

CEDAR CREST COLLEGE
Biology 227 Microbiology
Course Syllabus - Part I - Overview
Fall 2008

I. INSTRUCTOR INFORMATION

Instructor: Dr. Amy J. Reese
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Office Hours: Mon. 1–1:50 pm, Tues. 1–1:50 pm, Wed. 3:30–4:20 pm, Thurs. 12:00– 12:50 pm.
Other hours by appointment.

II. GENERAL COURSE INFORMATION

Biology 227: Microbiology, 4 credits (lab and lecture must be taken together)
Electronic features: This course has an ecompanion component and will make use of “clicker” technology. My website is: <http://www2.cedarcrest.edu/academic/bio/areese/>.
Course Prerequisites: Completion of Bio 121, Bio 122, Che 111, and Che 112. As of fall 2009, Bio 227 will also require completion of the new sophomore core, Bio 235 and 236.

Course Description:

A survey of microbial life including bacteria, fungi, protozoa, and viruses (with an emphasis on bacteria). Topics covered include microbial characteristics, physical and chemical control, metabolism, enzymes, regulation of enzyme activity, bacterial genetics, bacterial diversity, host-microbe interactions, and applications of microbiology. The laboratory includes aseptic technique, staining procedures, culture methods, cultural and physical characteristics, microbial control, microbiology of food, water and soil, microbiology of the body, and identification of unknowns. Lecture three hours, laboratory three hours.

Textbooks and materials:

- **Required for lecture:** Marjorie Kelly Cowan and Kathleen Park Talaro, *Microbiology: A Systems Approach*, 2nd ed., McGraw Hill, 2009 (ISBN 978-0-07-299528-2).
- **Required for lecture:** Radio frequency (RF) keypad “clicker” sold at the bookstore.
- **Required for lab:** Michael J. Leboffe and Burton E. Pierce’s *Microbiology: Laboratory Theory and Application*, 2nd ed., Morton, 2006 (ISBN: 978-0-89582-708-1).
- **Required for lab:** W.H. Freeman & Company paperback Laboratory Notebook with carbonless grid paper (ISBN: 0716739003) or equivalent carbonless notebook.
- Highly recommended: Index cards for study flash cards, colored pencils for descriptive laboratory drawings, a two pocket folder or binder to hold pre-lab materials and notebook copy pages.

Format:

Lecture 3 hours per week in Oberkotter Center for Health and Wellness, lecture hall (OBC-1)
Laboratory 3 hours per week (in two 1.5 hour sections) in OBC-2

Schedule:

The specific lecture and laboratory schedule and topics list can be found on the separate handouts *Biology 227 Microbiology– Course Syllabus – Part II - Lecture Schedule & Policies* and *Biology 227 Microbiology – Course Syllabus – Part III – Laboratory Schedule & Policies*

Course Objectives:

At the successful completion of the course, you should be able to:

1. Explain the general characteristics of archaea, bacteria, protozoa, algae, yeast/mold, and viruses.
2. Understand the roles that microorganisms have in the scheme of life, and that they are ubiquitous.
3. Cultivate bacteria and understand their nutritional and physical requirements.
4. Understand the general aspects of bacterial enzymes, their regulation, and their energies.
5. Understand the general aspects of microbial metabolism and be aware of the metabolic diversity that exists.
6. Understand the basic principals of bacterial genetics.
7. Select the proper physical and chemical methods to control microorganisms.
8. Be aware of the roles that microbial life plays in the environment, in various biotechnical applications, in human health, and the careers and jobs that study and address these roles.
9. Perform laboratory techniques aseptically and safely.
10. Perform various staining techniques.
11. Perform bacterial dilutions and plate counts.
12. Recognize different bacterial types, protozoa, and fungi microscopically.
13. Prepare bacteriological media.
14. Isolate and identify a Gram+ or Gram- organism unknown.

III. COURSE OUTCOMES & ASSESSMENT

Course Outcomes:

1. With a successful completion of the course, you will learn the principles of microbiology that are in line with the goals of the Education Division of the American Society for Microbiology. You will also be introduced to a range of careers and applications in microbiology.
2. You will use and demonstrate critical thinking and reasoning skills to isolate and identify a bacterial unknown sample.
3. With successful mastery of the laboratory, you will be able to function in a laboratory requiring media preparation, aseptic technique, and the isolation, staining and culturing of bacteria. You will also have been exposed to other microbiological techniques.

Assessment:

1. Throughout the semester, you will be given the opportunity to complete class preparation questions, homework assignments, class quizzes, projects, and several in-class activities (for which you must prepare out of class) to practice and apply your skills in preparation for lecture exams.
2. You will take three major lecture exams and a comprehensive final exam on the microbiology content areas.
3. You will submit one unknown report that includes the laboratory tests performed, the results of the tests and a discussion that analyzes the methodology and suitability of the identification of your unknown.
4. Throughout the semester, I will evaluate your laboratory notebook and pre-lab preparation on unannounced occasions. I will also inspect the stains and tests of your unknown organism and other samples to provide feedback on your note-keeping skills and laboratory techniques.
5. Six quizzes and two practical exams will be given in the laboratory to assess your ability to properly interpret microbial tests.
6. During the time scheduled for the comprehensive final, the laboratory component of the exam will be open notebook.

IV. STUDENT ASSESSMENT & EVALUATION

Grading:

Course work will be evaluated on a percent scale as follows.

30%	3 lecture exams
15%	Lecture participation and preparation including: <ul style="list-style-type: none"> - Homework assignments, in-class quizzes, class preparation questions - Adopt-A-Microbe lecture in-class participation & project preparation (poster presentation) on a prokaryotic topic - Adopt-A-Microbe lecture in-class participation & project preparation on a non-prokaryotic microbial topic (original letter, peer critique, draft 2, high school student critique, final)
10%	Laboratory unknown report
10%	2 laboratory practicals
15%	6 lab quizzes, evaluation of lab safety & performance, notebooks & prelabs
20%	Cumulative final exam (including a laboratory component that is open notebook)
100% total	

Your percentages from the above list will be totaled and used to compute your final grade.

Final grade %	A	A-	B+	B	B-	C+	C	C-	D+	D	F
	93-100	90-92.9	87-89.9	83-86.9	80-82.9	77-79.9	73-76.9	70-72.9	67-69.9	60-66.9	<60

V. COURSE POLICIES AND STUDENT RESPONSIBILITIES

A. Academic Policies:

1. I fully support the “Honor Code” and “Honor Philosophy” set out by the *Cedar Crest College Student Handbook*.
2. I fully support the “Academic Standards of Integrity” and the “Statement on Academic Dishonesty or Plagiarism” set out by the *Cedar Crest College Student Handbook* as a part of the “Community Standards for Academic Conduct” (Section A, part I). This means but is not limited to the following statements.
 - Plagiarism will result in a zero for the assignment.
 - Cheating in lecture or lab will result in a zero for the test/assignment.
 - Plagiarism and cheating violations will be reported to the Provost, Academic Services, and/or the Honor & Judicial Board, and may result in failure of the course.
 - Violations or violation intensions of these statements should be brought to my attention.
 - I will report violations of “Academic Standards of Integrity” and incidents of “Academic Dishonesty or Plagiarism” as necessary.
3. I fully support the “Classroom Protocol” addressed in the *Cedar Crest College Student Handbook* (“Community Standards for Academic Conduct” Section A, part I). I expect the classroom to be an environment in which all students can participate and learn. Behaviors that detract from this ideal environment (as listed in the “Classroom Protocol,” mentioned below and as decided upon by the class should be avoided at all costs.
4. Please refrain from all activities that detract from the learning of others around you. This includes but is not limited to the following areas. Please silence cell phones during class unless there is an impending emergency, do not routinely come to class late, do not eat or talk in ways that are distracting to those around you, and do not leave the classroom except for the bathroom or related emergencies. Reasonable interruptions should be cleared in advance.

B. Lecture Attendance Policies:

1. You are expected to attend lecture and to come to class prepared. Attendance will be documented. Extended unexcused absences may result in up to a 10% reduction of the total lecture grade. Unexcused absences for lecture exams or finals will result a zero for that exam.
2. In the unfortunate event of an unplanned absence due to a personal or family medical emergency, you must contact the Acting Dean of Student Affairs (Denise O’Neill: 610-437-4471, x4680; doneill@cedarcrest.edu) to obtain appropriate documentation for an excused absence. These offices will contact me. You should also contact me to make alternative coursework plans.
3. For expected absences or early departures due to Cedar Crest-sanctioned events, please notify me as soon as possible and see your coach or instructor for official documentation in advance.
4. You are expected to be at lecture on either side of Thanksgiving break. Scheduling family vacations during the non-break sections of the semester is highly inadvisable.
5. It is your responsibility to obtain notes and handouts from a classmate for any missed material for lecture absences. If you miss class on a day on which an assignment is given, it is your responsibility to get a copy of the uncompleted assignment from a classmate. If you miss class on a day on which an assignment is due, it is your responsibility to get the assignment in on time or as soon as possible (to minimize your deducted points).

C. Laboratory Attendance Policies:

1. Laboratory attendance is mandatory by college policy. Each unexcused absence will result in a 10% reduction of your total laboratory grade. Each excused absence without made up work will result in a 5% reduction of your total laboratory grade. Each unexcused absence with made up work will also result in a 5% reduction of your total laboratory grade. See point #4 and its sub-bullets below. Unexcused absences on the day of a practical will result in a zero for that exam.
2. For expected absences or early departures due to Cedar Crest-sanctioned events, please notify me as soon as possible and see your coach or instructor for official documentation in advance. You are responsible for coordinating with me as to how to make up any missed lab work.
3. Expected absences for special extenuating circumstances must be discussed in advance with the Dean of Student Affairs. You are expected to be at lab on either side of Thanksgiving break. Scheduling family vacations during the non-break sections of the semester is highly inadvisable.
4. Only emergencies or special circumstances will be allowed as reasons for any make-up lab. Any adjustments must fulfill the following 3 requirements:
 - You must notify me on the day of or before the lab. This should happen before the time of the scheduled lab, pending valid emergencies.
 - There is official documentation (from the Health Center, Dean of Academic Affairs, or Academic Services) that is considered valid (at my discretion).
 - The lab must be completed within 48 hours of the absence. It is your responsibility to contact me as soon as possible to schedule any approved make-up lab. Due to the nature of laboratory work, lab partners, and supplies, some labs may not be able to be made up as performed in class.

D. Lecture Assignment, Lab Assignment & Notebook Policies:

1. Assignments are to be done as scheduled and work to be handed in before the beginning of the class in which it is due unless otherwise instructed. Up to 10% of the assignment grade will be deducted for each weekday for which the assignment is late.
2. If you miss class on a day on which an assignment is due, it is your responsibility to get the assignment in on time or as soon as possible (to minimize your deducted points). If you miss class on a day on which an assignment is passed out, it is your responsibility to get a copy of the uncompleted assignment from a classmate.
3. Do not use pink or red ink/pencil for assignments you will be turning in.
4. For some assignments, you may be allowed to work with a friend. You must still submit separate work and indicate the student with whom you worked. If not indicated or instructed, you are to work alone.
5. This course has an ecompanion component. You can access any review questions and additional suggested readings associated with the class through Cedar Online (cedarcrestonline.net). You may be asked to submit assignments or other work through ecompanion.
6. As in a scientific research lab, notebooks remain in the lab and entries are only made there. Similarly, your notebook must remain in the lab during the course (you may remove it at the end). By using the carbonless notebook, you may remove the tear-out pages for study purposes. At any point in time, your notebook may be checked and graded. If your notebook is not in the drawer at the time of grading, a zero will be recorded for that notebook grade.

7. Pre-laboratory assignments (pre-labs) and/or quizzes will be made available to you to help you prepare for each lab. These should be completed and brought into lab each time or as instructed. They can reside in a folder or notebook with pages removed from your lab notebook. At any point in time, they may be collected or monitored and graded (if not graded electronically). If your pre-lab is not completed at the time of evaluation, a zero will be recorded for the pre-lab. You may also be asked to leave the lab to complete the pre-lab before being able to proceed.
8. Your laboratory unknown work is to be handed in and picked up as instructed. This work is only your own, although you may seek guidance from the instructor and course IA.

E. Lecture & Laboratory Quiz, Exam & Final Exam Policies:

1. As with other laboratory courses, there are different lab sections. You are expected to not share or discuss any laboratory quiz, practical, or related materials with others in another section.
2. “Clicker” quizzes may occur at any point during a class and at any point throughout the semester. If you miss a quiz, you will forfeit the points associated with that quiz. These quizzes cannot be made up. There will be extra points associated with this portion of your grade such that missing only 1 quiz should not have significant impact your grade.
3. If you arrive late for an exam or quiz, in lab or lecture, you forfeit that time in taking the test.
4. You are expected to sit with a space between you and the next student whenever possible and may be given exam seat assignments.
5. You are expected to be at each exam on time and as scheduled. Only emergencies or special circumstances will be allowed as reasons for any make-up. Any adjustments must fulfill the following 3 requirements:
 - You must notify me on or before the day of the exam. This should happen before the time of the scheduled exam, pending valid emergencies.
 - There is a documented (from the Health Center, Dean of Student Affairs, or Academic Services) reason that is considered valid (at my discretion).
 - The test must be completed within exactly one week of the absence or as otherwise arranged. It is your responsibility to contact me to schedule any approved make-up exam, and this should be done as soon as possible.
6. Without a legitimate and credible excuse on or before the test day, you will receive a zero for that test.
7. Some make-up exams may not necessarily correspond to the regular test format. They will be given at a designated time and may also be scheduled during the week of final exams.
8. Before each exam, all material must be placed in the front of the room or as otherwise directed. Purses, papers, notebooks, books, PDAs, cell phones, headphones, guests, calculators or other devices are not allowed unless otherwise directed. Exams should be in ink (not red or pink).
9. Your obligation for this course includes attendance at the final exam on the day and time scheduled by the Registrar’s Office. You should not make travel arrangements (nor should your family make them for you) until the final exam schedule is published. If you must make plans early, you should schedule your travel after the last final exam day.
10. Unexcused absence for the final exam will result in a zero for that exam.

11. Final exam times cannot be rearranged unless three or more exams occur within a 24-hour period. Any exception must be petitioned and reviewed by the Department of Biological Sciences within a week of when the final exam schedule is announced in class.

F. Academic Services:

1. Disabilities Services

- Students with disabilities who wish to request accommodations should contact the Advising Center and visit the site http://www2.cedarcrest.edu/acadadvising/ada_file.html within the first two weeks of class.

2. Academic Support

- The Advising Center provides many resources, such as study skills resources and peer tutoring, through their website <http://www2.cedarcrest.edu/acadadvising/index.html>, via email at advising@cedarcrest.edu, on campus site in the Curtis 109, or by phone at 610-606-4628.

3. Course resources

- Danielle Pilla is the Instructional Assistant (IA) / Teaching Assistant (TA) student associated with both Bio 127 and Bio 227 lecture sections and all lab sections. Her meeting hours and locations will be posted and announced.
- There is no extra credit associated with this course.
- There is a sense of microbial fun and exploration associated with this course!

STRATEGIES FOR SUCCESS

1. Do come to class and lab ready to participate.

- Read assigned text material before class to get an idea of the terminology.
- Review notes on a regular basis to be prepared to build on that material.
- Review notes from previous classes before the next class.
- Make sure to be prepared to discuss specific assignments in the next class as directed.
- Know what lab tests you'll be doing that day and why when you come to lab.

2. Do ask for help if you are having trouble.

- An instructional assistant (IA) for lab and teaching assistant (TA) for lecture is available.
- The IA is named _____ and the hours/locations are:

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- Some of the best students have been ones that have used this resource regularly.
- Individual tutors are also available, contact the Academic Advising Center.
- If you are having troubles preparing for the course, email me or visit during office hours.

3. Do make comprehensive connections, which goes beyond memorization.

- Use homework assignments to help review and connect material.
- Memorization is step one. Connection of the material and concepts is step two.
- Think of it this way. A recital is like memorization and you practice specifically for it. Science is always changing. I want you to learn to sightread!

4. Do regularly attend classes

- You can read the book (and you should), but you wouldn't want to rely on the book alone.
- In class we'll highlight the points that you should focus on. I test from my class notes.
- Tips and key information may also be given in class.
- Besides, I say and do silly things in class that you don't want to miss!

5. Do study every day and along the way!

- Avoid "binge studying"
- If you practice, you'll know where you have troubles before the exam.
- Write your own test questions to help you review one day, try to answer them the next.
- Flash cards may be good for some, but they are only a start to memorization.
- Study with someone else (see if s/he can answer your questions), it helps with connections and makes it fun.