BIMM 194 / BGGN 293: Adv Topics - Microbiology, fall 2019

Tu 5:00pm – 6:20pm; YORK 3010; Instructor: Dr. James W. Golden

BIMM 194. Microbiology (2)
This class will cover current topics in microbiology with a focus on bacteria. Topics will be selected from current review articles and 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

Week – Date	Class Topic	Reading
1 – 10/1	Course introduction, Review of Microbiology	None
2 – 10/8	Review: cyanobacteria	Cyanobacterial Blooms
3 – 10/15	Research: cyanobacterial flocs	Floc Formation and Structure in the Cyanobacterium *Synechocystis*
4 – 10/22	Review: evolution antibiotic resistance	The evolution of antibiotic resistance
5 – 10/29	Research: antibiotic resistance plasmids	Persisters promote antibiotic resistance plasmids
6 – 11/5	Review: bacterial interactions and nanomachines	Phage tail-like particles are versatile bacterial nanomachines
7 – 11/12	Research: bacterial interactions with eukaryotic cells	Bacterial Phage Tail-like Structure Kills Eukaryotic Cells
HW – 11/15	Homework Due	
8 – 11/19	Review: microbial biotechnology	Synthetic biology of cyanobacteria
9 – 11/26	Research: engineering production in specialized cells	Enhancing Light-Driven 1,3-Propanediol Production …
10 – 12/3	Graduate Student 5-minute presentations and 5-minute discussion	5 graduate-student abstracts

Instructor: Dr. James W. Golden
Office: 4832 AP&M (Applied Physics & Mathematics); Phone: (858) 246-0643
Email: jwgolden@ucsd.edu (please put BIMM 194 or BGGN 293 in subject line)
Office hours: after each class for 10-15 minutes; or by appointment (just call or send email with a few suggested times to meet)

Class Meetings: Attendance at each scheduled class is **required** and is a major part of the grade. Students will **sign in** at each class with their signature. Classes will be interactive with participation by everyone in the class.

Class web site: **Canvas** at https://coursefinder.ucsd.edu or https://canvas.ucsd.edu
The "**Files**" section contains pdf files for the syllabus and for the assigned review 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** will be on **Canvas** and will be **graded** to help make sure that each student is **prepared to discuss** the assigned reading in class.

Grades:
Attendance and **Participation** is required and count for 15 points for each class (150 points total). Students will **sign in** for each class. Student are expected to volunteer to discuss or answer questions about the assigned reading in class.

If a class is **unavoidably** missed because of circumstances beyond the student's control, then the student must submit a **signed** written excuse sent from their **@ucsd.edu** email address with an explanation of the circumstances **within 24 hours** of the missed class. The online quiz should still be taken on time, and a makeup assignment will be assigned.

There will be **8 quizzes**, each with 5 questions worth 1 point each for a total of 5 points per quiz (40 points total). Quizzes will be taken on **Canvas (open book)** during the day before each class. Quizzes will usually be posted the evening before the day of class. Each student is required to take the quizzes **independently** with **no** input or collusion with others.

Homework assignment. There will be 1 **homework assignment** worth 10 points and due by 11:59 PM on **November 15**.

Final grades will be based on attendance and participation in each class, the 8 quizzes, and the homework assignment.

There are **no** extra-credit assignments or make-up quizzes.

The final grade earned for the course will be based on the total points possible, which is 10x15 + 8x5 + 10 = **200**. Missing 1 class and quiz means a loss of 20 points.

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Minimum Score	193	180	177	170	163	156	149	142	135	128	<128

Homework (HW) written assignment (10 points):

For the homework assignment, students will **search and read about** a microbiology topic that they personally find **fascinating** and then **write** a minimum of **3 paragraphs**: **one or two paragraphs** summarizing the topic and current knowledge, **one or two paragraphs** stating where the topic is heading in the future, and **one or two paragraphs** stating why the topic is awesome. Students may include links to their sources at the end of the assignment. The HW assignment is expected to be 1 to 2 pages, single spaced. The HW should be **submitted as a docx, or .pdf file**. A spelling and grammar checker should be used, and the assignment should be proofread. The homework assignment should be **uploaded to Canvas by 11:59 PM on the due date**. Students must **write their own HW independently and in their own words.** Do **not** copy or plagiarize articles or any other source in the assignment. 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 293 Graduate Students ONLY: Graduate students taking BGGN 293 have an additional requirement for the course. Graduate students will prepare a 5-minute computer **presentation** and 1-paragraph **abstract** on their **homework assignment** that will be presented to the class in the **last class session**. The goal will be to educate the class on an interesting and important current topic and answer questions from the class related to their presentation. The presentation should include 5 to 8 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 (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 send their topic to the instructor 2 weeks before the homework assignment is due.

General guidelines for reading the papers:
Research papers are written for people who already know something 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.

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 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** each experiment was trying to address? What was the **experimental design**? What do the results show? Did the experiment answer the question or not? Are the author's conclusions supported by the experimental data?
4. For each experiment:
   Determine **how** the experiment was done. Examine the data. Consider the author's conclusion about the experiments 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
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 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.