

## BIOLOGY 453/653 : APPLICATIONS OF GENETICS AND GENOMICS

<b>INSTRUCTOR:</b>	Dr. Mary Konsolaki	<b>EMAIL:</b>	mary.konsolaki@njit.edu
<b>OFFICE:</b>	CKB 340D 973-642-4975	<b>OFFICE HOURS:</b>	Tue 11:00am-12:45pm or by appointment (F2F or Zoom)
<b>COURSE SCHEDULE:</b>	CKB 106 Mon-Wed 10:00-11:20am	<b>COURSE WEBSITE:</b>	<a href="https://njit.instructure.com/courses/32667">https://njit.instructure.com/courses/32667</a>
<b>ROOM:</b>	CKB 106		

**COURSE DESCRIPTION:** Applied Genetics and Genomics provides to NJIT and Rutgers students a broad overview of the ongoing explosion of technological developments that have followed the sequencing of the Human Genome. An understanding of state-of-the-art Genetics and Genomics is indispensable for continuing education in fields that include but are not limited to: cell and molecular biology, clinical lab science, bio-mechanical engineering, forensics, biotechnology, agriculture, and medicine.

**PREREQUISITES:** 120:352 OR BIOL 352.

**COURSE OBJECTIVES:** 1) increase student exposure to advances stemming from the availability of vast amounts of genomic data 2) offer students extensive knowledge of current applications of Genetics 3) improve critical thinking and evaluation skills in areas relating to personal genomics and biomedicine 4) Introduce students to ethical dilemmas that are related to current genomic technologies

**INSTRUCTIONAL MATERIALS:** All materials for this course will be obtained from open internet sources and will be provided by the instructor.

**SUPPLEMENTAL MATERIALS:** Any additional materials required for class (primary literature, etc) will be provided through the class Canvas site (<https://njit.instructure.com/courses/28244> UCID required), handed out in class, or distributed via web link. Be sure to edit your Canvas profile to list an email address that you check regularly. I-clickers will be used regularly for attendance.

**ACADEMIC INTEGRITY:** 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)

**REASONABLE ACCOMMODATION:** If you have a special need that may require accommodation or assistance, please inform the instructors 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.

**GRADING:** The final grade in this course is determined as follows:

COURSE EVALUATION (BIOL453)	
Group/Class work	100pts (25%)
Project	100pts (25%)
HW	100pts (25%)
Two Exams	100pts (25%)
<b>TOTAL</b>	<b>400pts</b>

Grading Scale			
A	90-100	B+	85-89
B	80-84	C+	75-79
C	65-74	D	50-64
F	0-49		

**BIOL653 :** In addition to the work described in the Table above, graduate students will be required to study independently a topic related to the course content and give a presentation to the class. The topic will be decided with the instructor and they will receive guidance during the process. This presentation will be graded out of 50 points, which will be considered as bonus points added to their total grade.

**CLASS ATTENDANCE IS REQUIRED:** Attendance will be taken and attendance and participation is expected. Two unexcused absences will result in a 5% reduction in the final grade, and a third unexcused absence will result in an additional loss of 5%.

**MAKE-UP POLICY: Assignments:** There are no make-ups for in class assignments **EXCEPT** for a written excused absence. Information on homework assignments will be posted on Canvas following class, and it will be the student's responsibility to check for this. Make-up work must be completed within one week following a missed class.

**Examples of excused absences:** Serious illness, school trips, major religious holidays, and death of a family member. Unexcused absences include minor illness, transportation problems, non-emergency appointments, traveling home for the weekend, etc. **Written verification, e.g., doctor's note, traffic report, or court records, will be required.** If the absence is excused, the student will be offered the chance to make-up work at a time convenient for student and instructor. For anticipated absences due to observance of religious holidays, the student must notify the instructor in writing in advance.

**LATE WORK:** Assignments will be due at the beginning of the class as outlined in their descriptions in the syllabus and posted on Canvas. If a student must be absent on the day work is due, it will be that student's responsibility to turn the assignment in **early** or make arrangements for someone else to turn it in on the due date. Other possibilities include submitting an electronic version via email. Late work will receive a penalty of 10% off per day late.

**OTHER POLICIES:** No cell phone usage in class, please turn off or to silent mode.

**HINTS/TIPS:**

- ⊗ Read any assigned articles/readings ahead of time. We will often have discussions in class (during which your participation will be noted) –so it may be helpful if you have actually read what we are discussing.
- ⊗ If you don't understand a concept or assignment, ask (more than a couple of hours ahead of the due date, please).
- ⊗ DO NOT Procrastinate!
- ⊗ DO NOT Plagiarize (collaboration is fine)!
- ⊗ Choose topics in which you have a genuine interest. This will make your hard work more enjoyable and worthwhile.

## Course Syllabus SPRING 2024

*Subject to changes (will be announced in class and on Canvas). Dates listed by week; lectures will meet twice every week, unless otherwise noted. Homework assignments will be due on Saturday midnight, on Canvas. A more detailed schedule will be continually updated via the course Canvas site.*

WEEK	TOPIC	ASSIGNMENT
1/15	Gene Function/Genotype to phenotype/ Mutations/ Transposable elements	HW 1
1/22	High-throughput sequencing (HTS)/-omics techniques	HW 2
1/29	Personalized medicine	HW 3 / Groupwork 1
2/5	Pharmacogenomics / GWAS	HW 4
2/12	SNP Exploration	HW 5
2/19	Genome-wide association studies / Reproductive Genetics	HW 6 / Groupwork 2
2/26	Reproductive Genomics 2	HW 7 (ethics)
3/4	CRISPR / Plant Genomics	No HW
3/11	<b>SPRING BREAK – NO CLASSES</b>	
3/18	Golden rice / Wheat Genome	Groupwork 3
3/25	GMO plants / Exam 1	HW 8
4/1	Microbiome	HW 9
4/8	Stem Cell Genomics	HW 10 (ethics)
4/15	Mitochondrial Targeting	Groupwork 4 (ethics)
4/22	GWAS case study/	GWAS In-Class project
4/29	Group project presentation / <b>FINAL EXAMS – EXAM 2</b>	