Microbiology

BIMM 120

Fall 2023

Instructor	Cindy Gustafson-Brown (Dr. Gus)		
Office	Humanities & Social Sciences 1145F		
office hours	Fridays, 1:00-1:50 PM, starting Oct 6, in Center 217A		
	Office hours can be found on the Canvas calendar exceptions:		
	 Fri, Oct 13, office hours will be moved to 4-5 PM Fri, Nov 10 is a holiday; they will be moved to Mon, Nov 13, 1-1:50 Fri, Nov 24 is a holiday; they will be moved to Mon, Nov 27, 1-1:50 		
email	cgb@ucsd.edu IF YOU EMAIL, PUT <u>BIMM 120</u> IN THE SUBJECT LINE.		

IN YOUR EMAIL, INCLUDE YOUR:

- First and last name
- PID
- Section number
- IA name

Please present your questions about course material <u>in person</u> during office hours, not by email. I cannot guarantee an answer to your email, unless it is an urgent issue.

Welcome to BIMM 120!

This course covers the structure, growth, physiology, molecular genetics, genomics, and ecology of prokaryotic microorganisms, with emphasis on the diverse activities of bacteria and on the interaction of various bacterial species with their environment. It is an advanced and fast-paced course. Nearly all lectures will be in person.

Prerequisites:

- BILD 3
- BIBC 100 or BIBC 102 or CHEM 114A or CHEM 114B
- BIMM 100

Preparation and expectations

To do well in BIMM 120, students should have a strong background in **general biology** and **organic chemistry**. It is assumed that students know basic **biochemistry** (the major types of molecules found in cells), as well as introductory **cell biology**, **molecular biology**, **genetics**, and the significance of the **scientific method and experimental design**. Wewill not specifically cover these principles in class, because students should already know this material from their prerequisites. Students are responsible for any remedial learning required to understand the material presented in this course.

Classroom etiquette

Because this is a large lecture class, minimizing distractions is important. Please have respect for your classmates and the instructor by turning off or silencing cell phones, not talking, and minimizing other distracting activities in class. This includes non-class-related activities on your laptop, which distract those behind you.

Textbooks

Required textbook

We will use an online, custom textbook, compiled by UCSD faculty through a company called *Veloxsci*. It contains mini-reviews on specific topics written by experts on each subject. We will use the readings from this textbook throughout the course, in particular for homework. There are many additional articles in this book that we will not get to. Consider the extra articles to be a free perk, for those who are interested in reading more about current topics in microbiology!

This online text is available at the cost of **\$15** for the whole quarter on the publisher's website.

To purchase and access the *Veloxsci* textbook, navigate to the following link:

https://www.veloxsci.com/texts/pe60xm21-1695370-1-linked

If you do not yet have a Veloxsci account, you will be prompted to make an account and then directed to the page where your purchase can be made.

Alternatively, you can do the following:

- 1. After signing up for a Veloxsci student account, navigate to the "Find a Text" tab.
- 2. Here, the easiest way to find the correct text is to copy & paste the following code into the "Text ID" box: **PE60XM21-1695370-1-linked**
- 3. Click "Fetch!"
- 4. Click "Purchase This Text," and complete the payment form.
- 5. The text can then be accessed by navigating to the "My Texts" page.

Note: If you forget the password to log into the Veloxsci website and you ask to reset your password, the reset link will be automatically sent into the Spam folder of your UCSD email (UCSD quarantine). Every day we all received an email from UCSD Spam Quarantine, but you might have it filtered into a folder somewhere. Open one of those emails, and click on "Manage your account" in the top right of the email message to access the UCSD Quarantine folder.

Optional textbook – through Inclusive Access (from which you must opt-out)

Microbiology, an Evolving Science, 6th ed., by Slonczewski & Foster, published by W.W. Norton, is highly recommended for background reading to reinforce the lecture topics, but it is NOT required. On Canvas in the "Administartive details" module, I will post the pages from this textbook on which the lecture material is based, so you may read along.

The reason for listing the Slonczewski book as "required" on the schedule of classes, is to provide you with the *option* of accessing the 2023 version (the latest edition) through the "inclusive access program," at a much lower cost than you can find otherwise. Unfortunately, the publisher does not make older editions available as eBooks.

Through "inclusive access," the Slonczewski book is automatically provided to everyone in the class, starting on day 1. From Canvas you can register and access the textbook without the need

for a passcode. (The publisher is Norton.) The book is free for the first two weeks. After that you will be automatically charged by UCSD. If you do NOT want to pay for online access to this book, please "Opt out" of the inclusive access program, otherwise the university will charge you. Look for an email from the portal in your UCSD .edu email.

The opt-out deadline of October 13,2023, at midnight.

Until that date, you may opt-out and opt-in as many times as you like.

If you have opted-out as of Oct 13, you will not be able to access the book online after this date.

The opt-out portal is: <u>https://accessportal.follett.com/2298</u> This is also posted on Canvas.

If you would like to purchase used, hard-copies of the 4th or 5th edition, instead, you may find those from 3rd party vendors online for a bargain.

There is at least one copy of the 6th edition on **reserve** at the Geisel Library 2nd floor service hub.

I have also posted a page in the "Administrative details" module titled, "Free Online Textbooks and Microbiology Resources.)

Podcast

This course will be available at <u>podcast.ucsd.edu</u> There are occasionally problems with the podcast, that are out of my control.

Instructional assistant office hours

are posted on Canvas, in the "Administrative details" module, and are found on the Canvas calendar

How will this class work??? What do I do???

1. Short videos or online tutorials

These will occasionally be posted on Canvas prior to a lecture, to aid in understanding the material. Students should view this material before class. They will be covered on the exams.

2. Lecture

We will have in-person lectures M/W/F in Center 101.

The lecture topics are listed in the schedule at the end of the syllabus.

A list of readings from the Slonczewski book, on which the lectures are based, will be posted on Canvas.

Attendance is not required, but strongly recommended, because coming to lecture will improve your success. The exams will be largely based on the lecture material.

I will post my PowerPoint slides after class, but they do not contain all my notes. Slides are mainly for announcements, diagrams, graphs, photos, and other illustrations. I may use the boards during class, which will not show up in the podcast. If I forget to post the slides by the same evening, don't hesitate to send me a reminder!

3. Discussion sections

This quarter, the School of Biology has modified the discussion section to be entirely online. We will choose a time in consultation with the students and the IAs, to accommodate as many students as possible. In the discussion section you will get practice exam questions and work on activities to help you learn more and prepare for exams.

4. Office hours

Students are encouraged to come to **Dr. Gus' office hours**, which will be Fridays after class. The day/time/location can be found on the Canvas calendar. *Please note the three schedule adjustments listed at the beginning of the syllabus*.

Even if you don't have questions prepared in advance, do come! If you are struggling or you don't know where to start, do come! I'm happy to tutor you. Even if you want to talk about other things, like grad school or career options, do come! I also make appointments for private zoom calls or meetings.

Students are also encouraged to attend the office hours of **the IAs, Asama and Ericsson**. They are found in the "Administrative details" module on Canvas, and also on the Canvas calendar. You may attend the office hours of either IAs, throughout the week. They are eager to help you be successful! Often, there are not many students at IA office hours, so you may get one-on-one tutoring ... that's a great deal!

<mark>5. Films</mark>

There are three required **films** posted in the "Films" module on Canvas for you to watch.

Each film is assigned in lieu of a lecture (see the schedule), so you are NOT required to come to class that day. One film is covered on each exam.

The films may be accessed by one of the following means:

- directly through the publisher's web site
- through UCSD library digital reserves for BIMM 120

In order to access UCSD digital reserves, you must be within the UCSD protected network or use a VPN. There is a link on the "Films" page with instructions for setting up a VPN.

How to study the films: You should take notes when you watch them, and review your notes before the exams. Do NOT worry about exact dates, numbers or statistics in the films. Instead, focus on the

- biological concepts
- stories
- history (major events and general time frame)
- prominent persons
- policy issues
- causes of controversies
- impact of the situations described on individuals and society
- arguments of different stake-holders
- appropriate and inappropriate responses

For each part, or chapter, of the story you should be able to say something intelligent about what the message was. What did the filmmaker want to communicate; what did they want you to get out of the film? What questions would YOU design if you were writing the exam?

Do NOT wait to the last minute to watch the films, in case there is a technical glitch!

- First film *What's Living in You?* (1 hour) Covered on the 1st midterm.
- Second film *Human Nature* (2 hours) Covered on the 2nd midterm.
- Third film *Hunting the Nightmare Bacteria* (1 hour) Covered on the final exam.

6. Reading in the Veloxsci textbook, plus accompanying homework.

There will be 7 articles assigned to read. Each will be accompanied by a homework, posted at least 5 days in advance. The prompt will appear on Canvas, if you click on "Assignments" in the blue menu on the left side. Each homework will be due Sturday night at 11:59 PM. Information about submitting these assignments will be provided in the prompt.

7. Exams

Exams will be in-person, closed-notes/closed-book. Question types will include true/false, multiple choice, and short to medium-length free-answer questions. You will be accountable for all material covered in lecture, PowerPoint slides, required reading in Veloxsci, assigned videos/tutorials, and films.

BRING STUDENT ID. It will be checked at the exam.

Exams will be graded using the **Gradescope** program, which will *only* see your answer if you place it within the designated box. If you answer is not within the box (or blank), it will not be graded. Your handwriting must be legible; we will disregard answers which cannot be deciphered.

One **old exam** is posted on the course web site. The material will not be exactly the same or covered in the same order. Use the old exam to become familiar with my <u>style</u> of exams, but don't assume the material is exactly the same. An old exam is not a review sheet.

Review sheets will be posted on Canvas a few days before each exam.

The IAs will conduct a review session before each exam.

a. Two midterms (21% and 22% of the course grade, respectively)

These were *originally* scheduled to be in the evening, so that we could reserve a room large enough to spread out our students in the extra chairs. However, we are currently meeting in a lecture hall that is more than large enough to sit every-other-seat. Therefore, we will hold the exams *in our usual room during normal lecture times.*

Midterm 1: Mon, Oct 23, 12-12:50 PM, FAH 1301

Midterm 2: Fri, Nov 17, 12-12:50 PM, FAH 1301

b. Final exam (34% of the course grade)

Thurs, Dec 14, 11:30 AM - 2:30 PM.

Note: *This is at the <u>end</u> of finals week. Yes, it is a bummer. No, you cannot leave town before this exam is scheduled.*

The final exam will be **comprehensive** for all course material (except for the first two films). There will be an emphasis on the last part of the course. The final exam will only cover the third film, NOT the two films that were already covered on the midterms.

Missed exams

Make sure your class schedule has NO conflicts with the midterms or the final exam! There are no alternate exams for scheduling conflicts. Under NO circumstance will an exam be given online in BIMM 120.

If you know in advance you must miss an exam due to an unavoidable situation (e.g. surgery), it is your responsibility to clear it with Dr. Gus as soon as the conflict becomes apparent.

If a spontaneous emergency (*e.g.* illness or accident) arises, you must contact Dr. Gus within 24 hours of the missed exam.

Do not ask to reschedule an exam for any reason other than a *dire emergency*. Make-up exams are decided case-by-case. They *may* be an oral or essay exam.

You can find the up-to-date UCSD policy on Covid here: <u>https://returntolearn.ucsd.edu/return-to-campus/exposure-contact-tracing/index.html</u>

Regrades

See regrade policy on Canvas.

Course grade

This course will be graded on a curve. The class average will be a B. Grades will include pluses and minuses

weight
23%
21%
22%
34%

You must achieve at least 50% of the total points <u>on the three exams</u> in order to pass the class with a C minus.

How can I succeed in BIMM 120?

- 1. See the information on the "**Effective studying and learning**" page of the "Study aids" module on Canvas. There is a lot of practical information there about how to get the most out of your studying time.
- 2. Utilize the other **study aids** provided on Canvas.
- 3. **View** any posted videos/tutorials <u>before</u> lecture. You will understand the lectures better and learn more. They will be covered on the exams.
- 4. **Come** to lecture and sit toward the front.
- 5. Review your notes within 24 hours of the lecture.Even more effective: rewrite (outline) your notes within 24 hour of the lecture.You are accountable for all lecture material.
- 6. **Review** the PowerPoint slides with your lecture notes. PowerPoint slides will NOT contain the instructor's notes. They will contain announcements, illustrations, graphs, diagrams, and photos which augment the lecture. They will be posted after each lecture. You are accountable for everything in the PowerPoint slides.
- 7. Listen to the podcast for anything you missed.
- 8. **Study** a little bit several times per week. <u>Repetition over time</u> is the key to retaining information. Your goal is to establish new neural pathways in your memory and fire them often! Cramming does not accomplish this.

- 9. **Study** with other students, and choose those who are serious about academics. Make up questions and quiz each other. Anticipate potential exam questions. This is a strategy that has been demonstrated to increase student learning.
- 10. **Keep up with the reading in Veloxsci**. If you bump into material that is too technically challenging, *don't get bogged down*. Skip it (temporarily). Return to the most difficult material later.

Outline the important points as you read. This will help you remember the flow of information and contextualize the details. You will <u>not</u> remember the reading unless you take notes. Use index cards, or a notebook, to summarize the important points.

- 11. Look up words you don't understand.
- 12. Give yourself enough time to do a good job on your **homeworks**. Don't wait to the last minute.
- 13. Take notes during the films. If you have time, you may watch a film twice!
- 14. **Go** to the online discussion section. There will be opportunities to review the material and ask questions. You may also get to know other students there!
- 15. Go to the office hours of the IAs and/or the instructor. Office hours are a time to ask questions, or just ask for help or advice. It is also a time for you and your instructor or IA to get to know one another in an informal setting.
- 16. Go to the review sessions.
- 17. If you are having personal difficulties, do not hesitate to seek help at Counseling and Psychological Services (which is free to students). They can help you get over many types of hurdles. <u>http://caps.ucsd.edu/</u>

Their self-help library of resources covers many relevant topics, and can be accessed at http://caps.ucsd.edu/selfhelp.html

17. See the additional resources below for academic support, technical support, and student resources.

Academic integrity

Integrity of scholarship is essential for an academic community. The University expects that both students and faculty 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(s) to whom it is assigned, without unauthorized aid of any kind. Academic misconduct is defined as any prohibited and dishonest means to receive course credit, a higher grade, or avoid a lower grade. Academic misconduct misrepresents your knowledge and abilities, which undermines the instructor's ability to determine how well you're doing in the course.

All course materials are the property of the instructor, the course, and the University of California, San Diego and **may not** be posted online, submitted to private or public repositories, or distributed to unauthorized people outside of the course.

BILD 10 students are expected to do their own work, as outlined in the UCSD Policy on Academic Integrity. Because all homework/quizzes/exams are required for satisfactory completion of this

course, any student caught engaging in academic dishonesty may receive a failing grade for the course. He/she may also be suspended from UCSD. *Please* do not risk your future by cheating!

The Office of Academic Integrity has compiled a useful list of tips here:

https://academicintegrity.ucsd.edu/take-action/covid-19-students.html

In this course, we need to establish a set of shared values. Following are values* adopted from the <u>International Center for Academic Integrity</u>, which serve as the foundation for academic integrity.

	As students we will	As the teaching team we will
Honesty	 Honestly demonstrate your knowledge and abilities according to expectations listed in the syllabus or in relation to specific assignments and exams Communicate openly without using deception, including citing appropriate sources 	 Give you honest feedback on your demonstration of knowledge and abilities on assignments and exams Communicate openly and honestly about the expectations and standards of the course through the syllabus and in relation to assignments and exams
Responsibility	 Complete assignments on time and in full preparation for class Show up to class on time and be mentally and physically present Participate fully and contribute to team learning and activities 	 Give you timely feedback on your assignments and exams Show up to class on time and be mentally and physically present Create relevant assessments and class activities
Respect	 Speak openly with one another while respecting diverse viewpoints and perspectives Provide sufficient space for others to voice their ideas 	 Respect your perspectives even while we challenge you to think more deeply and critically Help facilitate respectful exchange of ideas
Fairness	 Contribute fully and equally to collaborative work, so that we are not freeloading off of others on our teams Not seek unfair advantage over fellow students in the course 	 Create fair assignments and exams and grade them in a fair and timely manner Treat all students and collaborative teams equally
Trustworthiness	 Not engage in personal affairs while on class time Be open and transparent about what we are doing in class Not distribute course materials to others in an unauthorized fashion 	 Be available to all students when we say we will be Follow through on our promises Not modify the expectations or standards without communicating with everyone in the course
Courage	 Say or do something when we see actions that undermine any of the above values Accept the consequences of upholding and protecting the above values 	 Say or do something when we see actions that undermine any of the above values Accept the consequences of upholding and protecting the above values

* This class statement of values is adapted with permission from Tricia Bertram Gallant Ph.D.

Accessibility

<u>http://disabilities.ucsd.edu</u> | <u>osd@ucsd.edu</u> | 858-534-4382 (UCSD campus contact) <u>https://biology.ucsd.edu/education/undergrad/osd.html</u> | <u>bioosd@ucsd.edu</u> (UCSD Biology)

Instructors are unable to provide accommodations unless they are <u>first authorized</u> by the Office for Students with Disabilities (OSD). Any student with a disability is welcome to contact me AND the Biology OSD liaison **early** in the course to work out reasonable accommodations to support their success in this course. Students requesting accommodations must first provide a current Authorization for Accommodation (AFA) letter issued by OSD. Receipt of the AFA by the biology liaison in advance is necessary for appropriate planning for the provision of reasonable accommodations. Arrangements for special exams require the student to coordinate together with the Biology OSD liaison.

For more information, contact the OSD at (858) 534-4382 (voice), <u>osd@ucsd.edu</u>, or visit <u>osd.ucsd.edu</u>

Inclusion

If you have feedback on how to make the class more inclusive, please get in touch! Office of Equity, Diversity, and Inclusion: 858.822.3542 | <u>diversity@ucsd.edu</u> | <u>https://diversity.ucsd.edu/</u> https://students.ucsd.edu/student-life/diversity/index.html

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, <u>https://ophd.ucsd.edu/</u>, or <u>http://ophd.ucsd.edu/report-bias/index.html</u>

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.

Technical support

UCSD Technical Support	Assistance with accounts, network, and technical issues (not MindTap)
Connect from Off-Campus	Help connecting to electronic library resources such as eReserves and e-journals
Computer labs	Find the locations of computer labs in different areas of campus.
Tech Lending Program	Circulates technology items to currently enrolled UCSD students to ensure that users have the technological means to complete coursework as efficiently as possible. TLP inventory consists mostly of frequently-requested items like device chargers, adapters (e.g., mini-HDMI to HDMI), flash drives, and headsets.
Technology Lending Request Form	Fill out this form for requests.
Tools for Remote Learning	Guidance on technology for students, including Zoom and Canvas , trouble-shooting and resources for internet access

Academic support

Geisel Library	Research tools and eReserves	
Content Tutoring with the Teaching + Learning Commons	Drop-in and online tutoring through the Academic Achievement Hub	
Supplemental Instruction with the Teaching + Learning Commons	Peer-assisted study sessions through the Academic Achievement Hub to improve success in historically challenging courses	
Writing Hub Services in the Teaching + Learning Commons	Improve writing skills and connect with a peer writing mentor	
Learning Strategies Tutoring	Address learning challenges with a metacognitive approach	
OASIS	Intellectual and personal development support	
Student Success Coaching Program	Peer mentor program that provides students with information, resources, and support in meeting their goals	

Personal support

Basic Needs	Provides access to food, housing, and financial resources	
Basic needs assistance forms	Assistance forms for a variety of services	
Financial Aid and Scholarships	Answers to questions about financial aid and scholarships. Virtual counseling is available.	
Financial Wellness	Access to emergency loans, appeals to increase financial aid, and financial literacy resources.	
Counseling and Psychological Services (CAPS)	Provides confidential counseling, consultations, and workshops for psychiatric services and mental health programming	
CAPS Crisis and Emergency Services	CAPS provides crisis and urgent counseling to students as well as emergency services.	
Community Centers	As part of the <u>Office of Equity, Diversity, and Inclusion</u> the campus community centers provide programs and resources for students and contribute toward the evolution of a socially just campus	
Office for Students with Disabilities	Documents students disabilities, provides accessibility resources, and reasonable accommodations	
Student Affairs Case Management Services Get help at (858) 246-1111	Triages and addresses student distress by ensuring that students are connected to appropriate resources. Inclusive, comprehensive support services that empower UCSD students to address all aspects of their health and well-being.	
CARE at the Sexual Assault Resource Center	Support for victims of sexual assault 858.534.5793	

Student resources

<u>Click here</u> for a video tour of student services and cultural centers across campus. This is a great place to start, for an excellent overview!

Subject to change policy

The information contained in the course syllabus, other than the grade and absence policies, may be – under certain circumstances (*e.g.* to enhance student learning) – subject to change with reasonable advance notice, as deemed appropriate by the instructor.

Tentative class schedule

on next page

Color codes:greenexamgoldguest speakerblueno in-person class this day

<mark>salmon</mark> holiday pink drop date

MONDAY	WEDNESDAY	FRIDAY	SATURDAY
		Sept 29 Introduction to BIMM 120	Sept 30 No homework
Oct 2 Introduction to microbes	Oct 4 Microbial Ecology	Oct 6 Microbes and History	Oct 7 Parasites in a Changing World
Oct 9 Microscopy	Oct 11 FIlm: What's Living in You?	Oct 13 Cell structure and function, Part 1	Oct 14 Introduction to Microbiomes
Oct 16 Cell structure and function, Part 2	Oct 18 Cell structure and function, Part 3	Oct 20 Guest speaker Dr. Timothy Rodwell Tuberculosis	Oct 21 No homework
Oct 23 MIDTERM 1	Oct 25 Growth and development 1	Oct 27 Growth and development 2	Oct 28 Microbial Biofilms
Oct 30 Control of microbial growth	Nov 1 Genomes	Nov 3 Gene expression	Nov 4 CRISPR-Cas Systems
Nov 6 TBA	Nov 8 FIlm: Human Nature	Nov 10 HOLIDAY	Nov 11 Antimicrobial Resistance
Nov 13 Protein secretion, Biotechnology	Nov 15 Molecular regulation	Nov 17 MIDTERM 2	Nov 18 No homework
Nov 20 Guest speaker Dr. Rob Knight Microbiota	Nov 22 Film: Hunting the Nightmare Bacteria	Nov 24 HOLIDAY	Nov 25 No homework
Nov 27 Bacterial lifestyles	Nov 29 Food & Industrial microbiology	Dec 1 Bacteriophage	Dec 2 The Phage Whisperer
Dec 4 Phage therapy	Dec 6 Medical microbiology	Dec 8 Medical microbiology	Dec 9 The Plague of Yersinia Pestis