BIMM 120: Bacteriology – WINTER 2011 (SECTION ID 704603)

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 Textbook (Brock Biology of Microorganisms, see below): includes text, figures & figure legends, tables, and sidebars

DATE	LECTURE NUMBER & TOPIC	READINGS
Tu Jan 4	1. Overview of microbiology & bacteria	Chapter 1
Th Jan 6	2. Microscopy and basic cell structure	Chapter 2
Tu Jan 11	3. Cell structure	Chapter 4
Th Jan 13	4. Cell structure	Chapter 4
Tu Jan 18	5. Nutrition & Metabolism	Chapter 5.1-5.3; 5.10; 5.14
Th Jan 20	6. Growth	Chapter 6
Tu Jan 25	7. Regulation of gene expression	Chapter 7.9-7.12; 9.1-9.6; 9.8-9.9
Th Jan 27	8. Bacterial development	Chapter 9.12; 15.17; 16.6-16.7 **Homework 1 due**
Tu Feb 1	9. Bacterial viruses (Phage)	Chapter 10.1-10.10
Th Feb 3	**10. MIDTERM EXAM**	**Lectures # 1-9 (50 questions)**
Tu Feb 8	11. Bacterial genetics	Chapter 11
Th Feb 10	12. Bacterial genetic engineering	Chapter 12.1-12.4; 12.8-12.10
Tu Feb 15	13. Bacterial evolution & systematics	Chapter 14.1-14.9
Th Feb 17	14. Metabolic diversity	Chapter 20.1-20.9; 20.14-20.15
Tu Feb 22	15. Metabolic diversity	Chapter 21.1-21.2; 21.6; 21.17; 21.19
Th Feb 24	16. Bacterial ecology	Chapters 22.1-22.5; 23.1-23.5 **Homework 2 due**
Tu Mar 1	17. Industrial microbiology & Biotechnology	Chapters 25.1-25.6; 25.10-25.11; 26.1-26.2; 26.5
Th Mar 3	18. Microbial growth control	Chapter 27.1-27.9; 27.12
Tu Mar 8	19. Microbial interactions with humans	Chapter 28.1-28.12
Th Mar 10	20. Microbial interactions with humans & Review	Chapter 28.1-28.12
Tu Mar 15	**FINAL EXAM 7:00 PM-9:00 PM, TBA**	**LECTURES # 11-20 (50 QUESTIONS) + COMPREHENSIVE (25 QUESTIONS)**

Lectures: 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: http://webct.ucsd.edu/
The class web site contains links to the syllabus, lecture presentations, practice exam questions, assigned research papers, and is used for submitting the 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: "Brock Biology of Microorganisms" (12th ed., 2009) by Madigan, Martinko, Dunlap, and Clark; either the hard cover or loose-leaf version.
Several copies of the textbook should be available on reserve at the Biomedical Library.
Textbook web site: http://www.microbiologyplace.com/
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 office hours, or at the Instructor's office hour.)
Office hours: Friday, 9:00-10:00 AM in 4882 AP&M conference room; or after class or by appointment
Office: 4832 AP&M (Applied Physics & Mathematics)
Phone: (858) 246-0643

Teaching Assistants (TAs)

TA Name	Email	Office Hour	Location
Chris Fascenda	cfascend@ucsd.edu	M 7:00-7:50 PM	Perks Café in Bookstore
Edward King	eking@ucsd.edu	Tu 5:00-5:50 PM	CLICS
Hannah Latif*	hlatif@ucsd.edu	W 7:00-7:50 PM	NSB 3204
Nicolle Ma*	ncma@ucsd.edu	Th 3:00-3:50 PM	Tree House Comp. Lounge
Yuumi Miyazawa	ymiyazaw@ucsd.edu	W 3:00-3:50 PM	Café Espresso Roma, PC
Kevin Penn*	kpenn@ucsd.edu	Th 4:00-4:50 PM	Café Espresso Roma, PC
Anh Pham*	A4pham@ucsd.edu	Tu 4:00-4:50 PM	Commuter Lounge, PC
Yekaterina (Kat) Tarasova	ytarasov@ucsd.edu	M 10:00-10:50 AM	Geisel S & E Library
Bridget Whitney	bwhitney@ucsd.edu	M 1:00-1:50 PM	Perks Café in Bookstore

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)

#	Time	Location	TA Name
A01	M 9:00 - 9:50 AM	HSS 2154	Anh Pham*
A02	M 10:00 - 10:50 AM	HSS 2154	Kevin Penn*
A03	M 11:00 - 11:50 AM	HSS 2154	Kevin Penn*
A04	M 12:00 - 12:50 PM	HSS 2154	Bridget Whitney
A05	M 1:00 - 1:50 PM	HSS 2154	Anh Pham*
A06	W 2:00 - 2:50 PM	HSS 2154	Chris Fascenda
A07	W 3:00 - 3:50 PM	HSS 2154	Nicolle Ma*

A08	W 4:00 - 4:50 PM	HSS 2154	Nicolle Ma*
A09	W 5:00 - 5:50 PM	HSS 2154	Hannah Latif*
A10	W 6:00 - 6:50 PM	HSS 2154	Hannah Latif*
A11	Th 4:00 - 4:50 PM	WLH 2206	--Canceled--
A12	Th 5:00 - 5:50 PM	WLH 2206	Edward King
A13	F 9:00 - 9:50 AM	CENTR 220	Yuumi Miyazawa
A14	F 12:00 - 12:50 PM	HSS 2154	Yekaterina (Kat) Tarasova

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 will sign up for a discussion section online, 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 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 0.1%) with cutoffs as shown below. For example, the computer will assign a B+ grade to a percentage of 89.94, and an A- grade for 89.95.

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 "curve". 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.

Exams:

Enter the classroom and FILL IN <u>ALL</u> SEATS FROM THE FRONT OF THE ROOM. You must bring your <u>student ID</u> and a <u>#2 pencil</u> and <u>eraser</u>. 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 WebCT, 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 Instructor 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, but discussion of inquiries and 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! 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 WebCT, 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 WebCT related to a specific research article (also posted on WebCT) 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.

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 WebCT):

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.