Course Description

This is a very exciting time to be studying microbiology! The advances in the field are amazing. We understand so much more about microscopic life forms and their impact on life on Earth. The last couple of decades have seen a complete revolution in our understanding of microbes and their relationship to us and our environment. Largely due to novel sequencing techniques, we are getting a more complete picture of the microbial world – and it is clear that they are everywhere, and they form very diverse communities! In this class, we will be looking at the interesting advances in the field of microbiology, and you will be getting a better understanding of microbial communities and their impact on our world. The broad topics we will cover include: the microbial cell, genes and genomes, metabolism and biochemistry, microbial diversity and ecology, and medical microbiology.

Learning Outcomes

Upon completion of this course, you should be able to:

○ Explain the general characteristics of a prokaryotic and a eukaryotic cell, and explain the differences between them.
○ Explain culturing and the factors that influence microbial growth.

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Office hours: MW 1-4 and T 9-10 by appointment

Welcome to Intro to Cell and Molecular Biology!
A little bit about me: I am a microbiologist, biochemist and bioinformatician. I got my Ph.D. in Biochemistry from the University of Houston and did postdoctoral work on computational biology and experimental evolution at Rice and UH. My research interests include microbial ecology, genome evolution, how organisms exchange genetic information, and the DNA damage response.

This syllabus is an important document. It explains what you can expect from the course, and my expectations of you. It is important that you read and understand it. Please ask questions if there is anything that is unclear.
- Explain the differences in genome organization between prokaryotes and eukaryotes.
- Explain the role of bioinformatics in our understanding of microbial communities.
- Explain how bacteria regulate gene expression.
- Explain how microorganisms obtain energy and build biomolecules using different metabolic approaches.
- Describe some of the hypotheses for the origin of life on this planet, and the role of gene transfer on the evolution of life.
- Describe the general traits of the main groups of microbes and viruses.
- Explain how microbes affect the environment and our bodies.
- Explain the basis of microbial pathogenesis.

**Textbook**


**Topics covered this semester**

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<thead>
<tr>
<th>Lecture Topic</th>
<th>Chapters</th>
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<td>Bacterial growth</td>
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<td>Genome organization, evolution and sequence analysis</td>
<td>7-10</td>
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<td>Microbial metabolism</td>
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<td>Microbial origins and diversity</td>
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<td>Microbial ecology</td>
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<td>Medical microbiology</td>
<td>23, 25-28</td>
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**Important dates**

Below are important dates for the semester. Please note that these are fixed and will not be changed.

- Exam I: 9/16
- Exam II: 11/4
- Student Presentations: 12/2 and 12/5
- Final Exam: 12/12 (11-1:30 pm)
How do I earn my grade in this class?
Below are the assessment materials used to determine your grade in this class. Opportunities for extra credit may arise at the discretion of the instructor throughout the semester.

**Quizzes (100 points):** Group and individual quizzes covering each module will be given in class. Each quiz is worth 10 points, for a total of 10 quizzes throughout the semester.

**Group Assignments (100 points, may vary):** There will be several in-class group assignments that require active participation and will be graded. Details about these assignments will be announced in class and attendance is required to get the points.

**Exams (300 points):** There are two exams (each worth 100 points and a cumulative final exam (100 points). The format for all exams is multiple choice, short answer questions and essays. **Exam dates are fixed** (refer to exam schedule above), but the subject matter covered in each may vary and will include only material that has been covered – you will not be tested over material that has not been discussed in class! Please note: unless there is a valid excuse due to an emergency or unforeseen circumstances, **no make-up exams are given** - it is your responsibility to ensure that exam dates are not missed. Please note: if you require special accommodations for taking exams, you should schedule an appointment at the Testing Center. You are responsible for scheduling your exam and you must notify me **one week in advance** of the arrangement. This ensures I have enough time to get an exam copy over to the center. The Testing Center is located in the office of Career Services and Testing on the second floor of Crooker Center. You can call (713) 525-3160 to schedule an appointment.

**Service Learning (100 points):** This class is listed as a Service Learning Course. You will be required to participate in a service project for a minimum of 10 hours in the community. You will also put together a brochure and group presentation describing your project. More details will be discussed in class and are provided in a separate handout.

Please note that University policy **prohibits posting of grades by the professor.** Grades will also not be discussed over email. Final grades for the course will NOT BE DISCUSSED until after they have been posted by the Registrar's Office at the end of the semester.
Keep track of each assignment so you can calculate your grade at any time. Your final grade is based on the percentage of total points earned and is calculated using the following scale:

- **100-94** A
- **93-90** A-
- **89-87** B+
- **86-84** B
- **83-80** B-
- **79-77** C+
- **76-74** C
- **73-70** C-
- **69-67** D+
- **66-64** D
- **63-0** F

**Active learning**

A lot of research supports the fact that students get more out of their classes when they are active rather than passive learners. This class is designed to include active learning activities that will help you **apply** the material and develop your critical and analytical skills. A huge emphasis is placed on you being able to **use your knowledge** to solve problems, rather than simply regurgitate facts that you memorize. While this is an introductory class and some memorization is required, particularly of terms readily used in the discipline, you will also be spending a lot of time doing **higher order thinking** that forces you to take that extra step so that you are learning and not just memorizing the material. Doing this ensures that you will **retain** much of the knowledge you get from the course, so that you have a solid foundation that you can build on in other upper division courses.

Some of these active learning activities and exercises will involve **group work**. Working with others is an important skill to develop since much of your professional life, no matter what your career choice, will involve interacting and working with people who might think and act in ways very different to your own. Everyone in a group has a different set of strengths and weaknesses, and everyone has something worthwhile to contribute. Team analysis and discussion can be powerful learning tools, so take advantage of this opportunity!
Other important things you need to know

**Attendance:** Do not expect to do well in class if you miss our meetings. You should take this seriously. You learn a lot by going to class – not only about the material, but also about listening, sorting through topics, note taking, and working with others. Unless you have a medical or otherwise official excuse, you will not be allowed to make up missed in-class assignments. As dictated by university policy, four or more absences may result in an “F” grade for the course.

**Electronics:** You may use a laptop or electronic device to take notes during lecture. This privilege will be revoked if you are caught using these devices for anything other than class. Please make sure that all phones are set to silent during class time. ABSOLUTELY NO ELECTRONIC EQUIPMENT IS ALLOWED ON YOUR PERSON DURING EXAMS.

**Late work:** Due dates for all assignments will be announced in class. Unless you have a valid excuse, late work will receive a 20% deduction per day it is late. Work that is more than 4 days late will not be accepted and will receive a grade of zero. Unless you have an excused absence, there are no make-ups for in-class assignments.

**Exams:** Exam dates are fixed and will not change. Please plan accordingly. If you do miss an exam, you will receive a zero, unless you have an unexpected emergency, in which case you must contact me as soon as possible to make the necessary arrangements. If you require special accommodations for taking an exam at the testing center, you must contact the Testing Center at (713) 525-3160 to schedule an appointment. Please notify me so I can have an exam there for you.

**Academic Dishonesty:** The professor-student relationship is based on trust: you trust that I will do my best to teach you the subject-matter and that I will be available when you need me, I trust that you will put your best effort into your work. This also means that you will be honest about it. ABSOLUTELY NO FORM OF COPYING, PLAGIARISM OR ANY OTHER TYPE OF ACADEMIC DISHONESTY WILL BE TOLERATED. Cheating includes using unauthorized sources during exams and copying from your classmates, as well as allowing someone else to copy from you. Plagiarism includes copying directly from sources on the web or presenting the work/words of others as your own. During your writing, please note that **no quoting is used in scientific writing. Put all material in your own words.** Students who turn in plagiarized work or who are caught cheating will receive a zero for that assignment and may be withdrawn from the course. If you are unsure if something constitutes cheating or plagiarism, please **ASK.** Claiming ignorance is not an excuse.

According to University Policy, students who are caught cheating will be given a Report of Academic Dishonesty. Please note that if this happens twice, you will be dismissed.
from the university and a note will be attached to your transcript (please refer to the Academic Dishonesty policy in the Undergraduate Catalog). Imagine what this would do for your future! It is simply not worth it. Make the right choice.

Suggestions for doing well in this class

- **Come to class!** Use the learning opportunities that lecture provides - you don’t only learn about course content – you learn to get disciplined about a schedule, how to take notes, how to sort through the material covered, and how to apply what you read about to novel situations. You also learn to work with others. Bear in mind that we will be working a lot in groups – if you miss, your team suffers for it too.

- **Participate in class discussions!** By communicating your ideas you organize your thoughts. I want to hear what you have to say! Participation in group activities also helps your learning.

- **Take good notes!** Be selective about what you write down. You don’t have to copy slides word for word – I post slides after class. **Listen**, and write only the main points. Transcribe or rewrite your notes as you study. Add information to them as you review them each week. Get notes from a classmate if you miss class.

- **Read ahead!** It is really important that you read your textbook and you will get more out of lecture if you read ahead of time.

- **Study!** The rule of thumb is that you spend 2 hours of study time for each hour spent in class but you may need more or less time – only you can determine that. Some topics will require more time, others less. You should get into the habit of studying weekly, not just right before exams. Do not procrastinate. We cover a lot of material and it will get overwhelming quickly if you do not keep up. Studying for exams will be a lot easier if you have reviewed on a weekly basis. Your grade will show it!

- **Draw and write as you study!** Test yourself. Writing and drawing things out is a great way to make sure you really understand the material.

- **Study in groups!** Discussing the material with others always helps reinforce concepts. It forces you to organize thoughts and think about important points. If you can explain things to others, it means you have learned them. Talking with peers about the material also helps you clarify misconceptions.

- **Get help if you need it!** Ask questions. I want to know if I need to clarify concepts. Stop me in lecture and ask if things don’t make sense. If you do not feel comfortable speaking out in class, see me after lecture or come to my office during office hours – I have an open door policy! Additionally, UST has a Tutorial Services Center that offers a vast array of activities, workshops and information that can help you improve your study, time-management, and test-taking skills. They also offer free peer tutoring in all subjects! Take advantage of these opportunities – they are free and offered to help you succeed.