BIMM 101 SPRING 2022

UNIVERSITY OF CALIFORNIA
SAN DIEGO

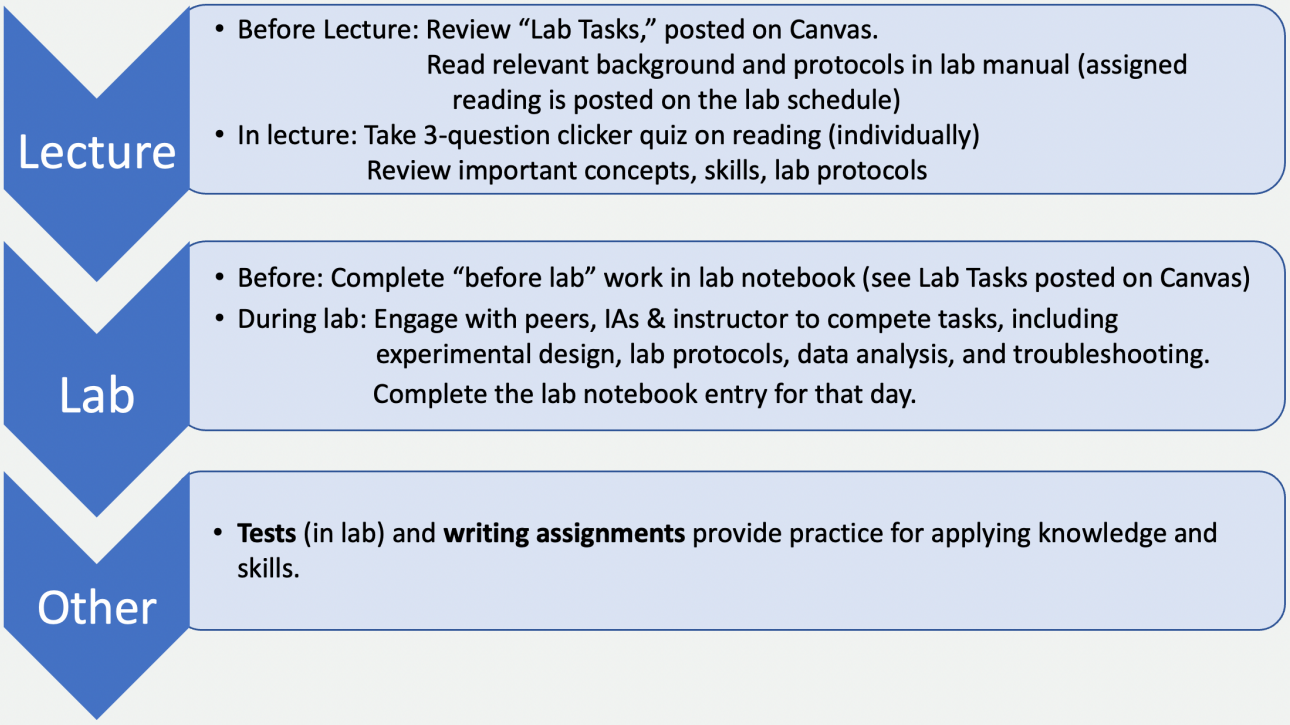
Instructor:
Dr. Cindy Gustafson-Brown cgb@ucsd.edu

Office Hours: Friday 2-3 PM. Location TBA. (starting April 8)
Also, please make use of time in the lab to talk (especially at the end)!

Instructional assistants:
Yuxi Wei yuwei@ucsd.edu Ryan Dang rdn009@ucsd.edu

Course site: https://canvas.ucsd.edu/

Course structure:



We will be sticking to the outlined plan as much as possible, but there may be times when the plan needs an adjustment. Any and all changes will be clearly communicated to the class. Adjust your settings in Canvas to ensure you receive notifications. Thank you for your patience!

In-person Lectures: Tuesday and Thursday 12:30-1:50 PM, Sequoia 148

Laboratory sessions: Tuesday and Thursday, 2:10-5:50 PM, York 4318 & 4332

(Note the delayed start time for lab, so we will have time to walk over from lecture in Sequoia)

Lab Schedule is on Canvas.

Lectures	will be delivered in-person and podcast. Masks must be worn in the classroom.
Lab sessions	will be in-person. KN95 masks or double-masks required in lab.
Tests/exams	will be in-person, in the lab.

Welcome to BIMM 101: Recombinant DNA Laboratory!

In BIMM101 we aim to develop an understanding of research in molecular biology through experimental design, critical analysis of data and literature, and experimentation. We will be spending most of our time working on a CRISPR-editing experiment.

LEARNING GOALS

- Apply knowledge of molecular biology concepts and lab techniques to plan experiments, explain and troubleshoot results
- Explain the importance of proper controls in designing experiments and interpreting results
- Perform basic lab math skills, statistical analysis, and graphing
- Conduct experiments using various recombinant DNA/molecular biology techniques
- Draw conclusions based on evidence and reasoning
- Use basic bioinformatics databases and applications
- Read, and evaluate primary literature
- Critically evaluate scientific writing
- Collaborate with one another to learn foundation biological concepts and laboratory skills

COURSE DESIGN

We assume you are here to learn. Just like athletic training for your body, learning requires **effort**. Readings in the lab manual lay the foundation for our lectures. Prior reading of the lab manual **before** lecture **is expected** in this class. Each lecture will start with a three-question clicker quiz on the reading. There may be additional, pre-class materials (relevant background information) assigned to enhance your understanding. There will also be one film which students are required to view.

We strive to create a **collaborative** environment in this course, in which students work together in a constructive way. To encourage collaboration, grades will not be assigned on a curve. You are not in competition with your classmates, and you may ALL succeed!

Actively asking and answering questions and participating in discussions with classmates, the IAs, and the instructor is encouraged. Being able to communicate both understanding *and* confusion is critical to success in any discipline, and is useful for learning.* Confused? Ask questions! If you understand, help your classmates! Students are expected be active learners! Take charge of your own success!

*Smith et al., 2009. http://www.sciencemag.org/content/323/5910/122.short

Tests and assignments will include questions that are based on solving problems in new contexts, analyzing and interpreting data to draw conclusions, and critiquing claims.

LAB SAFETY

Safety precautions are crucial in the laboratory setting. Appropriate laboratory attire and personal protective equipment (PPE) are required. There is no eating or drinking allowed in the lab.

Enrolled students MUST successfully complete the Biology Lab Safety Training & Assessment **before** the second lab session (March 31): https://biolabclass-safetyquiz.ucsd.edu/introduction

Please note that courses offered by other departments (Chemistry, for example) may have additional safety training requirements.

ABSENCES AND LATE POLICY

Attendance in **lecture** is strongly recommended. It is highly unusual for a student to get an A or B in the course without attending lecture. Furthermore, critical information is presented in lecture regarding the next day's experiments. If you miss lecture you are likely to be behind the curve in knowing what to do when you get to lab. Finally, there will be a daily reading quiz in lecture, plus additional clicker points that you may earn if you participate in answering questions during lecture.

Attendance is mandatory for ALL **labs** (Tues/Thurs). There are no make-up labs and you cannot attend an alternate section. The experiments are designed for groups of 2-4 students and your absence would increase the workload on your partners. If there is a genuine emergency or health issue, you should contact your instructor (Dr. Gus) AND your IA by email PRIOR to the start of the lab you will miss. We can generally work around those problems. However, absences due to scheduling conflicts will not be excused. You need to work out those conflicts before the quarter begins.

The first unexcused absence will carry a 75-point penalty from the total for your grade. (There are 1000 points in the quarter.) If there is a second unexcused absence, you will be asked to drop the class or receive an F in the course. If you anticipate multiple absences this quarter, I suggest you withdraw from the course and enroll during a later quarter when you are available to attend all labs.

Tardiness in the lab will impact your grade. You will miss important announcements and instructions. You may miss a quiz. And it puts an undue burden on your partner. If you are late more than once, you may be asked to drop the course.

WHAT TO BRING TO THE LECTURE

- an iClicker (registered on Canvas, see “iClicker Registration” on left side of home page)

WHAT TO BRING TO THE LAB

1. **Lab coat**: All students need to bring a long lab coat (roughly to the knees, not the short hip length version).
2. **Eye protection**: All students need to bring UV-blocking goggles or safety glasses. These are required even if you wear prescription eye glasses. It is strongly recommended that you do not use contact lenses while working in the lab. The bookstore has **anti-fog** safety glasses that fit over regular glasses. They also are selling an anti-fog solution for $4. Pyramex™ S2510ST anti-fog glasses are available online and are recommended for their anti-fog properties.
3. **Masks** are required. You must provide your own masks. You may use one of the following configurations
    a. KN95 respirator mask
    b. a non-KN95 disposable mask under a cloth mask (double masks)
4. Anyone with long hair (male or female) needs to wear or bring a **hair tie** to lab (and USE IT).
5. Wear **closed-toed, closed-heeled shoes**. Sandals, flip-flops, or any other open footwear are not permitted in the lab. If you show up wearing inappropriate footwear, you will be turned away.
6. **Long pants**, not leggings. Tight or cropped pants are not allowed. Shorts are not allowed.
7. **Permanent markers** (Sharpies), preferably fine point rather than thick. Do not get the ultrafine as they do not work well in the lab. You will need these for marking on your media plates and tubes. Black or blue are preferred. Avoid red or any light color (however pretty).
8. **Bound, lab notebook** with carbon copies. You may use the remaining pages in an old lab notebook if: a. there are pages available at the front for a table of contents
    b. there are plenty of pages at the back for our experiments
9. **Lab manual** – "BIMM 101 Recombinant DNA Lab Manual" is available at the UCSD Bookstore
10. **Laptop computer** – is not required, but is often helpful

COMPUTERS

We will often use computers for data analysis and other exercises. We have access to a few computers in the lab, however if you have your own laptop computer it is recommended you bring it to lab.

GRADING

The following grading distribution will be used. The course is **not** graded on a curve. Thus, your ability to do well in this course is not dependent on others doing poorly.

A = 88% - 100%
B = 77% - 87.9%
C = 66% - 76.9%
D = 57% - 65.9%
F = below 57%

There will be pluses and minuses assigned.

Components of the grade	Percent
1. reading quizzes (start of each lecture, two dropped)	5%
2. clicker questions (participation, after the reading quiz)	5%
3. miscellaneous homework	3%
4. eight lab notebook submissions (lowest dropped)	13%
5. five lab quizzes (lowest dropped)	24%
6. CRISPR write-up	20%
7. TAS2R38/PTC Assignment	5%
8. Lab skills and professionalism	5%
9. Comprehensive exam	20%

1. Reading quizzes: For each lab, there is a reading assignment indicated in the lab schedule. This should be read *prior to the lecture*. On most lecture days, if there has been a reading assignments, there will be a three-question clicker quiz at the start of lecture. You will recognize these questions, because there will be an orange box around the slide. The two lowest scores will be dropped. Of the remaining scores, if you correctly answer 80% of the questions over the quarter, you will receive the full credit (100% of the points). These reading quizzes are cumulatively worth 5% of the final grade.

Clicker scores will not be posted on Canvas. The answers to the quiz questions (orange box questions) are announced during lecture, which is podcast. If you want to keep track of your performance on quiz questions, keep a record of your answers in your notes. The slides are posted after each lecture on Canvas.

These quizzes are a good chance for you to notice if you are confused on certain topics or protocols. **Please follow-up on things you are confused about! Ask questions in class or lab, come to office hours!**

2. Clicker questions: These are questions that come after the three-question quiz, during the lecture. You will recognize these questions, because there will be an green box around the slide. In order to receive these points each day, you must respond to 80% of the questions in that lecture. It does NOT matter if your answer is correct; credit is based on participation.

Everyone gets two free absences. If your battery fails or you forget your clicker, you will use one of your free absences. We don't have to negotiate credit; you can still get all the participation points from the remaining days you click in.

Clicker scores will not be posted on Canvas. You may also keep track of your responses to the green box questions and compare them to the total number of questions asked. Again, you will find the questions among the slides on posted on Canvas.

You may NOT share a clicker with another student. If you are found to be using another student's clicker, or if another student is using your clicker, you will receive a failing grade in the class, and will be referred to the Office of Academic Integrity for administrative discipline.

3. Miscellaneous homework: During the quarter there will be a number of small assignments/tasks that we will ask you to submit. They fall under this category and account for 3% of your grade.

4. Lab notebooks: Keeping a thorough and organized lab notebook is an essential skill for any lab researcher. One of our goals is to help you develop good habits in keeping a notebook. In this lab, we will use a hard-copy notebook, rather than online notebooks. Please consult the lab manual for what we expect in the lab notebooks. Dr. Gus will review how to keep a good notebook in lecture 2.

On eight days (to be announced), students will tear out the carbons, staple them, and submit them to the IA for grading. Assessment of the lab notebooks will include

- pre-lab work: purpose, summaries, predictions, etc
- in-lab work: calculations, observations, data analysis
- drawing conclusions in the form of an argument
    - claims
    - data to support claims
    - explanations providing a biological or procedural mechanism
    - troubleshooting when necessary

The lab notebook submissions are cumulatively worth 13% of the final grade. The lowest notebook score will be dropped.

5. Lab quizzes: There will be five in-person quizzes in the lab (see lab schedule). These quizzes are cumulatively worth 24% of the final grade. Quizzes will be cumulative (lectures, reading, experiments) but will focus on the more recent material. They also will include the reading and lecture for THAT day's experiments. Study guides will be posted on Canvas. The lowest lab quiz score will be dropped.

6. CRISPR Write-up:
This assignment is to write a short scientific article to present results of the CRISPR experiment, including

- introduction
- methods summary
- results
- scientific arguments
    - what you can conclude
    - evidence to support your argument
    - reasoning biological/molecular/experimental explanations or hypotheses

A draft will be submitted for peer-review, and then a final version. Guidelines will be provided on Canvas. It is worth 20% of your grade.

7. TAS2R38/PTC Assignment: Students will analyze data and answer questions about the analysis. The assignment will be posted on Canvas. It is worth 5% of your grade.

8. Lab skills and Professionalism: All students are expected to be good lab citizens. Your attitude, cooperation with others, conscientiousness, work ethic, technique and skill in the lab will contribute 5% of your grade.

Lab skills portion will be based on the following criteria:

a. PRE-LAB PREPARATION
b. PRE-LAB PREPARATION
c. PRE-LAB PREPARATION
d. Technical skill and careful management of lab procedures (*e.g.* success of experimental procedures, judicious use of reagents, proper waste disposal, etc.)
e. Taking care of university property (consistently locking your locker, etc.)
f. Caliber of thinking before asking questions
g. Scientific approach (*e.g.* controls, experimental design, powers of observation)
h. Accuracy
i. Safety consciousness
j. Organization and general neatness in lab

The **professionalism** portion of the grade is intended to motivate students to consider the impact of their actions on their own learning and the learning of others in the course. Unprofessional interactions consume time yet have no meaningful benefits to you, your fellow students, and/or the teaching team. Analogously in the workplace, being unprofessional to your colleagues or supervisors will only discount you. When you are discounted, you will not be invited for new opportunities that you may or may not be aware of.

During the quarter, the teaching team will make observations which will contribute to the professionalism component of your grade, including but not limited to one-on-one interactions, electronic communication, contributions to class data sets according to deadlines, and follow-up conversations on grades. The following will be considered:

a. Paying attention during instructions
b. Independence and initiative
c. Ability to adapt to unforeseen procedural changes
d. Being responsive to correction
e. Being respectful toward others (classmates, IA, instructor)
f. Meaningful contribution to your group and cooperation with classmates
g. Integrity

Example interactions that have no meaningful benefits and thus should be avoided:

- Contributing inequitably to team work
- Harassing and/or bullying the instructional team or other students, either in person or online

- Repeatedly asking questions when the information is already available
- Ignoring the directions or requests from the instructional team

9. Comprehensive Exam: The comprehensive exam will synthesize concepts and skills from the entire course, and takes place in-person, during the last lab period.

LATE ASSIGNMENTS AND SUBMISSIONS

Assignments must be handed in **at the START** of lecture/lab on the due date. Assignments must be submitted on time (within 10 minutes) to be eligible for full credit. Except in the case of health or family emergencies, late assignments will be subjected to a 25% deduction per day if submitted within 48 hours after the posted due date. Assignments not submitted within 48 hours of the due date will receive a score of zero.

In addition to the hard copy, you are required to submit an electronic copy of homework to Turnitin.com, by the due date/time. A link to the e-submission website will be provided on CANVAS. There is a penalty for late online submissions. Failure to submit to Turnitin.com will result in zero points.

By taking this course, students agree that their assignments will be subject to review for textual similarity by Turnitin for the detection of plagiarism. All submitted assignments will be included as source documents in the Turnitin reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin service is subject to the terms of use agreement posted on the Turnitin site.

REGRADES

Please see the regrade policy on Canvas.

ACADEMIC INTEGRITY

https://students.ucsd.edu/academics/academic-integrity/index.html

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.

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 broadly 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.

In this course you will often be doing experiments and collecting data with a group, and I encourage you to discuss and share thinking. It is important to get feedback on your ideas and work, but you are still responsible for producing your own work, in your own words, from your

own effort. You must hand in your own assignments, *written in your own words.* **Copying someone else's lab report or homework is cheating. Showing your homework to someone else is likewise cheating.**

Any suspected instances of a breach of academic integrity will be reported to the Academic Integrity Office for review. Depending on the severity of the case, penalties will be imposed that may include a failing grade in the course. Please do not risk your future by cheating.

In this course, we need to establish a set of shared values. Following are values* adopted from the International Center for Academic Integrity, 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.*

Student Resources for Support and Learning

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

TECHNICAL SUPPORT

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

STUDENT RESOURCES

Basic Needs	Provides access to food, housing, and financial resources
Counseling and Psychological Services (CAPS)	Provides confidential counseling and consultations for psychiatric services and mental health programming
Community Centers	As part of the Office of Equity, Diversity, and Inclusion 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
Triton Concern Line	Report students of concern at (858) 246-1111
CARE at the Sexual Assault Resource Center	Support for victims of sexual assault 858.534.5793

ACCESSIBILITY

http://disabilities.ucsd.edu | osd@ucsd.edu | 858-534-4382
Any student with a disability is welcome to contact me early in the quarter to work out reasonable accommodations to support their success in this course. Students requesting accommodations should provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD), prior to eligibility for requests. Receipt of AFAs in advance is necessary for appropriate planning for the provision of reasonable accommodations. Instructors will receive Authorization for Accommodations Letters from the OSD online portal. Instructors are unable to provide accommodations unless they are first authorized by OSD. For more information, contact the OSD at (858) 534-4382 (voice), **osd@ucsd.edu**, or visit **osd.ucsd.edu**

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 | diversity@ucsd.edu | https://diversity.ucsd.edu/
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, https://ophd.ucsd.edu/ , or http://ophd.ucsd.edu/report-bias/index.html

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.

CARE at the Sexual Assault Resource Center: 858.534.5793 | sarc@ucsd.edu | https://care.ucsd.edu
Counseling and Psychological Services (CAPS): 858.534.3755 | https://caps.ucsd.edu

LETTERS OF RECOMMENDATION

If you think you may want me to write you a letter of recommendation (or any other instructor), please consider what a good letter would contain and how your actions in the course demonstrate the qualities you will want highlighted in a good letter. When students ask me for a letter of recommendation, I ask them to write to me about how they demonstrated critical thinking, leadership, collaboration, and professionalism. I will be specifically looking for examples of these qualities *that I could have noticed* during lab and office hours. Be sure to actively participate in the labs and discussion groups, and talk to me in my office hours: ask questions, offer your own ideas and interpretations of your results, bring interesting facts/papers that are connected to the material we are studying. If you don't actively show the qualities that are needed to earn a good letter, it will be hard for me to write a letter that is meaningful and useful.

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.