

BIOLOGY 200 (002-016): CONCEPTS IN BIOLOGY

INSTRUCTORS: Dr. Andrew Mashintonio, afm8@njit.edu, 337D CKB, Office Hours: T, R: 12:30-2:00pm

STUDY SUPPORT: Dr. Caroline Devan, cmd26@njit.edu, 337E CKB, Office Hours: T, R: 10-11:30am
Liz Cronin, ec83@njit.edu, 4th floor CKB, Office Hours: Please email for appointment

LECTURES: M, W: 10:00am-11:25am [CKB 303] –OR– T, R: 10:00am-11:25pm [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=2016s&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.

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 Attendance/Participation	65 points
Lecture Participation	35 points
Assignments/ Quizzes	120 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%

BIOLOGY 200 (002-016): CONCEPTS IN BIOLOGY

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
1/18	Mon/ Thurs - No Lecture Tues & Wed -Intro: Learning Styles, Class purpose/Goals	Discussion on Intelligence	
1/25	What is Biology? Graphing/Numbers & Figures	White-nose syndrome	HW1- Syllabus (5 pts) Pre- Quiz on Moodle Finish Graph for recitation this week
2/1	Evolution & MRSA Mechanisms of Evolution	Beak of the finch	HW2 Beak of the finch (10pts)
2/8	What is Flu? ▪ DNA Structure	Antibiotic resistance	Quiz 1 on Moodle
2/15	Transcription/Translation Gene Expression	Decoding the flu	HW3 MRSA (10 pts) Project 1, Part 1
2/22	Mutations ▪ Bioethnics	Bioethnics	Project 1, Part 2
2/29	Genetic Drift Phylogenetic Trees	SARS	HW4-Bioethnics (10 pts) Project 1, Part 3
3/7	Exam 1 ▪ Scientific Writing	Discuss Exam 1	
Mar. 13-20	SPRING BREAK: NO LECTURES OR RECITATIONS THIS WEEK		
3/21	What is DFTD? DNA Replication & Cell Division	No Recitations- GOOD FRIDAY	Project 1, Part 4
Mar. 25	GOOD FRIDAY- NO LECTURES- NO RECITATIONS		
3/28	Cancer Inheritance	Cancer genetics	HW5 Graphing (10pts)
4/4	Meiosis ▪ Population Genetics	Pedigrees	Quiz 2 on Moodle ▪ Project 2, Part 1
4/11	Community Diversity Interaction Networks	TBD	HW6- Ebola (10 pts)
4/18	Competition ▪ Predator-Prey	Food webs	HW7- Pedigrees (10pts) ▪ Project 2, Part 2
4/25	Parasites/Mutualisms Life History	Interaction web peer review	Quiz 3 on Moodle ▪ Project 2, Part 3 Post Quiz on Moodle
5/4-5	Other examples	No Recitations	Wed/Thurs - No Lecture (Reading Days)
5/6-12	Exam 2 - During Final Exam Week		Project 2, Part 4
FINALS	FINAL EXAM WEEK: MAY 6-12, 2016		

BIOLOGY 200 (002-016): CONCEPTS IN BIOLOGY

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.
- ⊕ Attendance at recitations is **required**. If you must miss recitation for a valid reason, please discuss making up the missed material with your recitation instructor as soon as possible.
- ⊕ Attendance and 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.

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.

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 contained in the lecture slides for that topic.

BIOLOGY 200 (002-016): CONCEPTS IN BIOLOGY

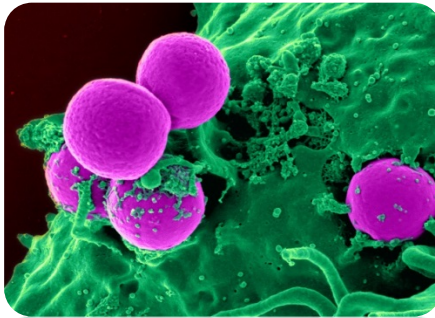


Figure 1 (left) – Human neutrophil (pseudocolored green) engulfing *S. aureus* bacteria (pseudocolored purple).
Image source
http://upload.wikimedia.org/wikipedia/commons/0/01/Human_neutrophil_ingesting_MRSA.jpg



Figure 2 (right) – Devil Facial Tumor Disease. Image of Tasmanian Devil suffering from a large tumor on its snout. Note that the tumor is obstructing the range of vision in one eye and likely causing difficulty in eating.
Photo: Rodrigue Hamende

EVALUATION

Assessment of Learning

1. **Learning Journal**- Every week, you will have an assigned prompt asking you to reflect on your own learning and progress in the course, to which you must respond via your personal forum on Moodle. Journal entries are assigned over the weekend. Only instructors can see your entries, and points are awarded (2 pts per weekly entry) for complete, thoughtful responses.
2. **Participation**- Participation in class discussions is essential to learning and you will be asked to communicate your thinking via several formats (aloud, iClickers, group work, in class assignments). Attendance and participation will be assessed in both lecture and recitation.
3. **iClicker Questions**- Lecture will include at least a couple clicker questions every day in order to track your understanding while we discuss topics.
4. **Homework**- There will be several homework assignments throughout the semester that will require slightly more in depth work on a topic, beginning the discovery and application of knowledge.
5. **Moodle Quizzes**- Over the course of the semester, there will be 3 quizzes (administered via Moodle) to assess your understanding of concepts that we have covered in class and your ability to apply that knowledge. You can also earn points for completing a Pre- and Post- Quiz.
6. **Projects**- Science often requires pulling together information from multiple sources to arrive at an end result. The course will include two projects that consist of several components that build towards a final goal.
7. **Exams**- There will be 2 exams that cover the application and understanding of the material covered in the course. These exams will also require you to apply the skills that we have emphasized.



Figure 3 (left) – *Borrelia burgdorferi*, the bacterium responsible for causing Lyme disease in humans. Image source:
http://www.3d4medical.com/Lyme-disease-bacteria-46-image_RM4612.html.



Figure 4 (right) - Influenza. Pseudo-colored transmission electron micrograph (TEM) of an influenza virion. CDC Public Health Image Library (PHIL) Photo: Frederick Murphy

BIOLOGY 200 (002-016): CONCEPTS IN BIOLOGY

SUCCEEDING IN BIOL 200

Learning is an active process, and it requires actively thinking, discussing and writing. Being successful at this process necessitates you understanding how you best learn biology. That requires thinking about more than just what you are learning, but how you are learning it. This is referred to as metacognition. Practicing this process will make you more efficient learners and better able to learn and integrate new material.

1. **Be Present.** You need to show up to class, but that means more than just being physically present in the room. Texting, sleeping, idly chatting with your neighbors, and surfing the internet all mean that you probably aren't really involved in class. Engagement in class activities means that you will learn more and struggle less when you work on your own later.
2. **Be Proactive.** This applies to a number of contexts. For example, cramming for an exam is something that students love to do, and sometimes it even feels vaguely successful –especially when memorization of something for short-term recall is the goal. Memorization of facts is not the point of this course though, so that strategy is even less likely to work here. Being proactive also means that you need to think about how you are doing and make an effort to improve. In other words, don't wait until you see your final grade posted online to care about how you are doing in the course.
3. **Talk.** Talking through an idea can help with your understanding. Discussion will be the focus of this course, so we will make you discuss things with your classmates, but talking things through shouldn't end when you walk out of class. Form study groups. Meet and talk about the class.
4. **Look at the Learning Outcomes.** We have provided our overall goals for you just above this section, and will include more specific ones throughout the semester. These are posted for your benefit to help guide your studying and illustrate what we think is important.
5. **Test Yourself.** Take some time to think about the material that has been covered in class. Potentially, ask yourself (or your classmates) questions like:
 - What were the main topics from this class session? (Objectives? Questions?)
 - What do I need to know in order to understand that concept, question or problem?
 - Can I break the topic into smaller parts? What parts can I explain in a manner that makes sense to me?
 - What parts are unclear or don't make sense yet?
 - How does today's class session relate to the larger goals of the course?

Clues to the answers to several of these questions will be found in the specific learning outcomes emphasized for each class/topic.

We want you to do well in this course. (Honest!) In fact, we want to help you develop skills in this course that will help you do well in every course you take from this point forward. So, don't treat these things as a chore you just have to do for this course. These are all suggestions that can be helpful in any class that you take.