BIMM100 – Molecular Biology

Summer I, 2023 RCLAS: Use zoom link below for every lecture <u>https://ucsd.zoom.us/j/98686736088</u> <u>Meeting ID: 986 8673 6088</u> M, W at 11am-1:50pm

Course Description

BIMM100. Molecular Biology (4 quarter units) 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. Prerequisites: BILD 1; BIBC 103 or BILD 4 or BILD 70 or BIMM 101; BENG 120 or CHEM 40A or CHEM 40AH; BENG 120 or CHEM 40B or CHEM 40BH.

Instructor

Instructor: Corinne Moeller-McCoy, PhD Candidate

Email: cmoeller@ucsd.edu; Please include BIMM100 in the subject line

Office Hours: Th, F 12-1PM via zoom

Course Website: canvas.ucsd.edu Login: UC San Diego Active Directory credentials

Instructional Assistants (IAs):

Shane Samarasena; ssamarasena@ucsd.edu; OH: T 4-6PM via zoom

Rohini Gadde; rkgadde@ucsd.edu; OH: W, Th 2-3PM via zoom

Office Hours

My office hours are optional and will take place via zoom 12-1PM every Thursday and Friday. Please come to go over questions related to the problem set, lectures, readings, discussion, etc. Office hours may also be made by appointment.

IA/TA

Section A01: 11-11:50 AM; Shane Samarasena Section A02: 1-1:50 PM; Shane Samarasena Section A03: 3-3:50 PM; Rohini Gadde Section A04: 5-5:50 PM; Rohini Gadde

Inclusion Statement

I am committed to creating a learning environment that supports diversity of thought, perspective, experience, and identities. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me early in the semester so that I may make appropriate changes to my records. It is my hope that in this course we will develop a supportive learning community that will foster rich discussions through the sharing of personal ideas, experiences, and relationships to course material. Honesty, listening for understanding, a willingness to share your ideas, and respect for self and others are basic guidelines that can help. create a positive learning environment. Your participation and feedback is important to the success of the course and I welcome your thoughts throughout the semester on how we might improve class processes that will encourage effective communication and dialogue.

Course Expectations

What I expect of you

Be informed. Read this syllabus carefully and completely so you understand the course structure and expectations. **Be attuned.** Keep up with readings and lab assignments, as each one builds on the previous one.

Ethical. A good attitude and maintenance of honest and ethical principles towards me, your classmates, and the execution of the course. Please read UC San Diego's <u>Principles of Community</u> and <u>Conduct</u> <u>Code.</u>

Integrity. An honest, fair, responsible, respectful, trustworthy, and courageous effort on all academic work and collaboration. Please read UC San Diego's Policy on <u>Integrity of Scholarship</u>. Then, take the <u>integrity pledge</u>!

Be flexible. This course may be affected by the remote format or unavoidable emergencies, necessitating last-minute rescheduling.

What you can expect of me

Enthusiasm. To be prepared for each class and to bring my enthusiasm for teaching to each lecture, lab, and office hour meeting. **Responsiveness.** To respond to emails within 24 hours. For those that know me already, you know that I usually respond faster than this. Emails received on weekends or while I'm traveling may take longer.

Timely feedback. To make every effort to return graded assignments within one week of the submission date and to post solutions or code as soon as is reasonably possible after the submission date.

Integrity. To uphold integrity standards and create an atmosphere that fosters active learning, creativity, critical thinking, and honest collaboration.

Reasonable accommodation and understanding for student situations that arise; however, I will not make exceptions for one person that are not available to every other person in the course.

Course Learning Outcomes

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. You should also be able to interpret, and predict the outcome of, basic experiments to study factors and pathways in molecular biology processes. Doing well in this class requires solid prior understanding of genetics, biochemistry and organic chemistry.

Course Materials and Tools

Text/Readings/Other Material

Lodish et al., Molecular Cell Biology, 8th Edition, Freeman, 2016 is optional.

Problem set, lecture, discussion, midterm and final questions will draw largely on material presented in class.

CANVAS: Learning Management System

Login: UC San Diego Active Directory credentials

Course Format

Summer Session 2023 is offered as remote instruction. You can access the campus notice <u>here</u>. This class will take place in a hybrid format, which means that you will engage with some elements in real-time (synchronous), and other elements at your own pace (asynchronous), within due dates. Lectures, discussion and office hours will be synchronous and take place via the scheduled class time on zoom. Some lectures will be cut short so that you may complete an assignment related to lecture at your own pace (asynchronously).

It is essential that you attend real-time Lectures, Office Hours and Discussion Sections to stay connected and earn extra credit active participation points!

All problem sets, lecture questions, midterm and final are open note. You may not use Al to complete any assignments as this violates academic integrity for original work (i.e. this constitutes plagiarism). YOU are expected to complete the work assigned to you so I can see if you are learning and what you've learned; I'm not interested in knowing what your artificial intelligence tool can do or what it knows. I have a professional and ethical obligation to follow Senate Policy, which states that I must report all suspected academic integrity violations to the Academic Integrity Office, which I will do.

On the day of the midterm and final, you will have a 24 hour window to complete the exam and upload it to Canvas. Discussion time may be used to review problem set and lecture questions. Extra credit may be earned if you are an active participant during lecture.

If your score on the final is better than the midterm, it can replace your midterm grade

Grading Information

Summary of Grade Criteria

Course Component	Points	Weight
LECTURE	210	16%
Course Introduction	15	
Research Assignments (4 @ 30 points each)	120	
Bio-interactives (2 @ 60 points total)	60	
Final Reflection	15	
DISCUSSION SECTION	750	58%
Problem Sets (5 @ 150 points each)	750	
QUIZZES & EXAMS	340	26%
Midterm	170	
Final	170	
TOTAL	1300	

Grading Scale

Grading Scale							
A+	98% - 100%	B+	88% - < 90%	C+	78% - < 80%	D 60% - < 70%	
Α	92% - < 98%	В	82% - < 88%	С	72% - < 78%	F 0% - < 60%	
A-	90% - < 92%	B-	80% - < 82%	C-	70% - < 72%	Grades will not be curved	1

Grading Procedure and Feedback

This course will <u>**not**</u> be graded on a curve, it is on an absolute scale, out of 1000 points, described above. You are therefore responsible for <u>**every**</u> point you earn.

Please feel free to work on the problem sets together, review them in discussion, bring them to my office hours, and bring them to your IA/TA's office hours. Some of the problem set questions will be reviewed in discussion.

Attendance and Participation

Attendance and participation is not mandatory in lecture, but is strongly encouraged. Essential material for the course will be covered during lecture and extra credit points may be earned.

Attendance and participation is not mandatory in discussion, however your TA/IA will keep track of students who regularly attend and participate – at the end of the quarter these students will eligible to earn extra credit. Furthermore, answers to the problem sets will ONLY be discussed in discussion and in office hours. You are encouraged to work together to complete the problem sets. Answer keys will NOT be posted to the course website. If you would like to work with your peers, your TA and I to get to the correct answer, attendance at either discussion or office hours is your opportunity to do so.

Late or Missing Assignments

Deadlines described below must be adhered to. Please contact me ASAP if deadlines cannot be met. If I do not hear from you, late or missing assignments will receive a zero.

Course Schedule

REVIEW THIS SCHEDULE OFTEN TO ENSURE DEADLINES ARE MET.

Week	Day	Date		Lecture	Section	
				Lecture	Assignment, Activities, Due Dates	Discussion
	M 7/3		L1	Introduction; Overview Central Dogma; DNA structure; DNA replication/repair Chromosomes and Telomeres Recombinant DNA Techniques		
1	Tu 7/4			PCR 4 th of July Holiday		A01: 11-11:50AM A02: 1-1:50PM A03: 3-3:50AM
	W 7/5		L2	DNA sequencing Northern Blotting Southern Blotting Western Blotting	Course Introduction Due	7.00. 0 0.00710
	Th 7/6				Bio-Interactive #1 Due	A01: 11-11:50AM A02: 1-1:50PM A03: 3-3:50AM A04: 5-5:50PM
	Sun 7/9				Research Assignment #1 Due	
2	M 7/10		L3	Transcription Gene Expression in Prokaryotic Organisms	Problem Set #1 Due	
	Tu 7/11					A01: 11-11:50AM A02: 1-1:50PM A03: 3-3:50AM A04: 5-5:50PM

	W	L4	Gene Expression in		
	<i>1</i> /1Z		Eukaryotic Organisms		
			Eukaryotic Pol-I, -II, -III		
			transcription		
			Activation and repression of		
			Transcriptional Initiation		
			Regulation of Transcription Factor Activity		
	Th			Bio-Interactive #2	A01: 11-11:50AM
	//13			Due	AUZ: 1-1:50PM A03: 3-3:50AM
					A04: 5-5:50PM
	Sun			Problem Set #2	
	7/16		MIDTEDM	Due Midterrecter	
	IVI 7/17		MIDIERM	Midterm to be	
	,,,,,			11:59PM	
	Tu				A01: 11-11:50AM
	7/18				A02: 1-1:50PM
3					A03: 5-5:50PM
	W	L5	mRNA capping, nuclear	Research	
	7/19		export	Assignment #2	
			Polyadapylation	Due	
			Folyadenylation		
			Post-transcriptional gene		
			regulation		
	Th 7/20				A01: 11-11:50AM
	1120				A03: 3-3:50AM
					A04: 5-5:50PM
	Sun 7/23				
	M	L6	Translation		
	7/24	-			
4			mRNA turnover		
	Tu		RINA POlymerase I/III	Problem Set #3	A01: 11-11:50AM
	7/25			Due	A02: 1-1:50PM
					A03: 3-3:50AM
	\٨/	17	Non-coding RNA	Research	A04: 5-5:50PM
	7/26		NOT-COULLY INTA	Assignment #3	
	-		RNA Quality Control	Due	
			Chromotin Domodaling		
	Th				A01: 11-11:50AM

	7/27 Sun 7/30			Problem Set #4 Due	A02: 1-1:50PM A03: 3-3:50AM A04: 5-5:50PM
5	M 7/31	L8	Chromatin Immunoprecipitation Genomics Cancer	Research Assignment #4 Due	
	Tu 8/1				A01: 11-11:50AM A02: 1-1:50PM A03: 3-3:50AM A04: 5-5:50PM
	W 8/2		Review Session (Presented by your peers; 10pts E.C.)		
	Th 8/3			Problem Set #5 Due	A01: 11-11:50AM A02: 1-1:50PM A03: 3-3:50AM A04: 5-5:50PM
	F 8/4		FINAL EXAM	Final to be submitted by 11:59PM	

UC San Diego Principles of Community

The University of California, San Diego is dedicated to learning, teaching, and serving society through education, research, and public service. Our international reputation for excellence is due in large part to the cooperative and entrepreneurial nature of the UC San Diego community. UC San Diego faculty, staff, and students are encouraged to be creative and are rewarded for individual as well as collaborative achievements.

To foster the best possible working and learning environment, UC San Diego strives to maintain a climate of fairness, cooperation, and professionalism. These principles of community are vital to the success of the University and the well being of its constituents. UC San Diego faculty, staff, and students are expected to practice these basic principles as individuals and in groups.

Click here for the complete UC San Diego Principles of Community in English and Spanish.

Student Resources for Support and Learning

ACADEMIC SUPPORT

<u>Geisel Library</u>	Research tools and eReserves
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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 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 <u>Office of Equity, Diversity, and</u> <u>Inclusion</u> 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

Additional Optional Information

Subject to Change Policy

The information contained in the course syllabus, other than the grade and absence policies, may be—under certain circumstances such as mutual agreement to enhance student learning—subject to change with reasonable advance notice, as deemed appropriate.

Letter of Recommendation Policy

If you would like a letter of recommendation, a minimum grad of an A- must be earned. I also encourage you to come office hours, engage in active class participation and demonstrate qualities that may be included in a LOR. Please provide a month notice prior to LOR deadline submission.

Technology Policy

This is an online course, and therefore online resources are available to you for integrated questions, problem sets, the midterm and final.