

BIOLOGY 356 Cellular Biology
FACE-to-FACE CLASS

INSTRUCTORS:	Dr. Mary Konsolaki	EMAIL:	mary.konsolaki@njit.edu
OFFICE:	CKB 340D 973-642-4975	OFFICE HOURS:	Tue 11:30-1:00pm (F2F) or by appointment (virtual)
COURSE SCHEDULE:	Wed-Fri 8:30-9:50am CKB 341	COURSE WEBSITE:	https://njit.instructure.com/courses/42989

ATTENDANCE

Attendance is mandatory for this class and will be monitored through short in-class quizzes online. Attendance of 85% of lectures earns full attendance credit for the course. You will need to have a computer or a cell phone in order to complete attendance quizzes online. If you expect to miss a class for a valid reason, please email the DoS office, provide documentation and if excused, ask them to email Dr. Konsolaki (mary.konsolaki@njit.edu)

COURSE DESCRIPTION: A detailed study of molecular mechanisms that take place in bacterial and eukaryotic cells and govern the replication of DNA and repair in preparation of cell division, DNA transposition, and the transmission of information from DNA, to RNA, to protein. Emphasis will be placed on engaging in case studies and reading primary literature in order to understand the methods that are used to discover current findings in biological and biomedical research. Students will be able to describe techniques that are used to answer basic questions in Molecular Biology.

PREREQUISITES:

BIOL 201 and BIOL 202 or R21:120:201 and R:21:120:202 and BIOL 205 and BIOL 206 or R21:120:205 and R21:120:206.
CHEM 125 (or R21:160:115) and CHEM 126 (or R21:160:115)

OBJECTIVES: To provide the student with: (1) knowledge of terms, concepts and theories of how biological information is flowing in cells (2) the ability to integrate the material from multiple sources and research (3) improved critical thinking skills and the opportunity to apply molecular biology concepts in everyday biology-related applications

INSTRUCTIONAL MATERIALS:

New material will be provided in the form of readings from the primary literature. Students who want a resource to refresh their background knowledge can use either their existing textbook from BIOL 201 (Alberts' "Molecular Biology of the Cell") or free textbooks from NCBI (<https://www.ncbi.nlm.nih.gov/guide/literature/> or an OER textbook such as Fundamentals of Cell Biology (<https://open.oregonstate.education/cellbiology/>)). Primary research literature and case studies will be posted by the instructor.

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

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 us 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 PROCEDURES:

GRADING	POINTS
Exam 1	20% (100pts)
Exam 2	20% (100pts)
Exam 3 (Final)	20% (100pts)
Review quizzes	10% (55pts)
Homework/Classwork	20% (100pts)
Attendance & Participation	10% (50pts)
TOTAL	100% (500pts)

GRADING SCALE	
A	90-100
B+	85-89
B	80-84
C	65-74
D	50-64
F	0-49

Extra Credit: There will be no individualized opportunities for extra credit. There may be opportunities for the entire class during the course.

The topics to be covered will include:

- DNA replication
- DNA repair
- Chromatin structure and function
- Bacterial and eukaryotic transcription
- RNA processing
- Post transcriptional controls
- transposition
- translation
- post translational controls
- protein function
- protein families
- DNA binding motifs and regulatory proteins
- Regulation of transcription
- Molecular switches
- Cell biology in the -omics area

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

COURSE SCHEDULE

The class will meet twice per week. One weekly meeting will be devoted to presentation of content material in a lecture form. The second weekly meeting will be devoted to either analyzing a case study (students will work in groups of 3-4) or to students presenting parts of a primary research peer reviewed publication.

Week of	Lecture Topic	Assignments Due
9/2	Introduction to Molecular Biology/Mechanisms of transcription and assays	
9/9	Mechanisms of transcription and assays-II / Case study	HW1 (Canvas)
9/16	Role of histones and nucleosomes in eukaryotic transcription / Peer reviewed paper analysis	HW2 (Canvas)
9/23	Post-transcriptional controls / Student presentations of primary literature	Review Quiz 1 on Canvas
9/30	Transposition – Exam 1	HW3 (Canvas)
10/7	DNA replication / Case study analysis	HW4 (Canvas)
10/14	DNA repair / Case study analysis	HW5 (Canvas)
10/21	DNA binding motifs and regulatory proteins/ Student presentations of primary literature	HW6 (Canvas)
10/28	Regulation of transcription/ Case study analysis	Review Quiz 2 on Canvas
11/4	Translation – Exam 2	HW7 (Canvas)
11/11	Post translational controls / Case study analysis	HW8 (Canvas)
11/18	Protein function / Case study analysis	HW9 (Canvas)
11/25	Database exploration Online Wednesday/Thanksgiving	HW10 (Canvas)
12/2	Protein families / Student presentations of primary literature	Review Quiz 3 on Canvas
12/9	Molecular Biology in the -omics era / Student presentations	No HW
12/16	Final Exam - During Final Exam Period*	Final Exam Schedule will be posted here: http://www5.njit.edu/registrar/exams/

- HW/Quizzes- 15%
- Presentation or performance - 20%
- Writing assignments - 20%
- Database analysis Group report - 10%
- Attendance – 5%
- Final paper or exam - 30