

BIMM100 (Molecular Biology) SYLLABUS

Fall 2022, 4 units

Instructor: JOSE PRUNEDA-PAZ

Office: Muir Biology Building #3214.

E-mail: jprunedapaz@ucsd.edu (please use the subject line: 'BIMM100'). Note that emails will be generally answered by 8PM every day.

Phone: 858-534-8323 (please identify yourself as a student in BIMM100)

Office hours: Thursdays 3-4 PM at Muir Biology Building #1102

Extra OH on Friday Oct 21 and Dec 2, 2-3:30 PM at Muir Biology Building #1102

Class website: <https://canvas.ucsd.edu>

Lectures: Tuesdays & Thursdays 12:30-1:50 PM at Galbraith Hall #242 (podcasted)

Class and discussion section schedules: provided in separate files in the course website

Exams: MIDTERM (online), Tuesday, Oct 25 (12:30 - 1:50 PM, US Pacific Time)

FINAL EXAM (online), Friday, Dec 9 (11:30 AM - 2:29 PM, US Pacific time)

Instructional Assistants (IA):

Name	e-mail	Office hour date (US Pac Time)
Rey Bedon, Camilo	creybedo@ucsd.edu	
Yang, Emily	yoy004@ucsd.edu	
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Important dates:

Sep 26: IA office hours start

Sep 29: Professor office hours start

Oct 3: Discussion sections start (dates, times and locations in course website)

Oct 4: iClicker participation starts being monitored (register iClicker before this day)

Oct 25: Midterm exam

Nov 22: online lecture (via Zoom)

Dec 9: Final exam

Other important dates must be confirmed at:

<https://blink.ucsd.edu/instructors/courses/enrollment/calendars/2022.html>.

Rules for in person classes:

- 1) **Everyone must wear a mask. The campus recommends the use of N-95 and KN-95 masks** (a face covering/face mask DOES NOT include a scarf, ski mask, balaclava, bandana, gaiter, turtleneck, collar, plastic face shield, or single layer of fabric). Free masks available [here](#).
- 2) **Everyone must be fully vaccinated and boosted against COVID-19**, or have an approved exception or deferral, [per University of California policy](#). Requests for exceptions or deferral should be submitted as soon as possible so you do not risk non-compliance with the policy. [Make a free vaccination appointment](#).
- 3) These University guidelines may be updated during the quarter. You can find up to date regulations as well as additional information and resources at: <https://returntolearn.ucsd.edu/return-to-campus/campus-repopulation/index.html>

Course Prerequisites:

Prerequisites:

BILD 1 and,
BIBC 103 or BILD 4 or BIMM 101 and,
Chem 40A or Chem 40AH or BENG 120 and,
Chem 40B or Chem 40BH or BENG 120

If you feel rusty on the material of the prerequisites, it is strongly recommended that you carefully read Chapters 1-3 and Chapter 5 (pp171-182) of the *Lodish* textbook (7th ed) or Chapters 1-3 and Chapter 6 (pp223-234) of the *Lodish* textbook (8th ed), which cover material that is considered prerequisite and will only be mentioned in passing during class.

Purpose of the course: Molecular Biology is the study of gene structure, function and regulation at the molecular level. It describes fundamental mechanisms, shaped by evolution, that underlie all known life on our planet - mechanisms that when impaired, for example by mutation or by parasitic interference, lead to human disease. You will be introduced to our current understanding of genome structure and gene expression and the key experimental observations and deductions made by scientists, which have shaped, and continues to shape, our knowledge in this rapidly developing field of biology. As you will learn, this is a field of intense research with new exciting discoveries reported daily.

Learning objectives: After taking this class, you should know the key concepts of the central dogma of molecular biology, including the composition of genomes and the basic mechanisms of replication, transcription, RNA processing, translation and RNA turnover, and how the complexes that perform these activities identify their targets, carry out their function and can be regulated to meet cellular needs. In addition, you should have a basic understanding of the experimental approaches and deductions that have shaped, and continues to shape, our understanding of these concepts. Doing well in this class requires solid prior understanding of BILD1, biochemistry and organic chemistry.

COURSE STRUCTURE:

BIMM100 is a large class with more than 300 students, which all have different ways of learning. In an attempt to teach to all students, the course is structured in a way that offers multiple learning tools. These include:

Lectures: Lectures will cover the central topics of molecular biology in the order indicated in the schedule, although the specific order can deviate a bit from that indicated, depending on time. The order of the topics discussed during lectures is different from the order in the textbook. This is done purposefully to allow the lectures to follow the general order of the central dogma of biology (DNA->RNA->Protein). We will therefore first discuss the composition and structure of DNA, mechanisms of DNA replication and repair, the composition of genomes, the use of recombinant DNA in research, transcription, RNA processing, mRNA translation and turnover. Along the way, we will discuss key experiments and deductions that underlie the understanding of the different processes. The pages in the textbook corresponding to the material discussed during lectures are indicated in the class schedule.

On the day before each lecture (at the latest), **a copy of the lecture slides (in pdf format) will be uploaded to the course website**. It is highly recommended that you download and print out the lecture slides so that you can follow the lecture by taking notes on them. They comprise a skeletal record of what happens in the lecture. However, you may find the lecture slides unintelligible without your own written notes. Therefore, don't think of them as a second, independent "book" you can read but instead as a collaborative record of the lecture that you will create. Most lectures start with a brief (5-10 minute) overview of the material discussed in the previous class. This is meant to remind students of the most important concepts discussed as we move along, and should present an excellent opportunity for students to take notes.

Lectures will be in person (except during thanksgiving week)
Audio/video podcast for each lecture will be available at [Podcast.ucsd.edu](https://podcast.ucsd.edu)

Textbook: Lodish et al. 'Molecular Cell Biology' 7th (2012) / 8th edition (2016) / 9th edition (2021), Freeman, is optional, but highly recommended. The textbook will give you another view of the material taught in lecture. However, **note that topics covered in lecture are the materials you will be tested on, thus use lecture slides to guide your book reading.**

iClickers: will be used for rapid feedback to foster interactive learning in a large classroom setting. Clicker questions (usually 3-6 per class) will be used during class time to make students think about, and discuss with each other, how the newly discussed material fit within the bigger picture of molecular biology, and how experimental observation and experimental design can address questions in molecular biology.

Note that there will be extra credit points for clicker usage (see below).

New and used iClickers are available at the Price Center bookstore. Make sure to get an iClicker and not a different system (iClickers 1, 2 and + are okay).
For more information, visit: <https://clickers.ucsd.edu/>

Assignments: will be used as a tool for *active learning*, which is an instructional approach used to engage students in the lecture topics through *problem-solving* activities. Working in groups through these activities is strongly recommended. It is important that you keep in mind that you will have the greatest learning benefits if you attempt to solve problems on your own (or with a small group of students) before seeking for IA help during discussion sections.

Assignments will be posted on the class website on most Thursdays during the quarter (see the class schedule for specific dates). An answer key for each assignment will be posted on the course website by the end of the discussion section week.

Discussion sections: will provide another opportunity for *active learning* through *peer-mentored* review sessions of assignment problems. During discussion sections, IAs will identify assignment problems that pose difficulties for most students and will moderate a discussion between students to figure out the right answer. Thus, it is important that you work on the assignments before attending a discussion section. Keep in mind that it will not be possible to look at all assignment problems during the discussion section.

Discussion sections will be held in person once a week, most weeks of the quarter (schedule and locations are available in the course website).

Each IA will lead one or two discussion sections (indicated in discussion section schedule).

Discussion sections are meant to have only a limited number of students so you should attend to the section that you are enrolled in. However, you could attend to a discussion section that you are not enrolled in if : 1) you switch spots with another student, or 2) you fill the spot of an absent student in any given discussion section.

Note that there will be extra credit points for discussion section attendance (see below).

Discussion forum (in course website): we will be using Piazza to provide a virtual space for organized discussions on academic and non-academic class topics. This will give you an additional tool to address specific questions.

Note that the professor and IAs will supervise each forum daily, so students are welcome not only to ask questions but also to provide answers to posted questions.

Please, keep in mind that only short answers could be provided in the discussion forum. If you need a detailed explanation of any given topic you should use the professor or IA office hours.

Office hours (professor and IAs): will provide an additional option to discuss the material being presented in class, assignments or other related interests you may have. Course-related discussions include asking for extra help, seeking clarification of material presented in class and following up on aspects of the class you find compelling. The instructor will not have lessons planned for office hours. It is expected for students to drive these meetings with their questions and thoughts.

A good way to prepare for office hours is to review the material and your notes from class and identify as clearly as you can what you do not understand.

Office hour dates/times/locations are indicated in the first page of this Syllabus (for online office hours, meeting links are available in the “Zoom” folder that you will find in the course website).

COURSE EVALUATION:

Exams: Your grade in BIMM100 will be based entirely on the cumulative score of two exams, midterm and final, as indicated below:

Midterm (40% of final score): The midterm exam will be during class time (see schedule in course website). It will be closed book and will cover the material discussed in lecture and

assignments between weeks 0-4 (see schedule and assignments in course website).

Final Exam (60% of final score): The final exam will be given in finals week (see class schedule). It is closed book and will cover the concepts on the specific material covered in lecture and assignments after the midterm.

Exam format:

Exams will be taken online in Canvas and will be proctored via Zoom (see online exam guidelines below).

For that you'll need to have a computer with internet access/camera. If you need a computer, you can request a loaner from UCSD. The link for the Student Loaner Laptop Request Form is: <https://eforms.ucsd.edu/view.php?id=490887>. For any questions regarding the Laptop Loaner Program please direct them to the following email: vcsa@ucsd.edu (application deadline is Oct 17, 2022).

Note that while you will be able to take the exams from any place (campus Zoom locations can be found here: <https://vcsa.ucsd.edu/news/covid-19/#Campus-Zoom-Spaces>), the assigned exam locations will be available in case you need them (GH242 for midterm and TBA for final).

Exam questions will be mostly in the short answer format (some could be multiple choice).

There will be no scheduled make-up exams for the midterm or finals. Failure to take the exam at the assigned time and place will result in a grade of zero for that exam. Extraordinary circumstances preventing you from taking an exam at the scheduled time must be discussed in advance with the Student Affairs Office (1128 Pacific Hall) and Dr. Pruneda-Paz. If an exception is made for these extraordinary circumstances, a make-up will be an oral exam (in person or via Zoom) given by Dr. Pruneda-Paz.

Guidelines for online exams (Canvas/Zoom):

- 1) Exams will be taken online and can only be attended synchronously (dates and times are indicated in the class schedule).
- 2) Exams will be taken using Canvas. You must not leave the Canvas page during the exam (please note that this will be monitored automatically by Canvas).
- 3) Exams will be proctored via Zoom. All students taking the exam **MUST** join the Zoom session (Zoom meeting link in the class website "Zoom LTI PRO" folder). You must not turn off your camera or leave your camera or Zoom session at any time during the exam.
- 4) You can have a piece of scratch paper if needed to work out problem questions, but you cannot have any other type of note (as it would be the case for a regular classroom exam).
- 5) An ID card (student ID or driver's license) will be required at every exam.
- 6) No bio breaks will be allowed for the midterm exam, so please plan ahead.

Grading:

Letter grades will be assigned as follows:

97-100%: A+
90-97%: A
87-90%: B+
80-87%: B
77-80%: C+

70-77%: C
60-70%: D
Below 60%: F

Graded exams will be made available through the class website ~one-week after the exam date.

Requests to reconsider grading must be submitted in writing to the instructor (Dr. Pruneda-Paz) by e-mail. The full request must be received **within one week** of the exam return date. A regrading request will cause the entire exam to be regraded.

Extra credit:

There will be two ways of obtaining extra credit points (up to 10%):

- 1) **Discussion section participation (up to 5% of extra credit)**: you will get 1% per attended discussion section up to a maximum of 5%.
- 2) **In class iClicker use (up to 5% of extra credit)**: you will get 0.5% of extra credit per class if you provide an answer for at least 75% of the iClicker questions asked during lecture (note that this is based entirely on clicker use, not on whether you get the answers right). To get full extra credit (5% maximum) you need to use the iClicker in 10 out of the 16 classes in which iClicker usage is monitored (lectures 4-19).

To get credit, make sure that your iClicker is registered in the class website by week 2 (no later than Tuesday Oct 4 before class).

Cheating with clickers by having someone other than yourself using your clicker during class is considered a breach in academic honesty and will result in the loss of all clicker points for the quarter for both yourself and the person bringing your clicker, as well as any additional disciplinary actions as indicated by the policy to maintain academic honesty. Correct clicker use will be monitored by the instructor and IAs during class.

TIPS ON HOW TO DO WELL:

BIMM 100 (like many other university courses) is complex enough to reward the student who gives some thought to how to take it. **The most important trick is to keep up.** The pace is unrelenting because BIMM 100 must sometimes move rapidly using less than 20 lectures to cover the field of molecular biology, which is a rapidly expanding field due to intense research.

The following practices will help you best prepare for the exams:

1. Print out lecture slides before each lecture.
2. Take good notes during lectures (the lecturer will often use the board for explanation, which slows down the pace and allows you to take notes on the lecture slides).
3. Participate in class.
4. Make sure that you understand the topics in each class. Many lectures will be based on knowledge of previous ones.
5. Work through assignments alone or in groups - always before Discussion Sections (assignment questions will give you the best idea of how exam questions are formulated).
6. Actively participate in peer discussions (discussion sections and discussion forum). Your grade will be decided entirely from your final score and not based on how you do compared to other students in the class. Note that research on learning has shown that whether you

are on top of the material or are having a hard time understanding the concepts, you will improve your learning by discussing the material with other students. Participation in study groups and in peer discussions is therefore highly recommended.

7. **Seek for help as early as possible.** If you need further explanation or clarification on any topic use the many resources that this class provides to keep up (depending on your learning style you could read the textbook, use the discussion forum, seek for peer mentoring or to study with a small group of students, or use IA and professor office hours).
8. **A note of caution:** Memorizing slides and texts is not an efficient method of learning. While some memorization is required to become literate in molecular biology, the primary goal of the course, and what you will be primarily tested on, is understanding the key concepts of molecular biology and using this to formulate predictions and to interpret observations from simple molecular biology experiments. These skills are best achieved by following the practices listed above.

CLASS POLICIES:

Attendance: Attendance to lectures and discussion sections is optional, but very strongly recommended. You simply will not do well in the class if you are not up to date with the topics explained in lecture.

Classroom etiquette: Please refrain from eating, reading newspapers, surfing the web, texting and engaging in conversations (except when prompted during clicker questions), or anything else that might distract others and yourself from paying attention during lectures. Please make sure to shut off cell phones. If you must leave class early, please sit in the back in an aisle seat so you can exit with the least amount of disruption.

Academic integrity: Students are expected to do their own work, as outlined in the UCSD Policy on Academic Integrity ("Academic integrity" folder in the class website). **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.

Letters of recommendation requirements: Acceptance into programs to further your education can be very competitive and thus you should carefully choose letter writers who know you well and who can honestly state that you achieved one of the top scores in their class and that your demonstrated enthusiasm, diligence and hard work makes the writer confident that you will be an excellent candidate for the school of application. Therefore, for me to write a letter of recommendation, you must have received an 'A+' in the class and you must have been an active participant that I have had a chance of interacting with during the quarter. Given the size of the BIMM 100 class, lecturer's of smaller classes or labs, or research supervisors, will usually know you much better and their letters of recommendation will therefore usually carry much more weight.

Disabilities: Students requesting accommodations and services due to a disability for this course need to 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. **Please note that 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.

Responsibilities: In a class of 300+ students it is impossible to teach directly to everyone's needs. It is my (and the IAs) responsibility to come to class well prepared and to provide students with multiple pathways to learning the topics, including lecture slides, explanations on the board, assignments, discussion sections, and office hours.

It is your responsibility to put a significant effort into the class, by coming to class with printed lecture slides, taking notes, actively participating in class/peer discussions, reading the textbook, working through assignments and actively participating in the discussion of assignments during IA discussion sections.

This way, BIMM 100 should be an enjoyable and exciting learning experience.

Embrace this opportunity to understand the basics of molecular biology and, perhaps, one day you will contribute to this rapidly growing field in biology and medicine!

GOOD LUCK!