

## BIOLOGY 200 (001-007): CONCEPTS IN BIOLOGY

**INSTRUCTOR:** Dr. Maria Stanko, [mstanko@njit.edu](mailto:mstanko@njit.edu), 340E CKB, Office Hours Wed. 11:30 am-2:30 pm or by appointment

**TEACHING ASSISTANT:** Office Hours: Email for appointment

**LECTURES:** T, R: 10:00am-11:20am [CKB G08]

**RECITATION (BY SECTION):** 1 period (80 mins), Fridays, please see course schedule for time and location: <https://uisnetpr01.njit.edu/courseschedule/>

### COURSE DESCRIPTION:

This course will introduce students to the study of biology at the beginning of their course of study. Central ideas in the biological sciences will be highlighted, with an emphasis on the process of scientific discovery and investigation. The course will provide the basis for more advanced coursework and learning experiences in biological sciences as students delve into the curriculum of study. This is a required course for all NJIT and Rutgers-Newark Biology majors.

### REQUIRED MATERIALS:

An **iClicker** is required for this course. You can purchase one from the NJIT or Rutgers campus bookstore. Any version of an iClicker brand device is acceptable, but we do not accept the iClicker/REEF smartphone app.

### COURSE WEBSITE:

This course has no textbook. We will use [Open Stax Biology 2e](#) Course readings and online resources will generally be provided via **CANVAS**: <https://canvas.njit.edu>, **login with UCID**. **Please ensure you can access the Canvas site as soon as possible!**

### GRADING POLICY:

Your grade for this course will be determined based on a number of components (the breakdown is below).

| COMPONENT                             | % Range  | STANDARD %  | YOUR % |
|---------------------------------------|----------|-------------|--------|
| Learning journal                      | 5 - 10%  | 7.50%       |        |
| Lecture Participation                 | 5 - 10%  | 8.75%       |        |
| Recitation preparation/ participation | 10 - 18% | 16.25%      |        |
| Homework / Quizzes                    | 25 - 30% | 27.50%      |        |
| Projects                              | 10 - 20% | 20%         |        |
| Exams                                 | 18 - 30% | 20%         |        |
| <b>TOTAL</b>                          |          | <b>100%</b> |        |

| LETTER GRADE | SCALE    |
|--------------|----------|
| A            | > 90%    |
| B+           | 85 – 90% |
| B            | 80 – 85% |
| C+           | 75 – 80% |
| C            | 70 – 75% |
| D            | 60 – 70% |
| F            | < 60%    |

**BIOLOGY 200 (001 - 007): CONCEPTS IN BIOLOGY**

**SCHEDULE AND COURSE OUTLINE:** Dates listed by week; lectures will meet twice every week and recitation will meet every week, unless otherwise noted. 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 OF       | LECTURE TOPIC   | RECITATION                   | SELECTED ASSIGNMENTS  |
|---------------|---|------------------------------|---|
| 9/2           | Intro: Syllabus, Class purpose, Goals<br>What is Science?                 | Introduction / Pre-Quiz      | HW 1 - Syllabus (5pts)  |
| 9/9           | What is Biology?<br>Graphing/Numbers & Figures                            | Interpreting graphs          |   |
| 9/16          | Evolution/Natural Selection<br>Adaptation/Fitness                         | Selection: dogs and peacocks | HW 2 Selection assignment (10pts)   |
| 9/23          | What is flu?<br>DNA Discovery/Structure                                   | Disease spread               | <b>Review Quiz 1 on CANVAS</b><br>Finish graph for recitation                             |
| 9/30          | DNA Replication<br>Transcription/RNA processing                           | Copying DNA (PCR)            | HW 3 Bird flu (10 pts)  |
| 10/7          | Translation<br>Gene Expression  | Decoding the flu             | Project 1, Part 1   |
| 10/14         | Mutation<br>Phylogenetic Trees  | SARS                         | Project 1, Part 2   |
| 10/21         | <b>Exam 1</b><br>Scientific Writing                                       | Discuss Exam 1               | Project 1, Part 3   |
| 10/28         | What is DFTD?<br>Cell Cycle/Mitosis                                       | DFTD                         | HW 4 Plagiarism (10pts)   |
| 11/4          | Cancer<br>Meiosis   | Cancer genetics              | <b>Review Quiz 2 on CANVAS</b><br>Project 1, Part 4                                       |
| 11/11         | Epigenetics<br>Inheritance  | Pedigree Worksheet           | HW 5 Graphing devils (10 pts)<br>Project 2, Part 1  |
| 11/18         | Population Genetics<br>Interactions / Competition                         | Tasmanian food web           | HW 6 Pedigrees (10 pts)   |
| 11/25         | Predation / Trophic Cascades<br><b>Thurs. - No Lecture (Thanksgiving)</b> | <b>NO Recitations</b>        | Project 2, Part 2   |
| 12/2          | Interaction Networks<br>Life History Strategies                           | Tasmanian devil life history | Project 2, Part 3<br><b>Review Quiz 3 on CANVAS</b>                                       |
| 12/9          | Other examples: Ebola<br><b>Thu – No Lecture</b>                          | <b>NO Recitations</b>        | HW7 – Ebola readings questions (10 pts)<br>Project 2, Part 4                              |
| 12/14-20      | <b>Exam 2 &amp; Post Quiz - During Final Exam Week***</b>                 |                              | <a href="http://www5.njit.edu/registrar/exams/">http://www5.njit.edu/registrar/exams/</a> |
| <b>FINALS</b> | <b>FINAL EXAM WEEK: DECEMBER 14-20, 2019</b>                              |                              |   |

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**\*\*\*DO NOT SCHEDULE TRAVEL DURING THE FINAL EXAM PERIOD UNTIL AFTER THE NJIT FINAL EXAM SCHEDULE HAS BEEN ANNOUNCED.**

### ATTENDANCE, MAKE-UP, AND LATENESS POLICY:

- All course materials (including recordings of lectures) are for students' own use only (no sharing or posting anywhere).
- **Homework and projects may be submitted late, but 10% of the points available for each 24 hours after the assignment was due will be deducted from late submissions.** Email me for access to submit HWs in Canvas 'quiz' format after the deadline.
- Late submissions (up to 10 days late) of journals will receive half credit.
- Review quizzes, reading prep quizzes, and exams cannot be completed late without documentation of an excusable absence. Each student is expected to do his or her own work independently. (See Academic Dishonesty statement below.)

**RECITATION POLICIES:** Recitation is an essential part of the course, in which you will meet in smaller groups to discuss class concepts and work together to solve biological problems. Points will be earned each week from a combination of attendance, participation, and a weekly quiz assessing whether you have read the week's materials. Recitation materials (available on Canvas) must be printed or downloaded to a laptop or tablet. A phone is not an acceptable format for viewing recitation materials. Your recitation instructor may have additional policies.

**ACADEMIC DISHONESTY:** The course has a zero tolerance policy for academic dishonesty, including plagiarism and cheating. Instances of dishonesty will be punished by a zero on the assignment and consultation with the office of the Dean of Students to determine if further action is required. If you have any questions about what constitutes plagiarism or cheating, please ask or refer to the [Academic Integrity Code](#).

### LEARNING OUTCOMES:

#### 1. Learning How to Learn

- Students will develop personal learning strategies based on recognition of their own learning processes.
- Students will identify their learning style and develop a learning plan that is aligned with that style.
- Students will reflect on the note taking and study process and self-monitor their habits throughout the semester
- Students will develop a plan for their continued learning beyond this course.

#### 2. Application

- Students will develop hypotheses to explain observed phenomena.
- Students will design a basic experiment to test a hypothesis, taking into account the ethical and methodological considerations for proper experimental design.
- Students will read and evaluate data critically:
  - identify and describe patterns in raw data.
  - interpret statistical analysis of others' results.
  - draw conclusions based on graphical presentation of data.
- Students will communicate scientific information effectively:
  - present source material without plagiarizing.
  - convey information in written and graphical form.
  - target delivery appropriately to audience.

#### 3. Integration

- Students will synthesize ideas from multiple areas in order develop complex concepts.

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### 4. Human Dimension

- Students will feel confident in their ability to apply knowledge to solve problems.
- Students will cooperate with their peers to solve problems as part of a team.
- Students will take responsibility for their learning process and academic success.

### 5. Caring/Valuing

- Students will get excited about the value of course material within their personal and professional lives. Students will commit to being a good learner in this course and beyond.

### 6. Biological Principles

Students will....

1. Identify mechanisms of evolutionary change and explain how they lead to genetic change in populations through time.
2. Describe the structural characteristics of nucleotides (DNA/RNA) and explain how they are related to the functions of these molecules.
3. Identify the basic steps involved in gene expression and describe ways that gene expression can be regulated so that different cells produce different proteins.
4. Be able to transcribe information from DNA to RNA and to translate mRNA into amino acid sequences.
5. Interpret information depicted on a phylogenetic tree.
6. Outline the stages of cell division (mitosis and meiosis), explain what occurs during each stage, and describe how the nuclear DNA of daughter cells compares to that of the original cell.
7. Be able to utilize a Punnett square to predict the potential genotype/phenotype of offspring.
8. Define and give some examples of interspecific interactions and describe how different types of interactions affect the population sizes of the species involved.
9. Identify the different trophic levels in a community and explain how energy moves through them.
10. Explain traits related to an organism's life history and what influences the evolution of different life history strategies.

*Individual class sessions will likely have more specific content outcomes, based on what is being discussed that week and how it relates to the larger goals of the course. Look for those to be posted to CANVAS and disclosed by the professor.*