acquired concepts and general principles on gene expression and its regulation;
- ✓ knowledge on the concepts and general principles on eukaryotic signal transduction;
- ✓ the skills to read, interpret and apply general information in the fields of cell and molecular biology;
- ✓ evaluate contemporary hypotheses on the functional mechanisms of the cell;
- ✓ reinterpret and/or postulate alternative hypotheses or ideas to explain or describe the phenomena studied in the course;
- ✓ the opportunity to explore the topics covered in the course in higher level classes which require Foundations 201/202 as pre-requisites in the biology major and minor.

INSTRUCTIONAL MATERIALS: All reading materials for this course will be provided by the instructors and can be accessed on Canvas. Students are required to wear a laboratory coat and bring a scientific laboratory notebook (specifications will be provided in class).

Some additional reading may be occasionally assigned from the following online resources (free text): Harvard University MCB https://projects.iq.harvard.edu/lifesciences1abookv1 and Labxchange https://www.labxchange.org/

SUPPLEMENTAL MATERIALS: Any additional materials required for class would either be provided through Canvas (UCID required), or via web link.

ATTENDANCE
Attendance is mandatory for this class and will be monitored through short in-class quizzes. You will need to have a computer or a cell phone in order to complete these quizzes online. If you expect to miss a class for a valid reason, please email your instructor and provide documentation.

CODE OF STUDENT CONDUCT: 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

REASONABLE ACCOMMODATION: If you have a special need that may require an accommodation or assistance, please inform me of that fact as soon as possible and no later than the end of the second class meeting. Students with disabilities who require accommodations must contact Dr. Phyllis Bolling, Center for Counseling and Psychological Services (C-CAPS), Campbell Hall, (entry level), room 205, (973) 596-3420

COURSE EVALUATION	
Attendance / Pre lab	10%
Notebook submissions (8)	40%
Lab Report	20%
2 Exams	30%
TOTAL	**100%**

Grading Scale			
A	90-100	C	70-74
B+	85-89	D	60-69
B	80-84	F	0-59
C+	75-79		

Late work: Work submitted late will be penalized with a 10% per day reduction.

COURSE SCHEDULE

Schedule: Dates listed by week; Labs will meet once every week, unless otherwise noted. Homework assignments will be due on Canvas at midnight, the night before the next lab. Please note that this is the proposed schedule and is subject to change. A more detailed schedule will be continually updated via the course Canvas site.

Week	Activity
Sept 11	Lab 1. Introduction/Making solutions (Attendance 2.5, Postlab 3)
Sept 18	Lab 2 Ph adjustment of solutions (Titration) (Prelab 2pts, Postlab 3pts Attendance 0.5)
Sept 25	Lab 3 Protein quantitation (Bradford method) (Prelab 2pts, Postlab 3pts Attendance 0.5)
Oct 2	Lab 4 Measuring Enzyme kinetics (Prelab 2pts, Postlab 3pts Attendance 0.5)
Oct 9	**Laboratory First Exam (Labs 1-4)**
Oct 16	Lab 5 Lab Report Orientation (Attendance 2.5, Postlab 3)
Oct 23	Lab 6 Protein separation with gel electrophoresis (Sickle Cell Anemia) (Prelab 2pts, Postlab 3pts Attendance 0.5)
Oct 30	Lab 7a DNA isolation and PCR (Genetic Fingerprinting I) Attendance 0.5
Nov 6	Lab 7b Gel electrophoresis of PCR products to determine genotype (Genetic Fingerprinting II) (Prelab 2pts, Postlab 3pts Attendance 0.5)
Nov 13	Lab 8 Drosophila lab (look up) (Prelab 2pts, Postlab 3pts Attendance 0.5)
Nov 20	Thanksgiving week
Nov 27	Lab 9 CRISPR-Cas9 (Prelab 2pts, Postlab 3pts Attendance 0.5)
Dec 4	**Laboratory Second Exam (Labs 5-8)**
Dec 11	Lab Report due