

BIMM100 (Molecular Biology) SYLLABUS

Spring 2020 (online course), 4 units

This syllabus is subject to change, 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.

Professor: 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: Tuesdays and Thursdays 5:00 - 6:00 PM (US Pacific Time), online.
(Zoom meeting link in the class website "Zoom LTI PRO" folder).

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

Lectures: Tuesday & Thursday, 12:30-1:50 PM (US Pacific Time) via Zoom.
(Zoom meeting link in the class website "Zoom LTI PRO" folder).

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

Exams: MIDTERM (online), Tuesday, May 5 (12:30 - 1:50 PM, US Pacific Time).
FINAL EXAM (online), Monday, June 8 (11:30 AM - 2:29 PM, US Pacific time)

Instructional Assistants (IA):

Name	e-mail	Office hour date (US Pac Time)
Nevarez, Andres Jose	ajnevare@ucsd.edu	Tuesday (2-3PM)*
Chevez, Joshua	jchevez@ucsd.edu	Tuesday (2-3PM)*
Setty, Prithvi Valentine	pvsetty@ucsd.edu	Friday (3-4 PM)*
Flores, Matias	maf039@ucsd.edu	Thursday (2-3PM)*
Gong, Winnie Hui	whgong@ucsd.edu	Friday (11AM-12PM)*
Lee, Cecilia	cel038@ucsd.edu	Thursday (2-3PM)*

* Zoom meeting link for Office Hours in the class website "Zoom LTI PRO" folder.

Important dates:

Must confirm at: <https://blink.ucsd.edu/instructors/courses/enrollment/calendars/2019.html>.

April 2: Professor and IA office hours start.

April 13: discussion sections start.

May 5: Midterm exam

June 8: Final exam.

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 ~250 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.

Note that all lectures will be delivered synchronously via Zoom and will be recorded. Lecture recordings will be available asynchronously to all students on the class website "Media Gallery" folder ~2 hours after each lecture).

Textbook: Lodish et al. 'Molecular Cell Biology' 7th (2012) / 8th edition (2016), 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.

Clickers: will not be used this quarter.

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 class 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 synchronously via Zoom once a week, most weeks of the quarter (schedule in class website).

Note that each IA will lead one or two discussion sections (indicated in discussion section schedule) and that IAs will provide a separate link for the Zoom meeting to the students enrolled in each section.

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: 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 class website): will provide a virtual space for organized discussions on academic and non-academic class topics, giving an additional tool to address specific questions. 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 hours will be held via Zoom. Dates/times are indicated in the first page of this Syllabus and meeting links are available in the class website “Zoom LTI PRO” folder.

Study Group organized by UCSD’s Teaching + Learning Commons: these sessions will be a place to: work on challenging concepts, learn from and with your peers, schedule a regular time and place to study to help avoid procrastination, explain material to other students to solidify your knowledge. The Study Group is facilitated by Peer Leaders who have already successfully completed the course at UC San Diego and are trained in collaborative learning techniques.

The Study Group session will meet on Wednesdays from 5:00-6:20 PM through Zoom (<https://ucsd.zoom.us/j/939464354>).

Please contact the study group leader, Huy Le (hul104@ucsd.edu) for additional information.

EXAMS:

(note that the specifics how exams will be given are still being worked out and are subject to change. You will be informed about the final details as soon as possible).

Exams will be taken online and can only be attended synchronously (dates and times in class schedule)

There will be two exams: one midterm exam and one final exam

Your grade in BIMM 100 is based entirely on the cumulative score of midterm and final exams:

Midterm (40% of final score): The midterm exam is closed book and given during class time. It covers the material discussed up until the exam (see class schedule). The time of the midterm can be found in the schedule.

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

Extra credit (up to 5%): There will be extra credit points that will be granted based on discussion section attendance (1% per attended discussion section up to a maximum of 5%).

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

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 submitted in writing and include official documentation of the cause as far in advance as possible to the instructor (Dr. Pruneda-Paz). If an exception is made for these extraordinary circumstances, a make-up will be an oral exam via Zoom given by Dr. Pruneda-Paz.

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

Requests to reconsider grading must be submitted in writing to the instructor (Dr. Pruneda-Paz) by email. 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.

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

Note that this quarter you will have the option of choosing a Pass/No pass grade instead of the letter grade (a letter grade of C or better translates to a Pass grade).

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 do not put in significant effort.

Class participation: during synchronous lectures, all students will have video and microphone disabled. This will prevent a potential low quality meeting due to heavy data traffic and disruptions from the background noise of each attendee.

There will be several instances where you'll be able to participate during lecture. If you have a question during lecture you can:

- 1) **(preferred) use the “raise hand” tool in Zoom** (under the “participants” tab) to call instructors attention. If you raised your hand, we will enable your microphone functions so you can ask your question.
If you raised your hand but your question is answered before your turn to ask please make sure that you “lower your hand” in Zoom (this will allow us to answer more questions whenever possible).
- 2) post a question in the Zoom chat. IAs will monitor Zoom chat questions. (please also use the Zoom chat if you are experiencing any technical problem).

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 200+ 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!