

BIMM 101 SPRING 2020

UNIVERSITY OF CALIFORNIA
SAN DIEGO

Instructor:

Dr. Keefe Reuther (he/him/his) kdreuther@ucsd.edu

I will only send and receive correspondence via my UCSD email address or the course Canvas site.

All educational sessions except office hours will be recorded and made available asynchronously.

Office Hours: Thursday, 8:00am-9:15am. Also, time to talk in lab. Office hours are by Zoom. See link on Canvas. Also please use the discussion board on Canvas to ask and respond to questions.

Instructional assistants:

E01 Michelle Bui mpbui@ucsd.edu

E02 Jinhao Xu jix254@ucsd.edu

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

Course structure:

Class

Complete *before* lab session

- **Pre-Lecture videos:** introduce important concepts, goals for lab session
- *Post-lecture quiz on Canvas to reinforce some key concepts/skills, due before lab session*

Lab

Digital lab notebooks will be assigned to you, this is where your work will go before and during each lab session.

- **Before:** Draw protocol for the day to visualize lab tasks and goals. Insert this drawing into lab notebook.
- **During:** Engage with peers, IA, and Instructor in small group discussions via Zoom to analyze data, design experiments, discuss results.
- Ask IA and instructor questions
- **By end of lab day:** Summarize analysis or design for that day in your lab notebook. If data has been analyzed, this should be a summary of the data, what claims (conclusions) you can make, and an explanation of the molecular biology/procedural reasons that led to these results. If results were unexpected, including troubleshooting ideas. See guiding questions in the lab manual.

Other tasks

- Three take-home tests during the quarter to apply knowledge and skills learned
- Scientific report of CRISPR-Cas9 editing results (mini journal article, also includes submitting a draft and peer-review)
- Summarize and present another recombinant DNA technique (end of quarter)

Video Lectures: Will be available on Canvas site – weekly lectures will be posted Sunday night for the following week.

Laboratory sessions: Tuesdays and Thursdays from 9:30am-11:30am (PST), connect using Zoom web conferencing (Zoom link on Canvas site)
Course Schedule: Posted on Canvas.

Welcome to BIMM 101: Recombinant DNA Laboratory! In BIMM101 we aim to develop an understanding of research in molecular biology through inquiry-based sessions. We will work in groups to design, collect, analyze, and critique data while learning molecular and biological concepts and critical thinking skills.

LEARNING GOALS

- Apply knowledge of molecular biology concepts and molecular 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
- Draw conclusions based on evidence and reasoning
- Use basic bioinformatics databases and applications
- Find, read, and evaluate primary literature
- Critically evaluate scientific writing (your own, and that of peers)
- Collaborate with one another to learn foundation biological concepts and laboratory skills

MAJOR COMPONENTS

- Class: Learn biological concepts and about the techniques related to the research projects
- Laboratory: Engage in collaboration to learn and analyze data
- Out-of-class: Reading, planning, online quizzes, assignments, reports

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 for this course due to a disability must work through the Office for Students with Disabilities (OSD). Instructors will receive Authorization for Accommodations Letters from the OSD online portal. Whenever possible, we will use universal designs that are inclusive. If you have feedback on how to make the class more accessible, please get in touch!

INCLUSION

It is our goal to create a learning environment that supports diversity of thought, perspective, experience, and identities. We encourage all of you to participate in discussion and contribute to the field from your perspective. 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>

<https://regents.universityofcalifornia.edu/governance/policies/4400.html>

LEARNING IN THIS COURSE

This course is designed to be an environment for everyone to learn and construct a shared understanding of the material. **Active participation** by engaging with the lecture material, asking and answering questions (e.g. on the discussion board), and contributing to breakout sessions during lab time is expected. Being able to communicate understanding, and confusion, is critical to

success in any discipline, and is very useful for learning¹. To encourage collaboration, lab

Lab

discussions will be done in groups, and grades will not be assigned on a curve. Being proactive to ask questions during office hours and on the discussion board will be critical for success, especially given the online nature of the course.

Instead of memorization, we will focus on developing an understanding of fundamental concepts as they apply to different examples. Therefore, quizzes will include questions that are based on solving problems in new contexts.

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

GRADING

BIMM101 has multiple grading components:

Post-lecture quizzes (drop 2 lowest scores)		10%
Lab discussions	8%	
Lab notebooks	25%	
Molecular Biology Review Quiz		2%
Take-home quizzes (drop lowest score)		18%
CRISPR write-up	18%	
Technique Report & Presentation		15%
Professionalism	4%	
Extra credit (e.g. surveys)	1%	

The following grading scheme will be used. The course is **not** graded on a curve (i.e. 20% of students getting A, B, C, and such). Thus, the ability to do well in this course is not dependent on others doing poorly.

95-100	A+
91-94	A
87-90	A-
83-86	B+
79-82	B
75-78	B-
71-74	C+
67-80	C
63-66	C-
55-62	D
0-54	F

Post-lecture quizzes: The quizzes posted on Canvas are meant to reinforce important concepts covered in the video lectures. Quizzes are to be completed *prior* to the start of the lab (deadlines will be posted on Canvas). **It is very important to follow-up in office hours or via discussion boards on concepts you were unclear on.**

Lab discussions: Links to join the video lab sessions will be provided on Canvas. Discussions will be facilitated by the instructional assistants and instructor and are meant to be a time to work collaboratively to analyze data, design experiments, and engage in troubleshooting of results. Participation in at least 85% of the lab sessions will result in full points. **It is highly recommended that you participate in as many as possible because this is an opportunity to ask questions and get feedback.** *If circumstances beyond your control interfere with your ability to participate, please get in touch with me so we can devise a plan for you to succeed in the course.*

Lab notebooks: Each student will be assigned an individual digital lab notebook (Google Doc) that you will use for the quarter. These will be made available through the Canvas Site. Complete and

organized lab notebook entries are a critical part of effective work in a research lab. As such, we expect students to practice good lab notebook entry habits. Please consult the lab manual for what we expect in the lab notebooks, and use the template provided in the Google Doc. **Lab notebook entries will be regularly checked** and scored for various components: pre-lab work which often includes a summaries and predictions, in-lab work such as data analysis and discussion of data, and drawing conclusions in the form of an argument: claims, data to support claims, and explanations in the form of a biological or procedural mechanism, troubleshooting results when necessary. A grading rubric will be provided on Canvas.

Molecular Biology Review Quiz: A quiz about some background molecular biology and experimental design concepts will be due before the Thursday lab of Week 2. Quizzes will be scored for 1 point for completion, and 1 point for correctness (85% correct gets full correctness points). Instructions to take and submit the quiz will be posted on Canvas.

Take-home quizzes: Quizzes will be released on Thursday mornings and due the following Sunday at 11:59pm (see calendar on Canvas). Quizzes will be uploaded to GradeScope by the student (instructions provided on Canvas). Quizzes will be cumulative but will focus on the most recent material. There will be 4 quizzes, with the lowest score being dropped.

CRISPR Write-up: Guidelines, rubrics, and due dates for the write-up and assignments will be posted on Canvas. The goal of the write-up is to practice presenting and summarizing results, as well as constructing scientific arguments (what you can conclude, evidence to support, and providing reasoning biological/molecular/experimental explanations or hypotheses) in the form of a short journal article. A draft will be submitted for peer-review, and then a final version. Check course schedule on Canvas for due-dates.

Technique Report & Presentation: Toward the end of the course everyone will choose a recombinant DNA/molecular biology technique to research, summarize, and present. The purpose is to explore other techniques that are typically used in molecular biology research, understand how the technique works and can be used, and communicate your understanding in the form of a short-written report and an oral presentation (delivered by video conferencing). Rubrics and guidelines will be posted on the course site.

Professionalism: This portion of the course 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. Professionalism can be demonstrated through individually demonstrating maturity and professionalism, as well as contributing meaningfully to our lab community (1 point described here). By default, every student is assumed to be professionally mature. Hence, this component is awarded to every student at the beginning of the quarter. During the quarter, based on observations by the teaching team, which includes but is not limited to one-on-one interactions, electronic communication, contributing data to class data sets according to deadlines, and follow-up conversations on grades, your professionalism credit may be deducted.

Example interactions with meaningful benefits:

- Developing deeper insight into course material, concepts, biology, and/or society in general
- Working collaboratively to improve in skill building and future opportunities
- Contributing to an inclusive learning environment
- Learning conceptually and meaningfully why full credit was not awarded for an assignment
- Clarifying course material that facilitates deeper learning
- Reporting errors or problems in class, on assignments, or for other course material
- Arriving on-time to lab video sessions and being prepared to work in lab

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
- Asking questions when the information is already available or will eventually be known
- Ignoring the directions or requests from the instructional team

Extra Credit: The 1% extra credit can be earned by completing course evaluations and related surveys which aim to improve the course and the educational experiences of your future peers. There are no other opportunities for extra credit beyond what is assigned by the course instructor.

LATE ASSIGNMENTS AND QUIZZES

Assignments must be submitted on time to be eligible for full credit. Except in the case of medical or family emergencies, late assignments will be subjected to a 10% 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 0.

REGRADES

If a grading error has been made, you should submit a re-grade request to your Instructional Assistant or Dr. Reuther. Students who submit items for re-grading understand that we may re-grade the entire item and the score may go up or down.

ACADEMIC INTEGRITY

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

Students are expected to do their own work, as outlined in the UCSD Policy on Academic Integrity. 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. Please do not risk your future by cheating.

Students suspected of AI violations on exams will be invited to Zoom follow-up meetings where they will be asked to (in real time, on video) justify their answers (before the graded exams or solutions are released). If the instructor isn't convinced during the meeting, or the student refuses to participate, they're submitted for AI violations.

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. 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	<ul style="list-style-type: none"> ● 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 	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● 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 	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● Speak openly with one another while respecting diverse viewpoints and perspectives ● Provide sufficient space for others to voice their ideas 	<ul style="list-style-type: none"> ● Respect your perspectives even while we challenge you to think more deeply and critically ● Help facilitate respectful exchange of ideas
Fairness	<ul style="list-style-type: none"> ● Contribute fully and equally to collaborative work, so that we are not freeloading off of others on our teams 	<ul style="list-style-type: none"> ● Create fair assignments and exams and grade them in a fair and timely manner

	<ul style="list-style-type: none"> ● Not seek unfair advantage over fellow students in the course 	<ul style="list-style-type: none"> ● Treat all students and collaborative teams equally
Trustworthiness	<ul style="list-style-type: none"> ● Not engage in personal affairs while on class time ● Be open and transparent about what we are doing in class <p>Not distribute course materials to others in an unauthorized fashion</p>	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● 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 	<ul style="list-style-type: none"> ● 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.*

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. Any suspected instances of a breach of academic integrity will be reported to the Academic Integrity Office for review and possibly given a score of 0.

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
Academic Integrity	Policy on Academic Integrity of Scholarship and strategies to excel with integrity
Technical Support	Assistance with accounts, network, and technical issues

STUDENT RESOURCES

Basic Needs	Provides access to food, housing, and
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	financial resources
Counseling and Psychological Services (CAPS)	Provides services like 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
Counseling and Psychological Services	Individual, group, couples, and family psychotherapy services for registered undergraduate and graduate students
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

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>

CHILDREN and video sessions

You are welcome to have children with you during video sessions as I fully understand that childcare situations may be complicated for many of us at this time. Do your best to participate and engage, but also please get in touch with me if you have any questions or concerns.

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 discussions, talk to me during the lab and 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 write 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.

TECHNICAL SUPPORT

For help with accounts, network, and technical issues: <https://acms.ucsd.edu/contact/index.html>

For help connecting to electronic library resources such as eReserves and e-journals:

<https://library.ucsd.edu/computing-and-technology/connect-from-off-campus/>

© 2020 Reuther, UC San Diego do not copy or distribute without permission. This syllabus is subject to change, particularly because of campus efforts to contain covid-19. Any schedule changes will be posted on the course website. Make sure to frequently check the website to keep updated.