

BIMM 194 / BGGN 283: Microbiology Current Topics 2023 fall - All classes are In-Person

Th 10:30am – 11:50pm; York 3010; Instructor: James Golden, PhD

BIMM 194. Adv Topics-Molecular Bio, Microbiology Current Topics (2 credits)

This class will cover current topics in microbiology from recent scientific review articles and primary research papers. Topics could include areas such as molecular mechanisms of bacterial cell biology; genetics and evolution of traits such as antibiotic resistance; bacterial interactions such as biofilms, symbiosis, or pathogenesis; and microbial biotechnology.

Prerequisites: Molecular Biology (BIMM 100); upper division standing.

Class Schedule

Class – Date	Topic	Reading for class
1 – 9/28	Course introduction, Review of Microbiology	None
2 – 10/5	Review: Cyanobacteria	Cyanobacterial Blooms; Bald Eagle Killer Identified (Science Mag)
3 – 10/12	Research: Cyanobacterial toxins	Eagle Killer (science.aax9050)
4 – 10/19	Review: Antibiotics	New Ways to Squash Superbugs
5 – 10/26	Research: New antibiotic	Antibiotic teixobactin
6 – 11/2	Review: Bacteriophage	Phage Therapy
7 – 11/9	Research: Bacterial interactions with eukaryotic cells	Protein delivery with bacterial injection system
8 – 11/16	Review: Cyanobacterial heterocysts	Making a Heterocyst
HW – 11/19	Homework Due on Canvas by 11:59pm	
* – 11/24	Thanksgiving Holiday	No Class – Happy Thanksgiving!
9 – 11/30	Research: Cyanobacterial heterocysts	Proteolytic regulation of cell division & heterocysts
10 – 12/7	Graduate Student presentations	Graduate-student abstracts

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Office hours: in-person after each class, Th 12:00pm (For longer discussions we will go outside); or by appointment in my office or on Zoom (Zoom link will be on Canvas), just send an email with a few suggested times to meet.

Class Meetings: Classes are in-person and **attendance is required**. There will be a **sign-in sheet** for each class. Class will be interactive and questions, discussion, and participation by everyone in the class is highly encouraged. You will enhance your learning by active participation, asking questions, and expressing your ideas. Social media and sleeping during class are frowned upon.

Class web site: Canvas at <https://coursefinder.ucsd.edu> or <https://canvas.ucsd.edu>

The "**Modules**" section contains pdf files for the syllabus and for the assigned review papers and research papers. Students may also download the assigned papers directly from the publisher for **free**, but only from on-campus or by using VPN. Weekly **Quizzes** (for classes with assigned reading) will be on **Canvas** and will be **graded** to help make sure that each student is **prepared to discuss** the assigned reading in class.

New Financial Aid Requirement: Commencement of Academic Activity. UC San Diego instructors are required to certify whether students have commenced academic activity in order to satisfy the requirement set forth by the U.S. Department of Education (ED). Per the ED, this certification should be done by the end of the second week of instruction. This requirement is satisfied by taking the "quiz" "**First Day Survey: Prior Knowledge #FinAid**" on Canvas. Your responses are private and do not impact your grade in this course.

Grades:

Because the expectation is to have interesting discussions during class, **class attendance is required** and receives **9 points** for each of the 10 class (**90 points total**). Students must **sign in** for each class.

Quizzes will be taken on **Canvas** during the ~24 hours **before each class that has a reading assignment** to help ensure that students are prepared for class discussions. There are no quizzes for the first and last classes of the quarter. The online quizzes will be posted by around noon the day before class. Quizzes are **open-book** but must be taken individually with no collusion or outside help. For this class, open book means you can access the class paper, other research papers, videos, and reference material, but you cannot post the homework question for others to answer or get answers from any other person or group. Your own work and thought are required for your learning so no cheating. There will be **8 quizzes**, each with 6 questions worth 2 points each for a total of **12 points** per quiz (**96 points total**).

Homework assignment. There will be **1 homework assignment** worth **14 points** that is due by 11:59pm on the due date.

There are **no** extra-credit assignments or make-up quizzes, so set a reminder for each quiz. The class does not have a final exam. If a class is unavoidably missed because of circumstances outside of a student's control, then the student should **contact the instructor within 24 hours** of the missed class to obtain instructions for a makeup written report similar to the homework assignment but based on the missed class material.

Final grades will be based on **attendance** and participation in each class, the **8 quizzes**, and the **homework** assignment. The final grade earned for the course will be based on the total points possible, which is: $(10 \times 9 \text{ pts}) + (8 \times 12 \text{ pts}) + (1 \times 14 \text{ pts}) = \mathbf{200 \text{ points total}}$

The grade scale is a little lenient such that missing 1 class and its quiz without doing a makeup assignment means a loss of 21 points, but that is still an A-.

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Minimum Score	194	180	174	168	162	154	148	142	134	128	<128
Percent	97	90	87	84	81	77	74	71	67	64	<64

Homework (HW) written assignment:

For the homework assignment, students will **find and read about a microbiology topic** that they personally find **fascinating** and then **write a 1.5- to 2-page paper** on the topic with an emphasis on **proposing questions** about the topic that need to be **answered by future research**. Students should search and read reliable sources to identify their **microbiology (bacteria, fungi, or viruses) topic**, and then read and collect information from reliable sources on their specific chosen topic. **Reliable sources** include professional unbiased journalism and education organizations, professional scientific societies, and peer-reviewed scientific publications in journals from major publishers.

The assignment should have 1 paragraph that **introduces the topic** and provides background or history, 1 paragraph on **current knowledge or research** related to the topic, 1 paragraph describing why the topic is **significant and important**, and 1 or 2 paragraphs stating interesting **unanswered questions** about topic that might be answered by **future research**. Students should include the **references** for their source(s) at the end of the assignment (usually 3 to 6 references). Any standard format for the citations and references is ok. The HW assignment is expected to be 1.5 to 2 pages, single spaced, 11 pt. Arial font (or equivalent).

Homework Outline:

1. Introduction & Background
2. Current Knowledge
3. Significance & Importance
4. Questions & Future Research

The HW should be **submitted on Canvas as a docx, or pdf file**. A spelling and grammar checker should be used, and the assignment should be carefully proofread. The homework assignment should be **uploaded to Canvas Assignments** (or possibly Gradescope, I'll let you know) **by 11:59 PM on the due date**. Students must **write their own HW independently and in their own words – no Generative AI**. The

assignment must be in the student's own words. **Do not copy or plagiarize** articles, web pages, or any other source. By submitting a homework assignment, students are certifying that it is exclusively their own work. Students can discuss topics with others, but **all HW assignments are expected to be different from each other**. Homework assignments will be automatically checked by Turnitin.com.

BGGN 283 Graduate Students ONLY: Graduate students taking BGGN 283 have an additional requirement for the course that is directly related to their **homework assignment**. Graduate students will prepare a one paragraph (about 250 words) **abstract based on their homework assignment** and a **5-minute computer presentation** that will be presented to the class during the **last class period**. The abstract should be uploaded to Canvas or emailed to the instructor by the Monday before the presentations for the class to read. For the presentations, the goal will be to introduce the class to an interesting and important current microbiology topic. The presentations will be followed by questions from the class (2 minutes). The presentations should include about 5 or 6 slides. A title and introduction (1 slide), background (1 or 2 slides), the importance/significance of the topic (1 or 2 slides), the current state of understanding (1 or 2 slides), and future directions or what needs to be done next (1 slide). Because the presentations are short, it will be important to limit the amount of information that is presented and to practice the presentation to check the timing. To avoid duplication of topics, graduate students should discuss their topics with each other and the instructor about 1 week before the homework assignment is due.

General guidelines for reading research papers:

Research papers are written for people who already know something (or a lot) about the subject matter. Students will need to look up definitions and other information to understand the paper. Students are not expected to understand everything in the articles, but should pay attention to the following:

1. Identify the questions being asked in the paper – the author's hypotheses.

Frequently 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. Determine why the conclusions are important.

3. Examine the data and 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. What was the **question** (hypothesis) each experiment was trying to address? What was the **experimental design** (the approach and logic) used to answer the questions? What do the data show? Did the experiment answer the question or not? Are the authors' conclusions strongly or weakly supported by the experimental data?

4. For each individual experiment:

Determine **how** the experiment was done. Examine the **data**. Consider the authors' **conclusions** and decide if the conclusions are valid. Decide if proper **experimental controls** 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!

Search "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)

<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. It is the student's responsibility to make sure class and exam schedules for all their classes do not have any conflicts.

Statement on Academic Integrity: Please see information linked in Canvas.

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 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 cannot 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: don't cheat!)

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.