

## CHEM 4360: Molecular Biology

Fall 2019

Tuesday and Thursday 8:00 am – 9:20 am

**Synchronous via Zoom**

### **Instructor:**

Dr. Karen A. Lewis

Email: karen.lewis@txstate.edu

Office Hours: Mon, Tue, Wed, Fri 10 – 11 am and by appointment

Zoom Office: <https://txstate.zoom.us/xxxxxxx>

Office: CENT 401B

Phone: 512-245-6391

**Course Description:** This course provides Biochemistry majors and minors with advanced knowledge of the field of molecular biochemistry. Topics include gene expression (transcription and translation of genes in bacteria and higher organisms), post-translational modification of proteins, chromosomal DNA replication, cell cycle checkpoint controls, DNA damage and repair, as well as theories of cancer and aging.

**Prerequisites:** CHEM 3375 or CHEM 4375 with a minimum grade of D. Advanced Biochemistry builds directly on the material covered in CHEM 3375/4375. If you have not mastered that material, you begin this course at a significant disadvantage.

**Course Format:** This course will be administered as synchronous class, using the “flipped” classroom format. **Set your alarms for Tues/Thurs mornings!** Pre-class lectures will be presented via Canvas, and class meetings will be held synchronously via Zoom. Students must use their Texas State NetID log-in for both Zoom and Canvas platforms.

In preparation to be part of the CHEM 4360 remote learning community in Fall 2020, students are strongly advised to take the [Texas State University Online Learning Readiness Assessment](#).

Through these two platforms, multiple instructional formats will be used to accommodate different learning styles. Students are expected to be active participants in their learning by reading the assigned material, engaging in the material presented, and participating in classroom activities.

***Assigned reading material:*** Students are expected to read the material assigned before class in preparation for a focused discussion of the more challenging aspects of the topic.

***Pre-class lectures:*** Students are expected to fully view the pre-class lectures posted on Canvas before each synchronous class meeting. For some material, brief quizzes will review the lecture material and will be due before class; for other material, in-class activities will draw directly on lecture material and be due at the end of the synchronous class meeting that follows the pre-class lecture.

***Problem sets:*** The primary activity in the synchronous class meetings will be detailed problem sets that review and apply the material presented in the online pre-class lectures. These problem sets will be graded for both completion and correctness.

***Student presentations:*** Some material will be taught through student presentations. This information is as important as other material presented by the textbook, lecture, or problem sets, and will be included in graded assessments.

## Course Objectives

After completion of this course, the student should be able to:

- Employ a working vocabulary of biochemical and molecular biology terms (*i.e.*, give a definition, use terms in context, and apply the term in a new context).
- Identify and explain the structure of nucleic acids.
- List and explain the cellular functions of nucleic acids.
- Predict and explain the behavior of biomolecules and biochemical systems by applying chemical principles to these systems.
- Describe the current understanding of the molecular biology processes of DNA replication, DNA repair, gene expression and regulation, and protein synthesis.
- Explain and interpret data produced from a variety of molecular biology techniques.
- Interpret experimental data and relate their interpretation to the current understanding of molecular biology processes.
- Solve problems involving nucleic acids by utilizing molecular biology techniques.
- Read and interpret a scientific research article and be able to articulate its contents in both written and oral formats.
- Work cooperatively in teams to identify a problem, create a plan, and complete a task.
- Assess the quality of presentations by others and oneself.

## Course Grades and Assessment

With the “flipped classroom” format, this course uses a variety of assignments and activities for student learning and assessment. The overall scheme for grading the course assignments is detailed below. With this distribution, 67% (2/3) of the course grade is determined by “process” assessments, in which students will get regular feedback on their learning. The remaining 33% (1/3) of the course grade is determined by examinations.

Letter grades are assigned as percentage of points earned:

A	≥ 89.5%
B	79.5 – 89.49%
C	69.5 – 79.49%
D	59.5 – 69.49%
F	≤ 59.49%

The instructor reserves the right to adjust grading depending on student performance. Any changes to this policy will be announced in class and on Canvas.

	Number	Points Each	Total Points	Final Points		
Problem Sets	7	20	140	<b>120</b>	<i>drop lowest 1</i>	
Concept Maps	7	20	140	<b>120</b>		<i>drop lowest 1</i>
Weekly quiz	14	10	140	<b>120</b>		<i>drop lowest 2</i>
Exams	4	50	200	<b>200</b>		
Literature critique				<b>240</b>		
<i>selections</i>	1	10	10			
<i>outline</i>	1	20	20			
<i>peer eval outline</i>	2	15	30			
<i>poster/pres</i>	1	50	50			
<i>peer eval presentation</i>	2	15	30			
paper	1	100	100			
Final Exam	1	100	100	<b>100</b>		
<b>SEMESTER TOTAL:</b>				<b>900</b>		

**Quizzes:** Weekly quizzes will be administered on Canvas to assess student comprehension of the pre-class recorded lecture material that is posted on Canvas. The quizzes will be timed, but may be started at any point prior to the class meeting during which the relevant material will be referenced. There are no make-up quizzes. At the end of the semester, the lowest two (2) quiz grades will be dropped.

**Problem Sets:** In-class problem sets will be used regularly to introduce, explore, comprehend, analyze, and apply course material. Students may complete problem sets either electronically (*i.e.*, annotate a PDF) or as a hard copy (*i.e.*, print out, complete by hand). To submit completed problem sets for grading and assessment, students must submit a PDF copy (annotated PDF or a scanned version of the paper copy, using Adobe Scan or similar). *If this presents a technological challenge to you, alternative arrangements are possible; please talk with Dr. Lewis during the first week of the semester.* Late assignments will not be accepted. At the end of the semester, the lowest problem set grade will be dropped.

**Concept Maps:** Problem sets will be interspersed with small-group concept map activities. Please sign up for a FREE account with [padlet.com](https://padlet.com).

Our class überpadlet will be located here – add it to your Padlet to get started!

<https://padlet.com/xxxxxxx/yyyyyyyy>

Dr. Lewis will set each small group AND each student up with individual Padlets, so that small groups can work together and so that individual students can submit their final concept maps for each module, which will be the material that is evaluated for a grade. More details about the Padlet environment and structure will be discussed in class. Late assignments will not be accepted. At the end of the semester, the lowest concept map grade will be dropped.

**Exams:** Exams will be administered in a take-home format. The exam will be released as a fillable electronic document on Canvas at the end of class, and students will have 46 hours to complete the exam and return the completed work. Students may complete the exam in one of two ways: (1) completely electronically (by filling in the form sections), saving and submitting to Canvas; (2) by printing the file, completing the exam on paper, and then scanning the pages with Adobe Scan to create an electronic file that will then be uploaded to Canvas. *If this presents a technological challenge to you, alternative arrangements are possible; please talk with Dr. Lewis during the first week of the semester.*

The exams will draw on material covered by Canvas lectures, synchronous class activities, textbook reading, suggested problems, problem sets, student presentations, and other assignments. While all exams are effectively cumulative, the semester exams will emphasize topics covered since the previous exam. The final exam is cumulative.

Exam	Possible Points	Dates (open – due)
1	50	Sept 15 – Sept 17
2	50	Oct 6 – Oct 8
3	50	Oct 27 – Oct 29
4	50	Nov 10 – Nov 12
Final	100	Due Dec 8 at 10:30 am

Exams will be open for **46** hours. The take-home exam will be released following the end of a Tuesday class period, and the exam will be due 30 min before the beginning of the following Thursday class period (*i.e.*, open Tues 9:30 am, due Thurs 7:30 am). No student will be allowed additional time without documented need by the Office of Disability Services. Please approach Dr. Lewis as early in the semester as possible to arrange ODS accommodations.

All effort is made to grade exams carefully and consistently. You may petition for corrections to an exam grade. Any exam corrections must be petitioned for in writing **no sooner than 48 hours and no later than two weeks** after the graded exams have been returned. The petition must contain a clear, written explanation of why you should receive additional points as well as evidence for the correct answer. Dr. Lewis may choose to re-grade the answer in question or the entire exam, resulting in gain or loss of points on other questions not being contested. **Grade corrections outside the above window will not be considered.**

If you encounter an emergency during the exam open period, please contact Dr. Lewis as soon as is reasonable for your health and safety. Dr. Lewis will determine whether there is sufficient time to complete the exam and what, if any, accommodations can be made.

Extra Credit: Bonus points are built into each exam (e.g. 55 possible points/50 graded points). No individualized extra assignments will be given.

Exam Grade Replacement: At the end of the semester, students will be given the option to replace their lowest exam score with their final exam score (scaled to 50 points). Note that this is strictly an opt-in policy; the lowest exam grade will not automatically be replaced.

## **Resources**

Textbooks: The required textbook for the class is Molecular Biology: Principles and Practice, by Cox, Doudna, and O'Donnell (W.H. Freeman). Either the 1<sup>st</sup> edition (2012) or the 2<sup>nd</sup> edition (2015) is suitable; when there are critical differences, Dr. Lewis will note it in class. A copy of the 2<sup>nd</sup> edition is on reserve in Alkek Library.

Reading the same material in a couple of different ways can often help to solidify an understanding of the material. Additional biochemistry textbooks are available in the library; books that may be particularly helpful are Molecular Biology of the Gene, by Watson *et al.*, Biochemistry by Voet & Voet, and Fundamentals of Biochemistry by Voet, Voet, & Pratt.

Scientific Journals: Biochemistry and molecular biology are constantly growing fields that change rapidly. Therefore, textbooks may be out of date by the time they reach press. The best and most recent information is found in scientific journals. Review articles found in most journals are a great summary of the current understanding on a topic. Some relevant journals carried in our library are:

<i>Biochemistry</i>	<i>Nature Structural &amp; Molecular Biology</i>
<i>Nature</i>	<i>Annual Reviews of Biochemistry</i>
<i>Science</i>	<i>Journal of Biological Chemistry</i>
<i>Cell</i>	<i>Journal of Molecular Biology</i>
<i>Molecular Cell</i>	<i>Nucleic Acids Research</i>

**Attendance Policy:** While attendance is not taken, ***you are expected to attend every synchronous Zoom class.*** Attendance is important to fully understand the material; merely reading the textbook and watching the pre-class lectures on Canvas will be insufficient. In particular, the in-class problem sets that are part of the flipped classroom will cover material that is not presented in the text or online lectures, and which will be subject to summative graded assessments like quizzes and exams. Because attendance is not taken, there are no excused absences.

**Exams:** Make-up exams will not be given. If a student begins the exam late in the open period, they will have the remainder of the exam period to complete the exam. If a student

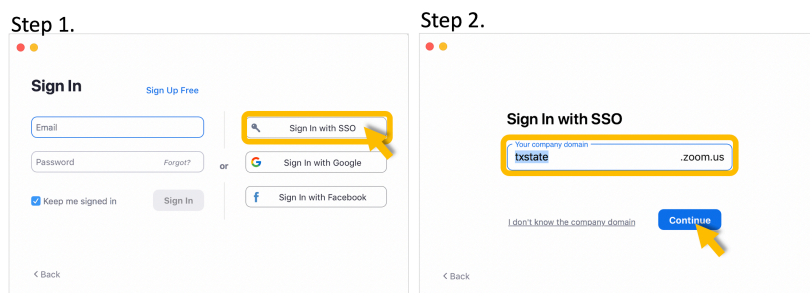
misses an exam, they may elect to replace that zero with the final exam grade as described above (“Exam Grade Replacement”). Any second missed exam will be given a zero.

**Quizzes:** Make-up quizzes will not be given. If a student misses a quiz (whether announced or unannounced), the grade for that quiz will be a zero. At the end of the semester, the lowest two quiz grades will be dropped.

**Canvas:** A course Canvas site will be used extensively during this course for both resources and assignments. Pre-class lectures will be posted here, and you are expected to log in regularly. You must have a valid Texas State University NetID and password.

Since Texas State has fully transitioned to Canvas as the new learning management system (LMS), TRACS has been sunsetted. Fall 2020 will be Dr. Lewis’ first semester using Canvas for a full course, as it may be for many students too. As of 8/12/2020, colleagues who are more well-versed in Canvas have reported some concerns about how the Canvas gradebook calculates course grades. Therefore, please note that the Canvas gradebook will be an accurate record of individual grade items, but what Canvas shows for the course average may not be accurate. Dr. Lewis’ standard practice for any LMS gradebook is to maintain a separate Excel spreadsheet, which is used to calculate end-of-semester course grades. The weights, drops and substitutions for different categories of grades are outlined below in this syllabus and will be followed in calculating your course grade. Dr. Lewis strongly recommends that each student similarly records and tracks their own individual assignment grades in a spreadsheet, as well as retain copies of all graded work for the semester.

**Zoom:** The synchronous component of this course and all office hours will be administered via Zoom. You must log in to Zoom using your Texas State University NetID and password, using the “SSO login” mechanism.



Per University policy, every class meeting will be password-protected to prevent Zoom-bombing. The Zoom link and password for class will be posted on the course Canvas site.

The main Zoom classroom meeting will be recorded, and posted to Canvas and/or Mediaflo for posterity and post-class review. The Zoom breakout rooms, in which students will work in small groups to complete the required in-class assignments, will not be recorded.

*Please be sure to routinely check your displayed name and profile picture.* They need to be professional and appropriate for an educational setting. To alter either your displayed name or your profile picture, you may adjust the “participant settings” in Zoom. A detailed protocol on how to do that will be posted to the course Canvas site.

Additional information about the professional use of Zoom for class and office hour meetings is detailed below.

**Email questions to instructor:** You are welcome to email questions to Dr. Lewis. If the email is relevant to the entire class, the response will be anonymized and posted to Canvas discussion boards. You can check this discussion board before emailing, to see if someone else had the same question. (Insider tip: if you have a question about something, it's very likely that someone else is also wondering about it, too!)

**Professionalism and Respect:** Both the University and Dr. Lewis are committed to an educational community in which each individual is respected, appreciated, and valued. Class rosters are provided with the student's legal name. All requests to address you by an alternate name, pronunciation, and/or gender pronoun will be honored. Please advise Dr. Lewis (either "in person" via a Zoom meeting, through a private Zoom-chat message, or by email) of this preference early in the semester.

In order to provide the most enriching remote learning experience, **CHEM 4360 will be held synchronously**. However, this approach introduces a unique set of concerns and issues around professionalism, as we are teaching, learning, and researching from our homes instead of in a common, neutral location. Students and faculty are full partners in fostering a virtual classroom environment which is conducive to learning. Our actions should promote respect for both one another and the traditions of collegiate learning. This includes synchronous online sessions such as those conducted in Zoom or MS Teams, among other venues.

**Audio/Visual Professionalism:** Per University policy, students are expected to dress and act appropriately and professionally for all video and synchronous sessions. This includes creating videos for classes and participating in real-time video conferences or exams. It is expected that the video be turned on and you be in a private setting. Please do not plan to join Zoom meetings while you are driving or not in a confidential environment, to respect your privacy and ensure your safety. It is also recommended that you use headphones with a microphone to minimize audio interference.

At the start of class, please have your audio muted and, *if at all possible*, your video "on". Your display name should be professional, and you are encouraged to also have an appropriate picture as your Zoom profile picture. (Insider tip: "appropriate" does not equal a fancy professionally-photographed headshot, so don't stress over that! However, do avoid extremely casual pictures – such as those that may include red plastic cups, swimwear, *etc.*)

If your circumstances are such that the video feed is *at all* difficult (*e.g.*, unstable internet connection, personal physical surroundings, *etc.*), please know that you are not required to activate your video feed. You may fully participate in class via audio and/or the Zoom chat function; if you have specific concerns, please do not hesitate to discuss them with Dr. Lewis. There are almost always solutions!

**Active Participation:** During the synchronous Zoom class meetings, it will be very important to create the opportunity for everyone to actively and meaningfully participate in whole-class discussions in the main room and small group work in breakout rooms. Different rates of streaming may compromise the timing of individuals who are speaking simultaneously, and it can be challenging to avoid talking over one another in the Zoom classroom, especially during lively and vigorous discussion! Therefore, when you have a question and/or comment in the main Zoom room, please use the Zoom "raise hand" function. Dr. Lewis will acknowledge you, and then you can un-mute your microphone and proceed with your comment/question.

Netiquette: Texas State policy (PPS 4.02) states that disruptive behaviors will not be tolerated in any type of learning environment. Examples of such behaviors include but are not limited to: making loud noises, speaking without recognition, making personal threats or insults, eating or drinking in classrooms, sleeping during class, using electronic equipment prohibited by the instructor or disrespectful of other students, using inappropriate or vulgar language, or taking other actions that others might find offensive, demeaning, or disrespectful.

Any violations of this policy will be dealt with according to TXST policy [UPPS No. 07.10.05, Student Behavior Assessment Team](#). For further guidance, please see [AA/PPS No. 02.03.02 \(4.02\)](#) and [Section 2.02 of Texas State's Code of Student Conduct](#).

**Academic Integrity:** Remote learning also presents a unique set of concerns and issues about academic integrity. Be advised that any compromise or violation of academic integrity will not be tolerated in this course. **This includes the sharing of any course material on third-party collaborative and/or "tutoring" sites (e.g., Chegg, Reddit, social media, etc).**

The [University Honor Code](#) "require[s] all members of this community to be conscientious, respectful, and honest.

More broadly, the practice of science is founded upon principles of honesty, trust, accountability, and respect. Without such a foundation, the entire enterprise would crumble. Therefore, the Honor Code is strictly enforced in this course and any violations will be pursued.

As a reminder of the critical role of academic integrity, you are expected to include the students' pledge on all submitted assignments:

"I pledge to uphold the principles of honesty and responsibility at our university."

Some assignments (in particular, the problem sets and concept maps) are intended to be collaborative. All other assignments, including quizzes, exams, and the literature critique, are to be completed individually, unless you are explicitly otherwise instructed. ***Violation of the honor code will result in academic penalties at the instructor's discretion, up to and including failure in the course.***

**Drop Policy:** Students may drop this course and receive a "W" at any time prior to October 26. at 11:59 pm. Students may fully withdraw from the university by November 19 at 11:59 pm.

**Special Needs Information:** Students with special needs as documented by the Office of Disability Services should identify themselves at the beginning of the semester in order for accommodation to be made. Again, the remote learning situation for Fall 2020 adds new considerations to ODS accommodations. Please consult with Dr. Lewis early in the semester for any and all accessibility issues (e.g., if you have a preferred lecture captioning method, etc.).

**Sexual Misconduct Reporting (SB 212):** Effective January 2, 2020, state law (SB 212) requires all university employees, acting in the course and scope of employment, who witness or receive information concerning an incident of sexual misconduct involving an enrolled student or employee to report all relevant information known about the incident to the university's Title IX Coordinator or Deputy Title IX coordinator. According to SB 212, employees who knowingly fail to report or knowingly file a false report shall be terminated in accordance with university policy and The Texas State University System Rules and Regulations.

**Emergency Management:** In the event of an emergency, students, faculty, and staff should monitor the [Safety and Emergency Communications web page](#). This page will be updated with the latest information available to the university, in addition to providing links to information concerning safety resources and emergency procedures. Faculty, staff, and students are encouraged to sign up for the [TXState Alert](#) system.

**COVID-19 Contingency Plans:** The continuing global pandemic caused by SARS-CoV-2 requires not only that this course be delivered remotely, but also that we institute contingency plans for if/when either the instructor or a student falls ill.

The University requests that all students, faculty, and staff who test positive for COVID-19 or who are identified as a close contact report in [Bobcat Trace](#). This is a secure web application for reporting positive COVID-19 cases and will guide contact tracing efforts at Texas State.

It is vital that we all follow the [Bobcat Pledge](#), including the shared responsibility to practice healthy behaviors and follow the health and safety guidelines, which shows respect for others and helps prevent the spread of COVID-19 on campus and in the surrounding community.

*Instructor gets sick:* The core materials for CHEM 4360 (pre-class lectures and in-class problem sets) will be prepared well ahead of time to buffer any potential delays due to instructor illness. If Dr. Lewis contracts the virus, she will self-isolate and continue to lead the class remotely as long as symptoms allow. In particular, she will continue to host the synchronous class meetings and office hours as scheduled.

If Dr. Lewis' symptoms interfere with her ability to host either the synchronous class meetings or office hours, a substitute faculty will take her place and serve as the synchronous class Zoom host, in-class problem set guide, and provide substitute office hours until Dr. Lewis recovers. The Department of Chemistry and Biochemistry has built a strong system of backup instructors for all courses, and CHEM 4360 has an especially deep bench from which to pull a substitute! The identity of the substitute faculty will depend on when in the semester they are needed, and their own course and personal commitments. (Insider scoop: many of us faculty are backup for multiple courses, and so if multiple faculty or their families fall ill simultaneously, our department is in a highly adaptable position to distribute substitute assignments.) **Take-home message: class will keep going even if Dr. Lewis gets sick.**

*Student gets sick:* All students should follow the [10 Guiding Principles for Health, Safety, and Wellness](#) at Texas State, including the requirement to wear a [cloth face](#) covering and perform a [self-assessment](#) each day before coming to campus. If you are sick, **do not go to school or work**. If you have COVID-19 symptoms, contact your healthcare provider or the [Student Health Center](#) (512-245-2161) for evaluation and testing for COVID-19. The [Student Roadmap](#) contains valuable information regarding safe practices and procedure for successful reopening of our campus. If any illness impacts your ability to participate in this course, contact the [Dean of Students Office](#) with appropriate documentation.

**Take-home message: in most cases, the existing learning opportunities and grading policies for CHEM 4360 are sufficient to handle an illness, including COVID-19, without any additional adjustment.** In extraordinary circumstances, as determined by Dr. Lewis, documentation through the Dean of Students Office will be required before any special allowance can be considered.



**COURSE OUTLINE:**

<b>Class #</b>	<b>Date</b>	<b>Topic</b>	<b>Chapter*</b>	<b>Pre-Class Assignment</b>	<b>In-Class</b>	<b>Post-Class Assignment</b>
1	25-Aug	Introduction	1			
2	27-Aug	Genes to Proteomes	6, 7, 8	Canvas Lecture <i>Canvas Quiz</i>	Problem Set 0: Genes to Proteomes	
3	1-Sep	Chromatin & Genome Structure	9, 10	Canvas Lecture <i>Canvas Quiz</i>	Concept Map 1: Chromatin	<i>Problem Set 0</i>
4	3-Sep	Chromatin & Genome Structure	9, 10	Canvas Lecture <i>Canvas Quiz</i>	Problem Set 1: Chromatin	<i>Concept Map 1</i>
5	8-Sep	DNA Replication <i>Lasker Award</i>	11	Canvas Lecture	Concept Map 2: Replication	<i>Problem Set 1</i>
6	10-Sep	DNA Replication		Canvas Lecture <i>Canvas Quiz</i>	Problem Set 2: Replication	<i>Concept Map 2</i>
7	15-Sep	DNA Replication		Canvas Lecture <i>Article Selections Due</i>	Problem Set 2 cont'd	<i>Problem Set 2</i> <b>EXAM 1 OPENS</b>
8	17-Sep	DNA Mutation and Repair	12	<b>EXAM 1 DUE</b> Canvas Lecture	Concept Map 3: Mutation & Repair	
9	22-Sep	DNA Mutation and Repair		Canvas Lecture <i>Canvas Quiz</i>	Problem Set 3: Mutation & Repair	<i>Concept Map 3</i>
10	24-Sep	DNA Recombination	13, 14	Canvas Lecture <i>Canvas Quiz</i>	Concept Map 4: Recombination	<i>Problem Set 3</i>
11	29-Sept	DNA Recombination <i>Nobel Prize in Physiology or Medicine</i>		Canvas Lecture <i>Canvas Quiz</i>	Problem Set 4: Recombination	<i>Concept Map 4</i>
12	1-Oct	DNA Recombination <i>Nobel Prize in Chemistry</i>		Canvas Lecture	Problem Set 4 cont'd	<i>Problem Set 4</i>
13	6-Oct	Literature Critique: Outlines		<i>Outlines Due</i>	Critique Outline Peer Review	<b>EXAM 2 OPENS</b>
14	8-Oct	Transcription	15	<b>EXAM 2 DUE</b> Canvas Lecture	Concept Map 5: Transcription	
15	13-Oct	Transcription		Canvas Lecture <i>Canvas Quiz</i>	Problem Set 5: Transcription	<i>Concept Map 5</i>

16	15-Oct	Transcription		Canvas Lecture <i>Canvas Quiz</i>	Concept Map 5 revisited	<i>Problem Set 5</i>
17	20-Oct	RNA Processing	16	Canvas Lecture <i>Canvas Quiz</i>	Concept Map 6: RNA Processing	
18	22-Oct	RNA Processing		Canvas Lecture <i>Canvas Quiz</i>	Problem Set 6: RNA Processing	<i>Concept Map 6</i>
19	27-Oct	Transcription & RNA Processing			Concept Maps 5 & 6 Revisited	<i>Problem Set 6</i> <b>EXAM 3 OPENS</b>
20	29-Oct	Translation	17, 18	Canvas Lecture <b>EXAM 3 DUE</b>	Concept Map 7: Translation	
21	3-Nov	Translation <i>Breakthrough Prize</i>		Canvas Lecture <i>Canvas Quiz</i>	Problem Set 7: Translation	<i>Concept Map 7</i>
22	5-Nov	Translation		Canvas Lecture <i>Canvas Quiz</i>	Problem Set 7 cont'd	<i>Problem Set 7</i>
23	10-Nov	Translation		Canvas Lecture	Concept Map 7 Revisited	<b>EXAM 4 OPENS</b>
24	12-Nov	Literature Critique: Presentations		<b>EXAM 4 DUE</b>	Lecture & Discussion	
25	17-Nov	Critique Presentations		<i>Presentations Due</i>	Critique Presentations	
26	19-Nov	Critique Presentations			Critique Presentations	
27	24-Nov	Critique Presentations			Critique Presentations	<i>Presentation Peer Reviews Due</i>
	26-Nov	<i>no class - Thanksgiving Break</i>				
28	1-Dec	Regulation of Gene Expression	19, 20	Canvas Lecture <i>Canvas Quiz</i>	Problem Set 8: Reg'n of Gene Expr'n	
29	3-Dec	Regulation of Gene Expression	21, 22	Canvas Lecture <i>Canvas Quiz</i>	Problem Set 8 cont'd	<i>Literature Critique Paper Due</i>
<b>FINAL EXAM: Combination Format (Canvas Quiz + Take-home)</b> <b>All Components Due Tues 8-Dec at 10:30 am</b>						

\* Listed are the corresponding chapters in the textbook. Additional reading may be assigned during the semester as appropriate for the topic being discussed. Note that the above topics, schedule, and exam content are subject to change as needed. Students will be notified *in class* of any changes.