NJIT BIOLOGY

Course Syllabus

SPRING 2017

BIOLOGY 200 (002-016): CONCEPTS IN BIOLOGY

INSTRUCTORS:	Dr. Mary Konsolaki, konsolaki@njit.edu, 340D CKB, Office Hours Thurs.: 12:00-2:30 pm or by appointment
	Dr. Maria Stanko, mstanko@njit.edu, 340E CKB, Office Hours Tues. 11:30-2:00 pm or by appointment
LECTURES:	M, W: 10:00am-11:25am [CKB 303] –OR– T, R: 10:00am-11:25am [CKB 303]
RECITATION (BY SECTION):	1 period (85 mins), Thurs OR Fri , please see course schedule for time and location: http://courseschedules.njit.edu/index.aspx?semester=2017s&subjectID=BIOL

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 **i▸Clicker** 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. Course readings and online resources will generally be provided via Moodle: http://moodle.njit.edu/, **login with UCID**. **Please ensure you can access the Moodle 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	POINTS
Recitation Participation	65 points
Lecture Participation	35 points
Moodle Quizzes & Journal	55 points
Homework Assignments	65 points
Exams	80 points
Projects	80 points
TOTAL	**380 points**

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

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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.

SCHEDULE AND COURSE OUTLINE: Please note that this is the proposed schedule. We may make changes to the schedule when needed; you will be notified of any changes. Readings and assignments will be posted to the course website.

WEEK OF	LECTURE TOPIC	RECITATION	SELECTED ASSIGNMENTS
1/16	**Mon - No Lecture** Intro: Learning Styles, Class purpose/Goals	Discussion on Intelligence	HW1 - **Syllabus** (5pts)
1/23	What is Biology? Graphing/Numbers & Figures	Interpreting graphs	**Pre- Quiz on Moodle** Finish Graph for recitation
1/30	Scientific Writing Bioethics	Ethics case studies	
2/6	Evolution/Natural Selection Adaptation/Fitness	Selection: dogs and peacocks	HW2 Plagiarism (10pts) **Quiz 1 on Moodle**
2/13	What is flu? DNA Discovery/Structure	White-nose syndrome	HW3 Selection assignment (10pts) Project 1, Part 1
2/20	Transcription/Translation Gene Expression	Decoding the flu	HW4 Bird flu (10 pts) Project 1, Part 2
2/27	Mutations Phylogenetic Trees	SARS	Project 1, Part 3
3/6	**Exam 1** What is DFTD?	Discuss Exam 1 DFTD	
3/13	**No Lectures – Spring Break**	**No Recitations**	
3/20	DNA Replication & Cell Cycle Mitosis	Copying DNA	HW5 Graphing population changes (10pts) Project 1, Part 4
3/27	Cancer Meiosis	Cancer exercise	**Quiz 2 on Moodle** Project 2, Part 1
4/3	Inheritance Population Genetics	Pedigree worksheet	Project 2, Part 2
4/10	Interactions / Competition Predation / Trophic Cascades	**NO Recitations**	HW6 Pedigrees (10 pts)
4/17	Mutualism / Parasitism Interaction Networks	Tasmanian food web	Project 2, Part 3 **Quiz 3 on Moodle**
4/24	Life History Strategies Other examples: Ebola	Tasmanian devil life history	HW7 – Ebola readings questions (10 pts) **Post Quiz on Moodle** Project 2, Part 4
5/5-11	**Exam 2 - During Final Exam Week*****		http://www5.njit.edu/registrar/exams/
FINALS	**FINAL EXAM WEEK: MAY 05-11, 2017**		

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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:

- Lectures and recitations are linked, and attendance at all course sessions is important to doing well in the course.
- Weekly quizzes will be given in recitation, so be sure to arrive prepared for class. If you must miss recitation for a valid reason, please discuss making up the missed material with your recitation instructor as soon as possible.
- Participation in lecture will be assessed using the iClickers. Be sure you bring your iClicker to every lecture!
- **Late assignments will be deducted 10% of the points available for each 24 hours after the assignment was due.** This is true for ALL assignments.
- **Exams and quizzes may be made up only with a valid, documented excuse.**

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.
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. .

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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 Moodle and disclosed by the professor.