

Topics: Medical Microbiology

Biology 109, Block 4, 2019

9-11 am and 1-3 pm, Russell Science Center 221

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<https://cbvolle.youcanbook.me/>
Availability: 8:00 am to 10:00 pm

Course Description

Just a few years after the discovery of penicillin, scientists described the first antibiotic-resistant bacteria. Today, there are bacteria resistant to all available antibiotics. In this course, students will learn about the basic tenets of microbiology, including microbial growth, genetics, and pathogenicity, by examining the problem of antibiotic-resistant super-bugs. In the laboratory, students will use classic and modern techniques to identify a variety of microbes.

In this course, we will explore how foundational concepts in biology apply to the study of microbes, with a particular focus on the development of antibiotic resistance. We will learn about these topics through active learning activities and discussions, so completing all the assigned work is important. We will also conduct laboratory research related to the topics, and you will be asked to design and carry out your own experiments. My hope is that this course will not only help you build your knowledge of microbiology, but allow you to develop an interest in scientific inquiry.

Course Goals

Students who complete this course successfully will be able to:

- Apply knowledge of basic cellular processes to microbial systems (Knowledge)
- Design experiments using the scientific method (Inquiry)
- Communicate scientific concepts to a general audience (Communication)

Course Support of Educational Priorities and Outcomes of the College

This course supports the following Educational Priorities and Outcomes of Cornell College in the following ways:

- Knowledge: We will learn about foundational concepts of biology and how they apply to the study of microbes and human health. Students will be given test questions to evaluate their mastery of different subjects.
- Inquiry: Using structured experiments as a template, we will develop original research questions related to the class topics. We will then perform experiments designed to answer those questions. Students will be evaluated on their ability to analyze the data generated from laboratory experiments and their ability to construct an experiment that

answers their experimental question.

- **Communication:** We will present relevant scientific information written for patients at the health center. Students will be evaluated on the content, clarity, and usefulness of their patient pamphlets.

Required Texts, Materials, or Equipment

- There is no required textbook for this class. Readings will come from a variety of open access textbooks and from the scientific literature. You will occasionally be asked to watch a video as well. All the course materials are available on the course Moodle page.

Daily Work/Homework

My previous students will tell you that it is a mistake to think my courses are easy. My courses are fair, and there is a big difference between the two. My general philosophy is that if you do all the work required of you, you will get a good grade. There is assigned reading and an accompanying quiz for almost every class period. The best way to succeed in this class is to work at it every day, rather than trying to cram everything in before an exam. Please remember that I am a resource, but one that has autonomy. Do not wait to come see me, because I might not be available, and then where will you be?

Major Assignments

Exams: There are three exams in this course (see schedule). I will give you a review sheet containing questions that will make up 50% of the exam. Exams are not necessarily cumulative, but you may need information covered on a previous exam to answer some of the questions. We will have a review session during the afternoon class preceding the exam. I will not answer direct questions about the review questions, but I am happy to review the topics related to exam questions.

Homework: There are three homework assignments due. Questions will be drawn from any topic that we have covered.

Patient Information sheet: Sharing what you learn with others is an important skill to develop. You will be asked to make three patient information sheets that can be used on campus. Please see the associated handout for more information.

Lab reports: Each lab has a series of questions designed to demonstrate your grasp of data analysis and your understanding of laboratory procedure. Please see the schedule for due dates.

Class Participation

There are several ways in which class participation will be evaluated. The first is simply showing up to class. Second is completing the reading quizzes as assigned. We will have an in-class reading quiz each morning that there is reading due. I will give you 5 minutes to complete the quiz and you may use the reading and any notes you have taken. Third is

actively participating in the laboratory. Even when you are working as partners, each partner should be actively involved.

Course Grading

Statement of Grading Process and Criteria:

Grades will be determined using answer keys and rubrics. Rubrics are included for each project and answer keys will be distributed once grading is complete. I do not grade on a curve, nor do I give extra credit. However, I do give partial credit on tests, so please never leave a question blank. If you are worried about your grade, please come speak with me, so we can figure out what's going on. Also, don't trust the overall grade you have on Moodle. Moodle is a convenient place to see your scores, but it may think you have a zero on any assignment that isn't due yet.

Explanation of Grading System:

- Exam 1: **100 points**
- Exam 2: **100 points**
- Exam 3: **100 points**
- Patient handouts: **150 points**
- Quizzes: **130 points**
- Homework: **120 points**
- Lab reports: **200 points**
- Attendance: **100 points**

Letter grades:

A	94%	Excellent
A-	90%	Mostly excellent
B+	87%	Better than good
B	84%	Good
B-	80%	Mostly good
C+	77%	Better than OK
C	74%	OK
C-	70%	Mostly OK
D+	67%	Partially unacceptable
D	64%	Mostly unacceptable
D-	60%	Completely unacceptable
F	<60%	Did not complete the work

Course Policies and Information for Students

1. ATTENDANCE POLICY

Students are expected to attend all lectures and labs. If you have a legitimate reason for missing class or a deadline, please send an e-mail to me before class begins. For each unexcused absence (no notification before morning or afternoon class begins), 10 points will be deducted from your final point total.

2. PENALTIES FOR LATE WORK and REQUESTS FOR EXTENSIONS

Because you know about every assignment from the start of class, I do not accept late work. However, I do understand that we all have lives outside of class and sometimes extensions are necessary. If you need an extension, please come see me before the work is due so we can do our best to make alternative arrangements.

3. POLICIES ON MISSED EXAMS, MAKE-UP EXAMS

If you know ahead of time that you will miss an exam, you must make every effort to take the exam early. If you unexpectedly miss an exam, you must make it up within three days of the exam date. This is in fairness to your classmates, as they can't receive their exams back until everyone has completed the exam.

4. TECHNOLOGY POLICIES:

You are welcome to use your laptop/phones in the classroom as long as they are being used for class work only. If there is an issue, you will be asked to leave your laptop/phone outside the classroom. Please do not wear headphones in class, and make sure all technology is set to silent.

5. DROP POLICY

You may drop the course at any time in the first three days. In order to drop the class on the fifteenth day you must have attended all classes, completed all assignments, and, based on my analysis of your work, put the appropriate effort into learning the material.

6. DISABILITIES AND ACCOMODATIONS POLICY: Cornell College makes reasonable accommodations for persons with disabilities. Students should notify the Office of Academic Support and Advising and their course instructor of any disability related accommodations within the first three days of the term for which the accommodations are required, due to the fast pace of the block format. For more information on the documentation required to establish the need for accommodations and the process of requesting the accommodations, see <http://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml>.

7. ACADEMIC HONESTY POLICY: Cornell College expects all members of the Cornell community to act with academic integrity. An important aspect of academic integrity is respecting the work of others. A student is expected to explicitly acknowledge ideas, claims, observations, or data of others, unless generally known. When a piece of work is

submitted for credit, a student is asserting that the submission is her or his work unless there is a citation of a specific source. If there is no appropriate acknowledgment of sources, whether intended or not, this may constitute a violation of the College's requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in The Catalogue, under the heading "Academic Honesty."

The instructor reserves the right to change the policies, topics, or topic order at her discretion after informing the class.