

BIMM 120: Bacteriology – WINTER 2012 (SECTION ID 736198)

108 Peterson Hall – Tues & Thur 6:30 – 7:50 PM – INSTRUCTOR: DR. JAMES W. GOLDEN

BIMM 120. Bacteriology (4)

A discussion of the structure, growth, molecular genetics, and physiology of procaryotic (prokaryotic) microorganisms, with emphasis on the diverse activities of bacteria and on the interaction of various bacterial species with their environment. Three hours of lecture and one hour recitation. **Prerequisites:** Chem. 140A; Chem. 140B; BIBC 100 or BIBC 102 (may be taken concurrently).

Expanded Prerequisites: To do well in BIMM 120 you should have a strong background in general biology and organic chemistry. Two quarters/semesters of organic chemistry are important prerequisites. Students should know basic cell biology, molecular biology, and genetics. It is assumed that students know the basic structures and properties of major types of molecules found in cells. Students may need to study and review information in Chapters 3, parts of 5, and 7, which students should already know from their prerequisites. Students are individually responsible for any remedial learning required to understand the material presented in this course.

Class Schedule (approximate, topics will not exactly match class periods)

Readings from UCSD Custom Textbook (or alternatively, Brock Biology of Microorganisms, 13th ed.): including text, figures & figure legends, tables, and sidebars.

DATE	LECTURE NUMBER & TOPIC	READINGS
Tu Jan 10	1. Overview of microbiology & bacteria	Chapter 1
Th Jan 12	2. Microscopy and basic cell structure	Chapter 2
Tu Jan 17	3. Cell structure	Chapter 3
Th Jan 19	4. Cell structure	Chapter 3
Tu Jan 24	5. Nutrition & Metabolism	Chapter 4
Th Jan 26	6. Growth	Chapter 5
Tu Jan 31	7. Molecular biology of bacteria & archaea	Chapter 6; 7.1-7.4
Th Feb 2	8. Regulation of gene expression	Chapter 8 Homework 1 due
Tu Feb 7	9. Bacterial viruses (phage)	Chapter 9.1-9.10
Th Feb 9	10. MIDTERM EXAM	Lectures # 1-9 (50 questions)
Tu Feb 14	11. Bacterial genetics	Chapter 10
Th Feb 16	12. Bacterial genetic engineering	Chapter 11
Tu Feb 21	13. Bacterial genomics	Chapter 12
Th Feb 23	14. Metabolic diversity	Chapter 13
Tu Feb 28	15. Metabolic diversity	Chapter 14
Th Mar 1	16. Industrial microbiology & Biotechnology	Chapter 15 Homework 2 due
Tu Mar 6	17. Bacterial Evolution, systematics, ecology	Chapter 16 & 17(22)
Th Mar 8	18. Microbial growth control	Chapter 18(26)
Tu Mar 13	19. Microbial interactions with humans	Chapter 19(27)
Th Mar 15	20. Microbial interactions with humans & Review	Chapter 19(27)
Tu Mar 20	FINAL EXAM 7:00 PM-9:59 PM, 108? PETERSON?	LECTURES # 11-20 (50 QUESTIONS) + COMPREHENSIVE (25 QUESTIONS)

Lectures: The lectures contain additional information that is not in lecture slides, and it is important to attend the lectures or listen to the podcasts. Because this is a very large lecture class, minimizing distractions is important. Please have respect for your classmates and the Instructor by turning off or silencing cell phones and by not talking and avoiding other distracting activities in class.

Class web site: Ted at <https://ted.ucsd.edu/>

The class web site contains links to the syllabus, lecture presentations, practice exam questions, assigned research papers, and may be used for submitting homework assignments. The Discussions tool is monitored by TAs but not by the Instructor unless a TA reports a problem that needs to be addressed.

Required textbook: UCSD Bookstore: BIMM 120 Custom: Brock Biology Of Microorganisms. OR "Brock Biology of Microorganisms" (13th ed.) by Madigan, Martinko, Stahl, and Clark. (Either textbook is okay.) Several copies of the textbook will be available on reserve at the Biomedical Library.

Textbook web site: <http://www.microbiologyplace.com/> (access code will be provided in discussion sections) You are strongly encouraged to use the textbook web site as a learning resource. Please explore it.

Audio & Video of lectures: <http://podcast.ucsd.edu/>

Microbiology related websites:

ASM, American Society for Microbiology: <http://www.asm.org/>

Microbe wiki: <http://microbewiki.kenyon.edu/>

Instructor

Dr. James W. Golden

Email: jwgolden@ucsd.edu (For official correspondence. Course content questions should be asked in TA discussion sections or TA office hours, or at the Instructor's office hours.)

Office hours: after class; or Fridays, 10:00-11:00 AM in 4832 (or 4882 AP&M conference room); or by appointment (just call or send email with a few suggested times to meet)

Office: 4832 AP&M (Applied Physics & Mathematics)

Phone: (858) 246-0643

Teaching Assistants (TAs)

TA Name	Email	Office Hour	Location
Derek Jordan Bangs	djbangs@ucsd.edu	T 11:30 - 12:30 PM	Leichtag Lobby
Gerald Andrew Cheadle	gcheadle@ucsd.edu	W 5:00 - 6:00 PM	AP&M 4882
Ashley Ann Cirillo	acirillo@ucsd.edu	Th 5:00 - 6:00 PM	Sun God Lounge
Anthony Daulo	adaulo@ucsd.edu	T 5:00 - 6:00 PM	AP&M 4856/4882
Semi Han	seh002@ucsd.edu	W 9:00 - 10:00 AM	BSB 2016
Wilson Chi Kwan	wkwan@ucsd.edu	Th 1:00 - 2:00 PM	SCR 324
Shawn Dinesh Shah	sdshah@ucsd.edu	M 5:00 - 6:00 PM	Sun God Lounge
Kim Ngoc Vu	k4vu@ucsd.edu	F 2:00 - 3:00 PM	MTF 416
Ina Wu	inwu@ucsd.edu	Th 9:30 - 10:30 AM	Sun God Lounge

Students should sign up for a Discussion Section at <http://sections.ucsd.edu/overview.shtml>

Discussion Section times and locations: (start the second week of classes)

#	Day & Time	Location	TA Name
A01	M 2:00 - 2:50 PM	WLH 2209	Derek Jordan Bangs
A02	M 3:00 - 3:50 PM	WLH 2209	Kim Ngoc Vu
A03	M 4:00 - 4:50 PM	WLH 2209	Shawn Dinesh Shah
A04	M 5:00 - 5:50 PM	WLH 2209	Gerald (Jack) Andrew Cheadle
A05	M 6:00 - 6:50 PM	WLH 2209	Gerald (Jack) Andrew Cheadle

A06	M 7:00 - 7:50 PM	WLH 2209	Anthony Dauilo
A07	M 8:00 - 8:50 PM	WLH 2209	Anthony Dauilo
A08	F 11:00 - 11:50 AM	U413 2	Wilson Chi Kwan
A09	F 12:00 - 12:50 PM	U413 2	Wilson Chi Kwan
A10	F 1:00 - 1:50 PM	U413 2	Ashley Ann Cirillo
A11	F 2:00 - 2:50 PM	U413 2	Ina Wu
A12	F 3:00 - 3:50 PM	U413 2	Semi Han
A13	F 4:00 - 4:50 PM	U413 2	Semi Han

All questions about course material, exam preparation, homework assignments, etc. should be asked at TA discussion sections and office hours. Attending a discussion section each week is *highly recommended*, but is not required. TA's will answer questions, review class material, review for exams, and discuss and answer questions about the homework assignments. Students must sign up for a discussion section online and should normally attend that section, but may attend any discussion section or TA office hour if space is available.

Exams and final course grade:

There will be one midterm exam (50 questions, 100 points), one final exam (75 questions, 150 points), and two written homework assignments (10 points each x 2 = 20 points). Most exam questions will require an *integrated understanding* of the material, not just memorization of facts. Final grades will be based on the percentage of total points for the midterm, the final, and the homework assignments. There are no extra-credit assignments.

There are NO scheduled make-up exams. Make-up exams are decided case-by-case and require a university authorized written excuse from a doctor or other authority. Make-up exams may be an oral or essay exam administered by the Instructor or a TA. If you miss an exam, you **must contact the Instructor within 24 hours** to determine if you are eligible for scheduling a make-up exam.

The minimum grade earned for the course will be based on a straight scale of the percentage of total possible points (points earned / 270 x 100 rounded to nearest 0.01%) with cutoffs as shown below. For example, the computer will assign a B+ grade to a percentage of 89.99, and an A- grade for 90.00. Grades cannot be changed for individual students for any reason. If you have what you consider to be extraordinary circumstances that warrant a change in your grade, then you should contact an academic counselor, not the instructor of this course.

A+	A	A-	B+	B	B-	C+	C	C-	D	F
97	93	90	87	83	80	77	73	70	60	<60

The class average for this course is typically a B-/C+, and the final grades will be assigned with an appropriate adjustment or "curve" if necessary. The grade scale adjustment is not made until after the final exam scores and all other scores are available and cannot be predicted before then.

I must be completely fair to ALL students in the class and cannot under any circumstance give special consideration to an individual student. You will receive the grade that you have earned with no exceptions. There are always students who just miss a higher grade at each cutoff score. In this very competitive course, you can be sure that no student above the cutoff wants me to lower the cutoff to allow more students to get a higher grade--students have told me that very clearly.

Exams:

Enter the classroom and **FILL IN ALL SEATS FROM THE FRONT OF THE ROOM**. You must bring your student ID and a #2 pencil and eraser. Exam forms will be provided. No calculators, phones, or other electronic devices are required or allowed, and no hats or hoods. **ALL** personal items must be **CLOSED** and placed on the floor **UNDER** your seat or at the front of the room. Make sure your

phone is turned OFF. Once you leave the room, you may NOT return to the room until the exam is over.

Each exam will consist of multiple-choice questions, and will include questions taken from the lecture AND the textbook or other assigned readings. Always choose the *BEST* answer even though it might not be perfect. There should be *one best* answer for each question. For the midterm exam only, the exam key will be posted to Ted, usually within **24 hours** after the exam.

During the exam: If you are sure that a question is written ambiguously or feel that more than one answer is correct, raise your hand and ask for clarification. Most ambiguities and problem questions should be identified this way, so that clarifications can be made to the entire class and so that the grading key can be modified before the exams are graded. The TAs cannot define words or help you understand a question.

After the midterm exam only: If you are sure that the exam key is clearly wrong, then, within **24 hours** after the key is posted, prepare a written explanation, with documentation (reference the textbook page and section), and deliver the query to your TA via email. *Just one written inquiry, and no verbal inquiries, will be considered for each exam, from each student.* All inquiries will be carefully considered and forwarded to the course Instructor if they might be valid, but discussion of inquiries about exam questions is done only at office hours and not by email.

If we find that a question has more than one answer or should be discarded after the exams have been graded, then all of the exams will be re-graded using the corrected answer key. In over 20 years I have never had errors made by the scantron service, however, if you are sure that something must be wrong with your score, then discuss your concern with the Instructor.

To prepare for the exams:

1. Attend lectures or listen to the podcasts! Some questions will come directly from the lectures. Most exam questions will be on topics presented in lecture; however, related textbook readings are required to fully understand the material. A few questions will come from the assigned textbook readings or homework assignments, even if the material was not covered in lecture.
2. Read the related material in the text. These readings will reinforce the lectures and provide information that is necessary to understand and integrate the information provided in lecture. If you require remedial study of information taught in introductory biology or biochemistry courses, then review the appropriate chapters in the textbook or from other sources.
3. As necessary, review textbook sections that provide review/remedial material that you are expected to have learned in prerequisite courses.
4. Attend discussion section regularly, as you will be able to ask questions about the lectures and readings.
5. Study the textbook Mini Reviews, Review of Key Terms, Review Questions, and Applications Questions.
6. Use the textbook web site to better understand the material.
7. Do not cheat! *Disciplinary steps will be taken when cheating is discovered. These steps may include failing the exam and being reported to the appropriate university authorities.*

In past years, the students who do best regularly attended lectures and discussion sections, read the textbook, and review class notes each week.

Homework written assignments (Posted on Ted, 10 points each):

Scientific research articles, also called "papers", are the basis for scientific progress and information exchange, and for the information in textbooks and science classes. Scientists use scientific methods and logic to obtain data that are presented in these papers. These published ideas, methods, data, and conclusions can be critically analyzed by other scientists who can then repeat and extend the original results. For students, reading scientific articles is important to understand the scientific method and the source of the information you are learning.

For the homework assignments, you will be given a few questions on Ted related to a specific research article (also posted on Ted) and asked to write a short answer for each question. The answer(s) to the question(s) should be single-spaced, 1 inch margins, 11 pt Arial or equivalent, and occupy no more than 1 side of 1 page, total. You should use a spelling and grammar checker. The TAs can help you understand the papers at discussion sections and office hours, but they CANNOT pre-grade answers or help you with your specific answers. A **PRINTOUT** of your homework answers must be turned in at your TA discussion section or office hour. The printed answer page will be graded by your TA and must have your name, PID, and signature, which is your assurance that your answers are your own work.

Note that you should read the whole paper because it is likely that at least one question on the Final Exam will be related to each of the homework papers.

Although the research articles may be discussed in TA discussion sections and with your classmates, you must write your own homework answers independently. It is expected that you may need to look up additional information in textbooks or on the web to understand the research articles, but all answers must be in your own words. Do not copy or plagiarize the article or any other source in your answers. By submitting a homework assignment, you are certifying that it is exclusively your own work. Homework answers may be checked by Turnitin.com.

Grading will be done with a rubric/key developed by the Instructor and TAs, and by comparison to the best student homework answers to achieve consistent and fair scores for all students. All aspects of the answers, including logical presentation and spelling/grammar will be considered for your score. Your answers may require a brief explanation of how or why the answer works or addresses the question. Points may be deducted for including information that is not related to the correct answer because this indicates a lack of understanding. Homework assignments will not be returned or regraded. The TAs carefully assign scores for the homework answers, but are not asked to mark corrections or make annotations.

General guidelines for reading the papers:

Familiarize yourself with the related topic:

Research papers are written for people who already know something about the subject matter. Read the related material in the textbook or other sources to familiarize yourself with the subject matter.

Read the paper before attending a TA discussion section to hear your TA's summary of the paper and to ask questions about the paper. You are not expected to understand everything in these primary research articles, but you should pay attention to the following as you read the papers (again, the specific homework assignment will be posted on Ted):

1. Identify the questions being asked in the paper.

Frequently the introduction (or the first few paragraphs of Science and Nature articles) will present background information and raise the questions that will be addressed in the paper.

2. Identify the main conclusions in the paper.

The main conclusions will be summarized in the abstract, and further presented in the discussion/conclusion section. Determine why the conclusions are important.

3. Examine the experiments that were performed to answer the questions.

The experiments and data will be briefly summarized in the abstract and will be presented in the methods and results sections of the paper.

4. For each experiment:

Determine how the experiment was done. (But you are not expected to understand all of the details in the methods.) Examine the data. Consider the author's conclusion about the experiment and decide if the conclusions are valid. Decide if proper controls samples or conditions were included. Consider any caveats or concerns raised by the authors about their data. Think about alternative conclusions or explanations for the data—maybe the authors are wrong!

Statement on Office for Students with Disabilities (OSD):

To receive accommodation, students must present their "Authorization for Accommodation" (AFA) form provided by the Office for Students with Disabilities (OSD) to the instructor.

Statement on Academic Integrity:

Integrity of scholarship is essential for an academic community. The University expects that both faculty and students will honor this principle and in so doing protect the validity of University intellectual work. For students, this means that all academic work will be done by the individual to whom it is assigned, without unauthorized aid of any kind. The consequences of being caught cheating can be severe.

Information can be found here:

<http://www.ucsd.edu/current-students/academics/academic-integrity/index.html>

Students are expected to do their own work, as outlined in the UCSD Policy on Integrity of Scholarship:

<http://www.ucsd.edu/current-students/academics/academic-integrity/official-policy.html>

Academic misconduct will NOT be tolerated. Any student who engages in suspicious conduct will be confronted and subjected to the disciplinary process. Cheaters will receive a failing grade on the exam or assignment, and/or in the course. They may also be suspended from UCSD pursuant to University guidelines. (Translation: just don't do it!)

Academic misconduct includes but is not limited to:

1. **Cheating**, such as using "crib notes" or copying answers from another student during the exam.
2. **Plagiarism**, such as using the writings or ideas of another person, either in whole or in part, without proper attribution to the author or the source. Copying anything from any source is plagiarism if the source is not clearly cited. Plagiarism is stealing someone else's ideas and presenting them as your own.
3. **Collusion**, such as engaging in unauthorized collaboration on exams or assignments, completing for another student any part or the whole of an exam or assignment, or procuring, providing or accepting materials that contain questions or answers to an exam or assignment to be given at a subsequent time.