

COURSE SCHEDULE
 MW SOLIS 107: 5:00 - 7:50 pm

Date ^(**)	Lecture#	Planned Topic	Lodish (<i>Chapter: Pages</i>)
<i>Genes & Genomes</i>			
8/5	1	DNA, DNA Replication	Overview, Central Dogma 2: 36-37; 4: 115-120 4: 145-151
8/7	2	Telomeres DNA repair Genes & genomes <i>Sequencing</i>	6: 273-275 4: 151-159 6: 223-231 5: 195-197
8/12	3	Noncoding & Mobile DNA <i>PCR</i> Recombinant DNA <i>Gene inactivation</i>	6: 231-245 5: 192-193 5: 182-198, 201-206. 5: 212-216
<i>Basic Mechanisms of Gene Expression</i>			
8/14	4	Transcription <i>Northern blotting</i>	4: 124-127; 7: 290-297 5: 198
8/19	5	Midterm 1 (in class; covers Lectures 1-4 Eukaryotic Pol-I, -II, -III transcription rRNA, tRNA processing mRNA capping, polyadenylation	7: 297-305, 336-339 8: 384-391 8: 345-349, 358-360
8/21	6	pre-mRNA splicing Nuclear export Translation mRNA turnover	8: 351-356 8: 365-368 4: 131-144 8: 375-376

Regulation of Gene Expression

8/26	7	Transcriptional Regulation: Prokaryotes TR in Eukaryotes Microarrays	7: 282-285 7: 288-290, 302-305 5: 199-201
8/28	8	Transcription Activators Chromatin Chromatin remodeling <i>Chromatin immunoprecipitation</i>	7: 305-314, 320-322 6: 256-266 7: 315-320, 323-333 7: 297

Monday 9/2; Labor Day; NO CLASS

9/4	9	Post-transcriptional gene regulation Gene regulation by non-coding RNAs RNA quality control	8: 360-365, 374, 376-384 7: 331-335 8: 370-374 8: 380
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9/6 FINAL EXAM 7:00 - 9:59 PM

INSTRUCTOR

Dr. Keefe Reuther,

Division of Biological Sciences

Office: HSS (Humanities and Social Sciences Building) 1145D

Office hours: Wednesday (10:00am-12:00pm) or by appointment

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VENUES

Lectures: MW SOLIS 107: 5:00- 7:50 pm

COURSE PREREQUISITES

BICD100 (Genetics), BIBC100 or BIBC 102 (structural or metabolic biochemistry), and their prerequisites, including BILD1 and organic chemistry. 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), 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 and how insights into these concepts have been gained through experimental observations. You should also be able to interpret, and predict the outcome of, basic experiments to study factors and pathways in molecular biology processes. The specific topics covered include 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. Doing well in this class requires solid prior understanding of genetics, biochemistry and organic chemistry.

CONTACT:

Your TA's and fellow students are your best resource for information and you should first attempt to answer your questions through them. Try using the discussion board on TED or emailing your TA's through TED. Contact Dr. Reuther first only for specific issues unrelated to course content. The best way to contact him is by email. On all emails PLEASE put BIMM 1 in the subject line to indicate that the email pertains to this course. Also, if you email a question the evening before an exam please send it before 5 PM. If you email about anything regarding your status in the course, please include your UCSD username, and PID.

TEXTBOOK:

Lodish et al. 'Molecular Cell Biology' 7th edition, Freeman, 2012. There are copies on reserve in the Biomedical Library. It is a reasonable and clear reference to own if you will continue in the biomedical sciences and is also used in BICD 110 - Cell Biology. It will give you another view of the material treated in lecture. The subjects treated in lecture are the materials you will be tested on, though the particular questions may be formulated using material from the book. Reading the same topics in the book explains the selection of topics a second time, sometimes in greater depth. Some nice animations and other helpful material related to the book can be found at the textbook web site: <http://bcs.whfreeman.com/lodish7e/>

LECTURE:

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. The lectures are divided into three sections covering 1) Genes & Genomes, 2) Basic mechanisms of gene expression, and 3) Regulation of gene expression. 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 schedule.

On the day before each lecture (at the latest), a copy of the lecture slides (in pdf format) will be uploaded on 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 it. 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.

CLICKERS: not used in this course.

PODCASTING: Class lectures are podcast and are available for download soon after lecture. Download podcasts at <http://podcast.ucsd.edu/>

TECHNOLOGY POLICY:

The use of cell phones or any other electronic devices (e.g. pagers, text messaging, PDAs, etc.) is not permitted during exams. Cell phones or other communication devices must be turned off and stored before entering the lecture hall at all times. Use of a cell phone, PDA, or other similar electronic devices during an exam, quiz or assignment is grounds for receiving a failing grade.

Laptop computer policy: Students are welcome to bring laptops to lecture for note-taking purposes. Laptops must be put away (closed and powered off or on sleep mode) during any lecture quizzes, assignments or exams. Unless specifically given permission by Dr. Reuther, you may NOT access the web during the lectures. This is extremely distracting to neighboring students and will not be tolerated. Any student found using the web during class time will be required to turn off their computer for the remainder of the lecture and may be denied permission to use a computer in class thereafter.

WEB SITE:

Everything related to the class is kept on the TED site (<https://ted.ucsd.edu/webapps/login/>). Access Ted from your iPhone, iPod Touch, iPad, Android, Palm OS and BlackBerry mobile device by searching your device's application store for "Blackboard Mobile Learn" to download. Access is only available for Wi-Fi, access is not available from your cellular network. Announcements of exam room changes and many other important matters will be posted on the TED site. Check the site often! There will also be an online discussion board on the site, moderated by the TA's. You can ask the TA's questions, and discuss interesting matters that come up in class. Grades for the midterm exams will all be posted on the website.

GRADING:

Section Quizzes (10 points each)	40 points
Molecular Biology Essay	40 points
Midterm Exam	100 points
Final Exam	250 points

These guidelines will be used to assign grades:

- > (85%) A (A-, A or A+)
- > (75%) B (B-, B or B+)
- > (60%) C (C-, C or C+)
- > (50%) D

If necessary, these cutoffs will be adjusted downward so that at least 50% of students in the class receive an A or a B, but they will not be adjusted upward for any reason.

EXTRA CREDIT: Prior to each exam, there will be practice problem sets made available on TED. You may earn up to 5% extra credit toward your course grade for completing these problem sets.

SECTION QUIZZES. During section meetings there will be a quiz. The quiz will be given during the 1st 15-20 minutes of section (at the TA's discretion, depending on the length of their particular quiz). If you are late, you will have whatever time is remaining of the time allotted. If you are later than that, you will not be able to take the quiz. If you have issues getting to class on time, discuss them with your TA before it is a problem. You will have a quiz during your first discussion section.

MIDTERM EXAMS: MAKE-UP EXAMS ARE NOT AVAILABLE. EXAMS ARE OFFERED AT THE SCHEDULED TIME ONLY. Advise your coaches, teammates, traveling companions, significant others, and families accordingly. The exam will consist of multiple choice, short essay, short answer, and quantitative or graphical material designed to test your ability to synthesize information presented in the lectures and readings. The midterm exam will be based on material up to the lecture preceding the exam unless announced otherwise in class.

FINAL EXAM: EARLY EXAMS ARE NOT AVAILABLE. Watch for the announcement in class and on the web site about the location. The final will be cumulative. Approximately 1/3 of the final will be on the material from after the second midterm, and 2/3 of the final will be cumulative from material covered the entire session.

MISSED EXAMS: There are no make-up exams, so unexcused absences from scheduled exams will be recorded as zeroes. Unusual and serious problems that affect your ability to take a scheduled exam (e.g., death or serious illness in the family or personal tragedy) must be communicated to Dr. Reuther directly. You will be required to provide official documentation of an unavoidable emergency (e.g., serious illness, etc.). Without such documentation, you will receive a zero for that exam. For a missed midterm exam with valid documentation, the remaining midterm and final exam will count for the entire test portion of your grade. For a missed final with valid documentation, you will be issued an incomplete grade, which can then be made up with the instructor after the end of the quarter.

RE-GRADES: It is your responsibility to check your exam for clerical errors in grading. If a grading error has been made, you should submit a re-grade request to Dr. Reuther at the end of a lecture within one week of return of the exam. The time and date of closing down the appeal process will be announced in class. Simply write “please re-grade Q #” or “arithmetic error on p. #” on the cover of your paper. Write a concise description of the alleged error on a separate, attached piece of paper. No re-grades are possible for exams written in pencil or non-permanent ink. Students who submit exams for re-grading understand that we may (1) re-grade the entire exam, and (2) compare the submitted paper to a scanned copy of the original exam. Since course grades are due with the Division of Biology 72 hours after the final exam is given, re-grades of the final will be handled as follows: Graded final exams will be available for pickup a few days after the final is given. Re-grade requests are to be placed under Dr. Reuther’s office door within one week after graded exams are made available. If the re-grade request is valid and it affects the letter grade of the student in the course, then Dr. Reuther will change your course grade accordingly.

OSD students: 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. For more information, contact the OSD at (858) 534.4382 (V); (858) 534-9709 (TTY); osd@ucsd.edu, or <http://osd.ucsd.edu>.

CHEATING: DON'T. Students are expected to do their own work, as outlined in the UCSD Policy on Integrity of Scholarship (go to TritonLink: Academics: Academic success: Academic integrity). Cheating will not be tolerated, and we will fail any student caught engaging in academic dishonesty. Their identity and the evidence of cheating will be passed to the relevant campus staff for further action. All exams will be closed book and closed-notes; all personal materials including cell phones must be stowed under your seat while exams are in progress. All assignments are to be completed individually, unless otherwise noted.

COURSE IMPROVEMENT: Your constructive criticisms are welcome. Dr. Reuther is available immediately after lectures, at his scheduled office hours, and by email anytime.

SECTIONS AND SECTION MEETINGS: Students have the opportunity to meet with a Teaching Assistant in relatively small groups on a weekly basis. There will be no sections during the first week of classes.

You must sign up for a Section after the first class meeting using <https://sections.ucsd.edu>. Instructions will be announced in class that day. There is a limit of 33 students for each section. Wait listed students should also sign up for sections now but there is no guarantee that they will eventually become enrolled in the class.

The section meetings provide for:

1. Academic review. Each week the TA will provide an opportunity to review the previous week's lectures and readings. This review may take the form of answering your specific and general questions, clarifying something important presented quickly in lectures, expanding on something important described in the textbook, or working through a numerical problem of the type found on the exams. To benefit from these meetings you must prepare by completing both your lecture notes and the assigned reading. There is no need to bring the textbook to the Section meeting.
2. Advice on studying. In particular, the TA's may be able to steer you through the enormous amount of descriptive material in the textbook. They will not know what will be on the exams but they are experienced enough to know how to set learning priorities. They meet with the professor before each class and can give you his advice on what's important and what is less likely to be a focus on exams.
3. Graded quizzes. During section meetings there will be a quiz. The quiz will be given during the 1st 15-20 minutes of section (at the TA's discretion, depending on the length of their particular quiz). If you are late, you will have whatever time is remaining of the time allotted. If you are later than that, you will not be able to take the quiz. If you have issues getting to class on time, discuss them with your TA before it is a problem. You will have a quiz during your first discussion section.
4. General course announcements. We will make numerous announcements about the course and course-related opportunities.
5. General advice. The TA's are a lot easier to find than the professor so please direct your questions about other courses, majors, careers, summer opportunities, study abroad opportunities to them, in the first instance

Schedule of Section Meetings:

Section #	Day	Time	Building	Room	TA
A01	M	08:00a - 09:50a	CENTR	205	Sara
A02	M	10:00a - 11:50a	CENTR	205	Sara
A03	M	12:00p - 1:50p	CENTR	205	Eric
A04	W	08:00a - 09:50a	CENTR	205	Jeff
A05	W	10:00a - 11:50a	CENTR	205	Jeff
A06	W	12:00p - 1:50p	CENTR	205	Eric

Be prepared to select your section time using sections.ucsd.edu after the first class meeting.

Teaching Assistants:

Name	email
Dyo, Jeffrey Gary	jdyo@ucsd.edu
Patten, Eric Michael	epatten@ucsd.edu
Pennebaker, Sara Lynne	spenneba@ucsd.edu

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.

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

1. Print out lecture slides before each lecture.
2. Be present and 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. Read the textbook – preferably before class (planned topics and corresponding textbook pages are indicated in the schedule).
4. Attend discussion section and prepare well for it. Go through the previous week's material and come up with specific topics or questions for the TA to clarify. Identify the material that is giving you trouble early.
5. Take all the material from lecture, the podcast, the textbook, and the PowerPoints and consolidate it in a fashion that makes sense. The key to understanding and remembering so much complex concepts and terminology is to ORGANIZE, ORGANIZE, ORGANIZE!

In addition, the “Solved Problems” at the end of each *Lodish* Chapter can give useful practice in problem solving.

Since your grade will be decided entirely from your final score and not based on how you do compared to other students in the class, it will never hurt you to help fellow students. In fact, 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 discussion of clicker questions is therefore highly recommended.

A note of caution: Memorizing slides and texts is not an efficient method of learning for this class. 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 as tested primarily through problem solving questions in the exams. These skills are best achieved by following the practices listed above.