

Biology 106 (Microbiology: Unseen Life) Syllabus - Spring 2005

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Lecture: Gottwald A201 - MWF 8:15 – 9:00
Lab: Gottwald B218 - Tues or Wed. 1:35-3:35
Office hours: Gottwald B213: Thurs 8:00-9:00, by appointment, or drop on in if my door is open

MATERIALS REQUIRED FOR THE COURSE:

- Access to Blackboard: <http://blackboard.richmond.edu/>
- Access to I. Edward Alcamo, *Microbes and Society: An Introduction to Microbiology*, Jones and Bartlett Publishers, ISBN: 0763714305
- Notebook for the laboratory

COURSE GOALS:

Microorganisms (or microbes) are organisms that can not be seen with the naked eye, and are frequently single-celled. They are the most numerous, most diverse and most important organisms on earth. Species of bacteria have been found that can live at temperatures above the boiling point and below the freezing point. As a group, microbes can metabolize almost any compound. They can be friend or foe: microbes are essential to the biogeochemical cycling of elements on our earth, and yet a single microorganism can kill a human. The mechanisms by which microbes perform all these and many other unique functions are biologically interesting, and their impact on our world is unsurpassed by any other group of organisms.

The overall goals of this course include the following:

- **To introduce you to the unique aspects of biology of microbes.** In one semester we cannot even begin to scratch the surface of the entire field of Microbiology. Thus, we choose representative topics on which to focus our attentions as we explore a wide range of questions related to microbiology. These include: Who are the microbes and how are they classified? How do microbes grow? How can we control microbial growth? How can we harness the power of microbial genetics? How do microbes help in food production? What roles do microbes play in the biosphere? How do microbes and the human body interact? Additionally, you will have the opportunity to explore topics that you are interested through a variety of open ended course assignments.
- **To explore the role microbes play in our world.** The contributions of microbes to the world, both positive and negative, will be highlighted through out the course.
- **To help you understand the process of scientific endeavor.** Science is a process which seeks to construct a non-arbitrary, truthful representation of the world. The process of science may take many forms. We will use microbiology as a paradigm to explore the nature of science, what scientists do, and how science impacts our society.
- **To convince you that, in their unique way, microbes rule the earth!**

COURSE AUDIENCE AND PREREQUISITES:

BIOL106 is fulfills the UR field of study requirement for natural science (FSNB). The course is intended for students who do not plan to major in Biology and thus, **BIOL106 does not count towards the Biology major requirements**. I will assume that you have some background in high school biology and chemistry. If you have not had high school chemistry and biology, please let me know.

COURSE SCHEDULE AND FORMAT: We will have a mixture of lecture, in class activities, in class discussions, and laboratory activities. The schedule is attached as a separate document.

EVALUATION OF PERFORMANCE:

100 points exam 1	100 points pamphlet Assignment
100 points exam 2	100 points microbial musings Assignment
100 points exam 3	100 points lab report (Lab 2)
150 points final Exam	100 points lab report (Lab 3)
100 points quizzes/homework	50 points preclass preparation assignments

Please remember that college is about learning, not getting a certain grade. That being said, I still have to assign you a grade at the end of the semester that reflects what you have earned in the class. Accumulation of 900 points (90%) will earn you an A; 800 points (80%) = B; 700 points (70%) = C; 600 points (60%) = D; 500 points (50%) = F.

GENERAL COURSE INFORMATION:

- **There are no make up exams or quizzes.** The only exceptions to this are as follows: (1) Conflict with a religious holiday observance (Note that this **MUST** be brought to my attention the FISRT week of class, otherwise this is not a valid exception.) (2) Death of a family member. (3) Illness that requires hospitalization or is accompanied by a medical professional's note. (4) Valid university activity. (5) Interviews for post-grad activities. If you arrive late, you will not be given extra time.
- I expect that you will be present during class both physically and mentally. You will learn the material better if you are in class each day.
- **Attendance in lab is required.** If you miss a lab, 10% of the FINAL course grade will be deducted from your final grade. Once again, only the above exceptions apply.
- Homework will NOT be accepted late and quizzes can NOT be made up. Once again, only the above exceptions apply.
- **Technology failures are not acceptable excuses for late work:** What this means to you is backup your files and do not wait until an hour before class to print out the file.

GENERAL LABORATORY INFORMATION

1. **Purpose:** The laboratory exercises are designed to help you relate the material covered in lecture with actual experimental techniques.
2. **Correlation with class lectures:** The laboratory experience is not a separate course unrelated to the lecture component. One of the goals of the laboratory exercises is to help you relate the material covered in lecture with actual experimental techniques. Thus, it is important that you do the background reading for each laboratory exercise. Also, the principles behind each laboratory exercise will be introduced in the laboratory exercise handout, and we will talk about them at the beginning of each lab period.
3. **Out-of-class preparation/work:** Many of the laboratory experiments will take the full two hours, especially on days on which you must examine your results from previous laboratory experiments and start the new experiments for the week. To use your time most efficiently and to avoid making costly mistakes, it is **ESSENTIAL** that you come to the laboratory prepared to do the work. At a minimum, you should have read the laboratory exercise handout. You may also find it helpful to do background reading in your lecture textbook on the specific topic covered. **There may be lab quizzes to ensure that you have read the labs before the lab session.** Additionally, for some laboratory exercises, you will need to return to the laboratory on days other than the assigned laboratory period to check your experiments. This reflects the nature of working with microbes.
4. **In-class record keeping:** To intelligently analyze and write about your experiments, it is critical that you keep careful records of the results you obtain. Once your plates, tubes, samples, etc are discarded in the biohazard waste container, it will be impossible to go back and check for any mistakes that you made.
5. **Laboratory safety:** Any microorganism has the potential to cause disease, given the right host and right environment. Thus it is **ESSENTIAL** that you adhere to the safety procedures outlined on the safety handout. **Please note that if you are immunocompromised for any reason, you should (1) discuss the risks of lab work in the course with your physician and (2) notify me.**
6. **Laboratory partners:** Laboratory partners will be randomly assigned. This is not an attempt to keep you and your best buddy from being partners; instead, it is meant to simulate the **REAL WORLD** where one does not always get to choose with whom he or she will collaborate. It is essential that you develop skills that are related to working with other people. Thus, you and your laboratory partners will work together and will share and discuss data. However, the written laboratory assignments are to be done separately.
7. **Attendance:** Please note that laboratory attendance **IS MANDATORY** at every session. If you can not attend a laboratory session for a legitimate reason, please contact me. Otherwise, you will lose 10% of the final course grade. Also, any information covered in lab is fair game for lecture exams.

HONOR CODE:

The School of Arts and Sciences, the Jepson School of Leadership Studies, the The E. Claiborne Robins School of Business each operates under the University Honor Code Statute. Breaches of the code are cheating, plagiarism, lying, academic theft, disclosing honor council information, registration irregularity, and failure to report an Honor Code Statute violation. Any person who violates these standards shall be subject to disciplinary action ranging from reprimand up to and including expulsion from the University. Determination of guilt or innocence and imposition of sanctions, when necessary, will be effected according to established procedures, with procedural fairness observed, and with appropriate appeal procedures available. (University of Richmond Undergraduate Catalog, 2002-2004, page 21)

How does the honor code apply in this course? While you are encouraged to discuss course material with others, all graded assignments must be your own work unless you are informed of an exception to this rule.

Work that you are encouraged to do **as a group**:

- Planning lab experiments
- Performing lab experiments
- Compiling the results of an experiment
- Discussing and interpreting the results of an experiment
- Discussing lecture notes
- Doing problems

Work that you are expected to accomplish **on your own**

- Calculation and analysis of experimental data
- Composing tables and graphs of data
- All written assignments (exams, lab reports, etc.)

Please include the following signed Honor Pledge on all work that is handed in: "I pledge that I have neither given nor received unauthorized assistance during the completion of this work."

STUDYING FOR EXAMS

Content of exams:

The majority of the questions will short answer, essay, or analysis and interpretation of data. All of the questions are designed to test your comprehension and understanding of the material presented in class and assigned as readings. Additionally, I strive to provide you with test questions that allow you to demonstrate your ability to make connections between the chapters and between lecture and lab. I try not to give simple memorization questions, because I do not think that these test your understanding of the material. However, you must know all the terms, definitions, etc to understand the material. You are responsible for all the material in the chapters, lecture notes, assigned reading and laboratories unless otherwise indicated. Although each exam focuses on a different set of material, the exams are cumulative in the sense that you are responsible for understanding material covered in previous chapters.

Suggestions for effectively learn/understand the material in BIOL106

1. Ask questions in class and out of class.
2. Read (or at the minimum skim) the reading assignments before class and review carefully after class.
3. If it helps you in note taking, bring PowerPoint slides (from web) to class.
4. Consistently spend time on this class throughout the semester (not just the week before the exams/assignments). You should expect to spend 2-3 hours per class hour on this course.
5. **Don't procrastinate.** You will not be able to truly understand between the material if you wait until the last minute to learn it. This means that you probably will not do well on my exams since they test your ability to solve problems and interpret/analyze data. These skills require practice and thorough comprehension, neither of which can be crammed into your brain the night before an exam.