

General Microbiology

BIMM 120

Summer Session II 2022

Instructor: Tara Spencer

Office: Tata Hall 4014

Office Hours: Thursdays @10 AM

Email: t2spence@ucsd.edu (Please put BIMM 120 in the subject line)

Instructional Assistant: Krystal Bosmans

Office: Starbucks @ Price Center/Zoom (See Canvas LTI Pro)

Office Hours: Wednesdays @9:50 AM

Email: kbosmans@ucsd.edu (Please put BIMM 120 in the subject line)

Welcome to BIMM 120!

This class is designed to give you a foundational understanding of microbiology, and the role that microorganisms play in our daily lives. This class is only open to non-biology majors, and it is my desire that you will also see the connection between your own fields and microbiology.

Learning Objectives

My goal for you all is that by the end of this class you will be able to:

- 1) Appreciate the history of the field of microbiology.
- 2) Understand basic principles of general biology and immunology that are needed to understand general microbiology.
- 3) Appreciate the complexity and diversity of microbial life.
- 4) Describe modern-day methods used by microbiologists to advance science.
- 5) Appreciate the importance of scientific research in the establishment of microbiological principles.
- 6) Defend the role and impact of microbiology on everyday living.
- 7) Illustrate the beauty that lies within microbial ecosystems.
- 8) Appreciate how cool and essential microbiology are!

Course Website

We will be using [Canvas](#) in this class. All course materials and assignments will be posted here, and you will also submit them here.

If you are taking this class through UCSD Extension, it is imperative that you email the Extension Office to get access to Canvas ASAP.

COVID-19 Guidance

The syllabus is subject to change, due to campus efforts to contain COVID-19. These changes will be communicated at the earliest opportunity via Canvas Announcements. You may find it useful to ensure your Canvas settings are such that you receive Announcements via email as well.

General COVID-19 guidance from the UCSD campus can be found [here](#).
You can also find support for virtual learning [here](#).

Podcast/Zoom Recordings

This class is scheduled to be held in person. Each lecture and Discussion Section will be recorded on Zoom and posted on Canvas under Modules.

In the event that the class is forced to be remote due to a change in the COVID-19 pandemic, the class will be held on Zoom and all recordings will be shared on Canvas under Modules.

Lectures

All lectures will be held on **Mondays** and **Wednesdays** from **11 AM - 1:50 PM** in **Warren Lecture Hall 2111**. Due to the ongoing pandemic and current surge of a highly contagious strain, attendance is not mandatory. However, it is highly recommended that you attend lectures so that you have the opportunity to ask questions, and for the immersive experience of active learning (which has been proven to enhance student learning and information retention).

Textbook

In this class we will use *Brock Biology of Microorganisms* (14 to 16th edition are acceptable) by Madigan et al.

To best prepare for the lectures indicated on the class schedule, you should read the chapter(s) from the textbook that is assigned to each lecture.

Films, Short Videos and Podcasts

Throughout this class, you will be assigned two films and several short videos. These are required materials and serve to review some of the material that is done in class.

There will be times when I recommend listening to an episode of the podcast *This Podcast will kill you*. This is **not mandatory**, but this podcast is amazing and does a great job of explaining several microbiological principles that we will discuss in class. You can also get **extra credit** by listening to episodes from the podcast (See **Extra Credit**).

Discussion Sections

Discussion sections will be held in person as follows:

Section #	Days	Times	Location
A01	Monday, Wednesday	3 PM - 3:50 PM	WLH 2209
A02	Monday, Wednesday	4 PM - 4:50 PM	WLH 2209

Important dates for the UCSD academic year can be found [here](#).

As with lectures, attendance is not mandatory but is *highly* encouraged!

Midterms and Final Exam

The midterm exam will be held in person on **August 15th @ 11 AM in Warren Lecture Hall 2111.**

The final exam will be a take-home exam due on **September 2nd @ 11:30 AM.**

For each exam, you are required to bring your Student ID - it will be required for you to submit your exams.

The final exam will be **cumulative** - however, only **25%** of the exam will cover material that was tested on the midterm.

Missed Exams

Alternate exams will **only** be scheduled in the case of an emergency. Please check your schedule to ensure that you have no clashes. You are responsible for clearing the absence from the exam with me before the exam date (unless it is an *extreme emergency that can be documented* in which case I must be notified within 24 hours).

Exam Regrade Policy

The regrading of examinations will be considered **unusual**, rather than a routine request. Exams must be written **in pen (NO PENCIL)** to be considered for regrading. In order to submit a request for regrading, please submit the following:

- 1) The **original** copy of the exam
- 2) A brief explanation of the regrading request.

Please submit your regrade request within **ONE WEEK** of the return of the graded examinations. It is understood that by submitting this regrade request, you agree to accept the score of the entire regraded examination, not the original score. So if we identify additional errors to those highlighted in the first round of grading, points will be deducted therein.

Due to time constraints, we will not be able to regrade the final examination.

Exam Review Sessions

Exam Review Sessions will be held by me; they will take place in the discussion section right before the exam. Additionally, in the last half hour of the class preceding each exam, there will also be a short review exercise that can be submitted for extra credit. The exercise will be held in person during class, but since attendance is not mandatory, the exercise will be due **the night before the exam.**

Course Grade

Your grade in this course will be weighted. It is worth noting that each exam will be graded on a curve (the final grade will not be curved, just the exam scores)

Minute Papers (100 points)	10%
Post-Class Quizzes (200 points)	20%
Weekly Assignments (200 points)	20%
Midterm Exam (250 points)	25%
Final Exam (250 points)	25%
Total # of points = 1000 points	

How can I do well in this class?

1. **Read the chapters before coming to class.** This requires you to read the schedule ahead of time. It is scientifically proven that information retention from lectures is enhanced by taking the time to read relevant material before class (and after too!).
2. **Take intentional notes.** You are not required to know all the material that is found in the textbook. However, it will be helpful for you to take notes from the assigned readings and review them before coming to class, although the content will be repeated in class. That way, you can focus more on the discussion and reduce your note-taking then.

You are also encouraged to take notes during class. Regarding lecture notes, I would like to encourage you to take notes of things that are emphasized, and especially to note things that are not explained in detail in the slides. There is only so much that the PowerPoint can display, and the rest of it will be verbalized by me.

3. **Attend lectures (or listen to them!).** Even better than reading the material ahead of time and doing the post-lecture quizzes, is that the information will be reiterated in class. There is a lot of material that will be covered in class that is not covered in the textbook. In order to do well in this class, you will have to read the text *and* attend lectures.
4. **Review (or rewrite) lecture notes within 24 hours.** While it is helpful to read ahead, pay attention during lectures and take notes, the final piece to this puzzle is to reread the notes within 24 hours. There is also extensive research showing the role of note review in the retention of lecture material in the long term.
5. **Formulate questions from the learning objectives and practice answering them.** The learning objectives are what I (and all course instructors) use to devise the lecture material and the examinations. They are the things I want you all to know by the time the course is over! It will be in your best interest to devise questions for yourself to practice based on the learning objectives of the class, and of each lecture.
6. **Practice doing the weekly assignments on your own.**
7. **Collaborate with your classmates.** You're all in this together! Please know that you are not alone as you endure the challenges associated with taking a new class. You guys can help each other. Moreover, there is scientific evidence that collaboration can lead to long-term retention of information.
8. **Come to office hours.** I am here as your instructor to ensure that you can succeed in this class. Please communicate with me if there is a challenging topic, and we can go over it together during office hours.
9. **Give me feedback when asked!** This is not my class - it is ours. I want to ensure that you all have the best learning experience that you can have. I was once a student too, and I still am, so I understand what it is like to learn new material in a new context. As

part of your minute paper, you have the option to write if something in the class is not working (e.g. Do you feel that the workload is overwhelming? Would you like to improve the inclusiveness of the class?). I will literally take any feedback!

Extra credit

I am a proponent of inclusive learning strategies, and I know that some students are built to do well in some assignments, while others might struggle with them. I also know that life happens and sometimes you might miss an assignment. I have devised what I think is a fair way for students to get extra credit while still having the opportunity to learn the material thoroughly:

- (1) Exam Review Exercises: Before each exam, there will be an exam review session in class. In this review session, I will give you all an exercise to help you prepare for the exam. It is not mandatory, but if you complete it, you will get extra credit **on the exam in question**. You can get **5 extra credit points on each exam**. For those unable to attend the class in person, it will also be posted on Canvas. It must be completed before the exam in question to get full credit!
- (2) *This Podcast Will Kill You*: In the class schedule, there are a few episodes of the podcast that I have suggested, but which are **not mandatory**. They are good to listen to mindlessly, to help the information to stick more (or perhaps they do a better job of explaining things than I do). If you listen to any of the episodes and write a short paragraph to describe the contribution of one person, mentioned in the podcast, to science, you can get a **maximum of 5 extra credit points added to any one exam** (i.e. you can do this twice and get 5 points on either exam).
- (3) Microbe Advertisement. As you will learn in this class, microorganisms are ubiquitous and make up the majority of the cells on our planet. They play important roles inside of the hosts they live in, and we can also use them to advance scientific knowledge. However, some microorganisms cause disease.. As an extra credit assignment, advertise your favourite microorganism using creative means. This project could either be aimed at encouraging people to embrace the microbe, or to be wary of it! You can create any artwork, social media post, or literature piece for this assignment. Upon completion, you can receive up to **10 extra credit points on your final exam**. However, this must be submitted before the midterm exam to get full credit!
- (4) Each exam will also have extra credit questions.

Academic Integrity

The University of California, San Diego has an established [Academic Code of Conduct](#) which outlines the high priority that the school places on **academic integrity**. BILD 30 students are expected to adhere to the highest standards of academic integrity and honesty. In summary, all academic work assigned in this class will be completed by those to whom it is assigned, and only authorized aid is permitted for use. This means that the minute papers, midterm, and final exams are to be done individually. You are prohibited from cheating on exams, plagiarizing papers, submitting the same paper for credit in two courses without authorization, buying papers, submitting fraudulent documents, and forging signatures. However, you are allowed to collaborate for the podcast assignment, and for the weekly assignment (for the latter,

collaboration is mandatory), and you are allowed to communicate personal and academic challenges that might affect your performance with me.

Academic dishonesty is any means employed to attain course credit in any unauthorized manner. BILD 30 students are academically honest; they work hard for their grades, collaborate with their colleagues, and communicate any personal or academic challenges with the instructor. Academic dishonesty will not be tolerated in this or any class on campus. Any student who is caught participating in academic dishonesty may receive a failing grade or may be suspended. Your future is not worth risking trying to get a better grade by cheating.

Accessibility

The University of California, San Diego is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students in need of accommodations due to a disability should contact the [Office for Students with Disabilities \(OSD\)](#) for verification and determination of reasonable accommodations as soon as possible at the beginning of each quarter. After you do this, please notify me of the accommodations being made.

Discrimination and Harassment

The University of California, in accordance with applicable federal and state laws and university policies, **does not discriminate** on the basis of race, color, national origin, religion, sex, gender, gender identity, gender expression, pregnancy (including pregnancy, childbirth, and medical conditions related to pregnancy or childbirth), physical or mental disability, medical condition, genetic information, ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services (including membership, application for membership, performance of service, application for service, or obligation for service in the uniformed services). The university also prohibits harassment based on these protected categories, including sexual harassment, as well as sexual assault, domestic violence, dating violence, and stalking. The nondiscrimination policy covers admission, access, and treatment in university programs and activities.

If students have questions about student-related nondiscrimination policies or concerns about possible discrimination or harassment, they should contact the [Office for the Prevention of Harassment & Discrimination \(OPHD\)](#) at (858) 534-8298. You may also [report bias](#) here.

Campus policies provide for a prompt and effective response to student complaints. This response may include alternative resolution procedures or formal investigation. Students will be informed about complaint resolution options. A student who chooses not to report may still contact [CARE at the Sexual Assault Resource Center](#) for more information, emotional support, individual and group counseling, and/or assistance with obtaining a medical exam. For off-campus support services, a student may contact the Center for Community Solutions. Other confidential resources on campus include [Counseling and Psychological Services](#), [Office of the Ombuds](#), and [Student Health Services](#).

Inclusion

If you have any ideas on how we can make this class more inclusive, please email me at t2spence@ucsd.edu, or you can contact the Office of Diversity, Equity and Inclusion:

Email: diversity@ucsd.edu

Website: <https://diversity.ucsd.edu/> <https://students.ucsd.edu/student-life/diversity/index.html>

This course is a *flipped* course: for some of the lectures outlined below in the schedule, there will be pre-class material posted on [Canvas](#) that must be completed *prior* to attending class. These are designed to mentally prepare you for the class, and to assist you with information retention (and thus success in the class!).

Class Schedule

Date	Lecture #	Topics to be covered	Reading in <i>Brock (14th edition)</i> , film/video
8/1	1	History of Microbiology Microbial Cell Structure and Function	Chapter 1: Microorganisms and Microbiology Chapter 2: Microbial Cell Structure and Function
8/3	2	Microbial Nutrition, Energetics and Metabolism	Chapter 3: Microbial Metabolism Chapter 13: Metabolic Diversity of Microorganisms
8/8	3	Molecular Biology of Microorganisms	Chapter 4: Molecular Microbiology
8/10	4	Microbial Growth and Control	Chapter 5: Microbial Growth and Control
MIDTERM EXAM: August 15th @ 11 AM in Warren Lecture Hall 2111			
8/17	5	Microbial Genomes, Genomics and Genetic Engineering	Chapter 6: Microbial Genomics Chapter 11: Genetic Engineering and Biotechnology
8/22	6	Metabolic Regulation	Chapter 7: Metabolic Regulation
8/24	7	Microbial Diversity Viruses, Viral Genomes and Diversity	Chapter 15: Diversity of Bacteria Chapter 17: Diversity of Eukaryotic Microorganisms Chapter 8: Viruses and Virology Chapter 9: Viral Genomes and Diversity
8/29	8	Microbial Ecology and Environmental Microbiology	<u>Life On Us: A Microscopic Safari Episode 1 and 2</u> Chapter 18: Methods in Microbial Ecology Chapter 19: Microbial Ecosystems
8/31	9	Microbial Pathogenesis and Immunology Vaccines	<u>How Bacteria Rule Over Your Body</u> <u>How The Immune System Actually Works</u> <u>You are Immune Against Every Disease</u> Chapter 23: Microbial Interactions with Humans

			Chapter 24: Immunity and Host Defense
TAKE-HOME FINAL DUE: July 29th 2022 @ 11:59 PM			

* Not mandatory but extremely helpful and can give you extra credit.

Class Schedule

Date	Lecture #	Topics to be covered	Reading in <i>Brock (16th edition)</i> , film/video
8/1	1	History of Microbiology Microbial Cell Structure and Function	Chapter 1: The Microbial World Chapter 2: Microbial Cell Structure and Function
8/3	2	Microbial Nutrition, Energetics and Metabolism	Chapter 3: Microbial Metabolism Chapter 13: Metabolic Diversity of Microorganisms
8/8	3	Molecular Biology of Microorganisms	Chapter 6: Molecular Information Flow and Protein Processing
8/10	4	Microbial Growth and Control	Chapter 4: Microbial Growth and Control
MIDTERM EXAM: August 15th @ 11 AM in Warren Lecture Hall 2111			
8/17	5	Microbial Genomes, Genomics and Genetic Engineering	Chapter 10: Microbial Genomics and other Omics Chapter 11: Biotechnology and Synthetic Biology
8/22	6	Metabolic Regulation	Chapter 7: Microbial Regulatory Systems
8/24	7	Microbial Diversity Viruses, Viral Genomes and Diversity	Chapter 15: Ecological Diversity of Bacteria Chapter 18: Diversity of Microbial Eukarya Chapter 5: Viruses and their Multiplication Chapter 11: Viral Genomes and Diversity
8/29	8	Microbial Ecology and Environmental Microbiology	<u>Life On Us: A Microscopic Safari Episode 1 and 2</u> Chapter 19: Taking the Measure of Microbial Ecosystems Chapter 20: Microbial Ecosystems
8/31	9	Microbial Pathogenesis and Immunology Vaccines	<u>How Bacteria Rule Over Your Body</u> <u>How The Immune System Actually Works</u> <u>You are Immune Against Every Disease</u> Chapter 24: Microbial Symbioses with Humans Chapter 26: Innate Immunity

			Chapter 27: Adaptive Immunity
TAKE-HOME FINAL DUE: July 29th 2022 @ 11:59 PM			

* Not mandatory but extremely helpful and can give you extra credit.