BIMM 120: Microbiology, Winter 2022

Tu & Th 12:30p – 1:50p; JEANN AUD; Instructor: James Golden, PhD

BIMM 120. Microbiology (4)
A discussion of the structure, growth, physiology, molecular genetics, genomics, and ecology of prokaryotic microorganisms, with emphasis on the genetic and metabolic diversity of bacteria and archaea and their interactions with hosts and the environment. ***Prerequisites:*** BILD 3 and BIBC 100 or BIBC 102 or CHEM 114A or CHEM 114B and BIMM 100.

General Prerequisites: To do well in BIMM 120, students should have a strong background in general biology and organic chemistry. Students should know sophomore-level cell biology, molecular biology, genetics, and evolution. Some students may find it useful to review basic information on organic chemistry, biochemistry, and cell biology in the textbook Appendix 1: Reference and Review.

Class Schedule (approximate)

Put **midterm and final exams** on your calendar. Drop conflicting courses.

Week or Date	Lecture Number & Topic	Readings*
1,1	Class Introduction, Microbial Life	Syllabus, Chapter 1
2	Origins and Evolution	Chapter 17
2	Food and Industrial Microbiology	Chapter 16
3	Human Microbiota and Innate Immunity	Chapter 23
3	Microscopy	Chapter 2
4	Microscopy	Chapter 2
4	Cell Structure & Function of bacteria	Chapter 3
5	Growth & Development of bacteria	Chapter 4
Fri, Feb 4	**Homework 1 due 11:59pm**	Research paper
5	Environmental influences and control of growth	Chapter 5
6–**Tu, Feb 8**	**MIDTERM EXAM**	**Weeks 1-5 (40 questions)**
6	Bacterial viruses (bacteriophage)	Chapter 6
7	Genomes of bacteria	Chapter 7
7	Gene expression in bacteria	Chapter 8
8,8	Bacterial Genetics	Chapter 9
9,9	Regulation in bacteria	Chapter 10
Fri, Mar 4	**Homework 2 due 11:59pm**	Research paper
10	Energetics and Catabolism in bacteria	Chapter 13
10	Organo-, Litho-, and Photo-trophy, and Biosynthesis	Chapter 14
Tu, Mar 15	**FINAL EXAM** 11:30a-2:29p, The Jeannie Auditorium.	**Weeks 6-10 (40 questions) and comprehensive (20 questions) = 60 total questions**

***Readings**: textbook material **related to lectures** is specified in a separate document. Readings including text, figures & figure legends, tables, and assigned Special Topics. **A separate document specifies which textbook chapter sections to read.**

Instructor: Dr. James Golden
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Email: jwgolden@ucsd.edu (Please put BIMM120 in the subject). Please email the instructor for any course administration issues. Course content questions are best answered in person (or Zoom) at IA discussion sections, IA office hours, and the instructor's office hours.
Instructor office hours: after each class Tu & Thr until all students leave; or by appointment in-person or by zoom (just call or send email with suggested times to meet).

Lectures: Lecture PowerPoint presentation files will be on **Canvas** and the lectures will be **podcasted** at http://podcast.ucsd.edu/ (however technical problems sometimes cause podcasts to fail).

Class web site: Canvas at https://canvas.ucsd.edu/
The "**Modules**" section contains links to the syllabus, lecture presentations, last year's old exams, and the homework assignments including the assigned research papers. The Modules section will also contain links to study materials supplied by the publisher; note that these materials are for the entire textbook, which contains much more information than will be covered in this course. *Students are only responsible for assigned readings and the material covered in the class lecture.*

Textbook: **Microbiology: An Evolving Science, 5e** or earlier editions, Slonczewski, Foster, Zinser (ebook, paperback, or loose-leaf textbook). The textbook contains information and examples for which there is not enough time to cover in lecture. To help students get the most out of class lectures, **weekly quizzes will be based on the textbook readings for upcoming lectures.** Older editions of the textbook are okay, or even a different microbiology textbook or free online information, but students are responsible for correlating the other sources of information with the lecture material, which will be based on the 5e edition of the textbook. The ebook has various study tools, such as animations and quiz questions, that some students find useful.

Information from the UC San Diego Bookstore:
Your digital course materials are provided by the UC San Diego Bookstore through Canvas and are free for the first two weeks of classes. After two weeks, your student account will be charged a special reduced price unless you opt out. If you decide to opt out you must complete the process by ***January 15th, 2022,*** *and you will be responsible for sourcing the materials elsewhere.*
For any questions about billing please contact textbooks@ucsd.edu.
For any questions about using your eBook please reference RedShelf Solve.
To opt-out:

- *Click the RedShelf link in Canvas*
- *Click View Course Materials*
- *Scroll down to the gray opt-out button and follow the prompts to opt out.*

Again, you have until ***January 15th, 2022,*** *to complete this process and you will be responsible for getting access to the materials elsewhere.*

- Look out for an email from donotreply@redshelf.com and check your spam folders if you don't receive the email.

- *Here is the RedShelf Solve link and the Inclusive Access FAQ page for student support and questions.*

Microbiology related websites:
ASM, American Society for Microbiology: http://www.asm.org/
Microbe wiki: http://microbewiki.kenyon.edu/

IA discussion sections and office hours are provided to help you learn course material. Use IA sections and office hours for review and questions about course material, homework assignments, exam preparation and review, post-exam questions, etc. Attending your discussion section each week is *highly recommended*. Points will be awarded for either section attendance or submission of 2 questions as described below. IAs will review class material, answer questions, review for exams, and discuss and answer questions about the homework assignments.

Instructional Assistants (IAs).

IA Name	Email	Office Hour	Location
Sumedha Ravishankar	sravisha@ucsd.edu	M 11:00a – 11:50a	Tata Hall, 4th floor
Yashaswat Malhotra	ysmalhot@ucsd.edu	F 5:00p – 5:50p	Outside Old Student Center
Jackie Zhao	jiz065@ucsd.edu	F 1:20p – 2:10p	In Front of Leichtag
Isabella Nehorayan	inehoray@ucsd.edu	M 3:00p – 3:50p	Zoom
Thomas Winham	twinham@ucsd.edu	Th 5:00p – 5:50p	Zoom

Discussion Section times:
Sections and office hours **start the second week of classes** and will be synchronous. If required, zoom links will be on Canvas. Sections and office hours will not be recorded.

Section	Day & Time	Location	IA Name
A01	M 10:00a - 10:50a	WLH 2209	Sumedha Ravishankar
A02	M 4:00p - 4:50p	PCYNH 240	Thomas Winham
A03	M 12:00p - 12:50p	SEQUO 147	Sumedha Ravishankar
A04	W 8:00a - 8:50a	SOLIS 110	Isabella Nehorayan
A05	F 8:00a - 8:50a	SOLIS 109	Jackie Zhao
A06	F 4:00p - 4:50p	PCYNH 240	Yashaswat Malhotra
A07	F 6:00p - 6:50p	HSS 2321	Yashaswat Malhotra

Final course grades will be based on the following:
7 Quizzes (out of 9 possible), one per week **due 11:59p Monday night**. Students can drop 2 quizzes. Quizzes are taken on Canvas and each quiz will have 5 questions worth 2 points each = 10 points per quiz, 70 points total for best 7 quizzes out of 9 possible.
1 Midterm exam with 40 questions worth 2 points each, 80 points total
1 Final exam with 60 questions worth 2 points each, 120 points total
2 Written Homework assignments worth 15 points each, 30 points total)
6 discussion section attendances (or submitted questions per missed section class, see below) out of 9 possible (5 points for attending the entire class, 30 points total) (3 discussion sections can be missed without losing points).
Total points possible = 70 + 80 + 120 + 30 + 30 = **330**.

Standard UCSD Grading Scheme

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Percentage	97.0	94.0	90.0	87.0	84.0	80.0	77.0	74.0	70.0	60.0	<60.0

Calculated percentages are rounded up to the next 0.1 percentage. For this class, some lower grade cutoffs have been adjusted slightly lower to be a little more lenient. The class average for this course is typically a B-. There will be at least 20% A grades for this class. If a grade scale adjustment (curve) is needed, it will be made after all scores including the final exam scores are available.

Final grades will be based on the percentage of total points. There are **no** extra-credit assignments and **no** alternate quizzes or exams. Make sure your classes have **no** exam conflicts.

There are **no** scheduled make-up exams. Make-up exams are decided case-by-case and require a written excuse sent from the student's UCSD email address documenting that the exam was missed because of unavoidable circumstances outside of the student's control. Make-up exams may have multiple choice, short answer, or essay questions. If you miss an exam, **you must contact the Instructor within 24 hours of the missed exam** to determine if you are eligible for scheduling a make-up exam. Missing the final exam will result in an incomplete grade.

Grades must be based on only academic criteria and cannot be changed for individual students for any other reason. To be fair to all students, the instructor cannot change a grade for an individual student for any reason other than academic criteria described in the syllabus.

Do not cheat! Disciplinary steps will be taken when cheating is discovered. University policy dictates that Instructors **must** file a report of suspected academic integrity violations to the University Academic Integrity Office. https://academicintegrity.ucsd.edu/take-action/report-cheating/index.html

How to do well in the course:
1. Read the textbook sections covered in lecture **mindfully**. These readings will reinforce the lectures and help you understand the material.

2. Attend or watch lectures **mindfully**. Exam questions will be on topics and information presented in lecture; however, related textbook readings are necessary to fully understand the material. A couple exam questions may be related to the homework assignments.
3. Attend your discussion section for review and to ask questions about the lectures and readings.
4. The textbook readings, quizzes, lectures, discussion sections, and exams are designed to enhance student learning by providing repetition of the class material in different formats. By mindfully engaging in each of these, students should feel confident in their knowledge of microbiology for their future endeavors in science, medicine, healthcare, and their own lives.

The students who do best in the course regularly attend lectures and discussion sections, read the textbook, and review their class notes each week.

Quizzes and Exams:
Quizzes will cover material I expect to cover in the next lectures the week of the quiz, and will include questions based on the textbook readings for those upcoming lectures (which may be behind the syllabus schedule). **The quiz name will specify the covered chapters.** Quizzes will be available for **24 hours on Monday's until 11:59pm** (*except week 1, which does not have a quiz*). It is recommended that students complete the assigned reading before Monday to be ready to take the quiz. Because the quizzes are open book, students can review material to choose the best answers.

Quizzes will be taken remotely online on Canvas, and they are **open book**. Open book means that you can obtain primary information from the textbook, lecture presentations, your lecture notes, and the internet while taking the quizzes. However, the quizzes **must be your own work** and there **must be NO collusion with other people by any means**. You cannot ask others for the answer by any method. Quizzes and exams only sample student's knowledge. As an incentive to learn all the material and to deter cheating, scrambled questions will be presented one at time and are locked after submitting the answer.

Midterm and Final Exams will include questions related to information presented in the lecture and slides, and the related sections of the textbook. One or two questions may be related to the homework assignments. Quizzes and exams will consist of **multiple-choice questions with 1 best answer**. Many exam questions will require an *integrated understanding* of the material, not just memorization of facts.

The **Midterm and Final Exams will be taken in-person**. The **Midterm** is taken in the **lecture room** during the normal **lecture time period**. The **Final Exam** will be taken at the time and location announced in the schedule of classes, which will be posted on Canvas.

In-Person Exam Procedures:
You must bring your **student ID** and a **#2 pencil** and **eraser**. **Scantron exam forms will be provided**. **No** calculators, phones, smart watches, or other electronic devices are required or allowed. ALL personal items must be **CLOSED** and placed on the floor UNDER your seat. Make sure your phone is turned **OFF** and put away. Once you leave the room, you may NOT reenter the room until the exam is over. Students must show their **Student photo ID** when they **turn in** their completed **Scantron exam form** and **question pages**, which must have their **correct UCSD name and PID – DOUBLE CHECK**.

For the midterm and final exams, students may also mark their answers on the exam question pages. For the midterm exam, exam question pages can be viewed at IA office hours. If students mark their answers on the question pages, then they can go over missed questions with their IA.

Advice for taking quizzes and exams. Read the questions and answers carefully. Always choose the ***BEST* answer** even though it might not be perfect. Unless a question specifically asks about exceptional cases, answer questions based on the **general rule** and not exceptions to the rule. In biology, there are exceptions to almost everything. Answer questions based on information in this class's PowerPoint lectures and textbook. Be careful with variations in nomenclature and information on the internet from unofficial and unverified sites. Be careful with confounding information from another class or your own research experience that might complicate which answer is best; always choose the answer that is best in the context of this course and textbook.

Discussion section attendance.
Credit is earned by attending the **entire discussion section class**. If you cannot attend 6 of your discussion section classes, then to get attendance credit you can **submit 2 detailed questions related to the last 2 lectures before the section class to your IA by the end of the day after the missed discussion section class**. Each question must be **specific**, logical, and meaningful. You will NOT get credit for a general question such as "how do membrane transporters work?). **Each question** must have 1 sentence stating the topic and the lecture slide related to the question, 1 or 2 sentences stating what you understand about the topic, and then 1 or 2 sentences stating what you don't understand and what your question is. The purpose is to have you think about the class material that you don't fully understand. The submitted questions will be scored but not directly answered unless the students attends the IA's office hour.

Homework written assignments (Posted on Canvas):
The homework assignment **questions**, **answer form**, and the related **research paper** will be posted on Canvas in Modules. Scientific research articles, also called "papers", are the basis for scientific progress and information exchange. Scientists use scientific methods and logic to obtain and interpret data that are presented in these papers. These published ideas, methods, data, and conclusions are critically analyzed by other scientists who can then repeat and extend the original results. Detailed research papers allow science to be **reproducible**. **For students**, reading scientific articles is important to understand how logic and the scientific method provide the basis for our knowledge.

For the homework assignments, you will upload a **PDF** file of the completed **Answer Form** to **Gradescope** in Canvas under **Assignments**. You should read the whole paper quickly without getting bogged down in the details to understand what the paper is about. Then carefully read the sections and figures related to the homework assignment to answer the homework questions. You do not need to read all of the methods, supporting materials, or appendixes unless they are related to a question. Your answers to the homework questions should be entered into the **Answer Form** (Word docx file) and must fit in the answer fields on **1 side of 1 page**, total. The format is single-spaced, 1-inch margins, 10-point Calibri font. Your answer page must have your **Name**, **PID**, and **Section**. By turning in a homework assignment, you are assuring that your answers are your own work. You should use a spelling and grammar checker. By the due date and time, a pdf file with homework answers should be **uploaded to Canvas** to provide a **time-stamped** assignment.

The IAs **can** help you understand the homework papers at discussion sections and office hours, but they **cannot pre-grade** answers. Although the research articles may be discussed in IA 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 itself or any other source in your answers.** By submitting a homework assignment, you are certifying that it is exclusively your own work. Homework answers will be checked by **Turnitin.com**. No Chegging!

Homework grading will be done using **Gradescope** with a rubric/key developed by the Instructor and IAs 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. 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 only be re-graded if there is a clerical error or other mistake with score. The IAs carefully assign scores for the homework answers, but are not asked to mark corrections or make annotations. A general answer key will be posted on Canvas.

General guidelines for reading scientific research papers:
Research papers are written for people who already know a lot about the subject. You will need to look up information to understand the paper. You should pay attention to the following:
1. Identify the questions being asked in the paper.
   The introduction or the first few paragraphs 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 are presented in the discussion/conclusion section. Think about why the conclusions are important.
3. Examine the experiments and data – the heart of research papers.
   The experiments and data will be summarized in the abstract and will be presented in the Results sections of the paper. What was the question each experiment was trying to address? What was the experimental design?
4. For each experiment:
   Why was the experiment done – what was the hypothesis being tested? How was the experiment done? Examine the data. Consider the author's conclusion and decide if the conclusions are valid. Decide if proper **experimental controls** were included – if not, the results may not be meaningful. 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!

Google "How to Read and Understand a Scientific Paper". For example:

How to Read and Comprehend Scientific Research Articles - YouTube
https://www.youtube.com/watch?v=t2K6mJkSWoA

How to Read and Understand a Scientific Paper: A Step-by-Step Guide for Non-Scientists
https://www.huffingtonpost.com/jennifer-raff/how-to-read-and-understand-a-scientific-paper_b_5501628.html

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. Extended exam times will overlap with the regular exams and usually start at the same time as the regular exams. If OSD exam times for this course conflict with another class, then this course should **not** be taken. It is the student's responsibility to make sure class and exam schedules for all of their classes do not have any conflicts.

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://senate.ucsd.edu/Operating-Procedures/Senate-Manual/Appendices/2

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.