

## Bi214 General Biology IV: Mechanisms: Fall 2022

This course expands upon the introductory material that was presented in BI 211, as many upper division subjects in Biology necessitate a good working knowledge of genetics (transmission and molecular) and biochemistry (protein structure and function). We will emphasize key experiments, and how biochemists and geneticists design, execute, and interpret them. The first part of the course will be dedicated to an understanding of protein structure, and how that structure governs protein function. We will begin with a study of the properties of amino acids; we will then investigate how amino acids join together to define the primary protein structure, and how portions of the primary structure are folded into a few common functional 3-dimensional themes. Using the oxygen transport molecule hemoglobin as an example, we will then look at how the overall shape and cooperation between regions of a protein affect the protein's function. The biochemistry portion of the class will conclude with a look at DNA structure with the goal of understanding how its structure allows for replication and protein binding. We will also examine how chemical changes to the structure can lead to mutations.

During the genetics half of the course, we will begin with a description of some inherited metabolic errors, and what essential genetic principles were learned from their initial study. After a review of basic genetic principles, we will explore basic tools used by a geneticist, such as phenotypic analysis of mutants to determine a gene's function, and complementation tests and other approaches to determine a mutant's gene identity. Finally, using this knowledge we can explore a simple set of genes in a bacterium to see how genes are turned on and off (how transcription is stimulated or prevented). This can be described as the flipping of genetic switches in response to a cell's needs. We will use the well-studied example of the lac operon, to explore this form of gene regulation.

Bi211 and Bi212, or the equivalent, and a full year of General Chemistry are prerequisites.

### Class Learning Objectives:

By the end of the term, students will be able to:

- provide an overview of the general structure and basic properties of the twenty amino acids
- predict generally and calculate specifically how the charge of an amino acid changes with pH
- explain how protein structure affects protein function by using hemoglobin as an example.
- interpret a binding affinity curve and make prediction about how well a protein binds its ligand
- explain the basic components of DNA's structure, and explain how tautomeric shifts cause mutations.
- describe how steps in metabolic pathways are controlled by genes and how disruption of a single gene impacts the final product, using yeast as an example
- predict the results of a complementation test between two mutants by examining the phenotype of their offspring
- explain how a gene's structure affects the rate of transcription
- explain how activators and suppressors regulate transcription and how that affects cellular pathways, using the lac operon as an example.

### More general skill sets:

- apply high-level problem solving to questions in molecular biology
- consider an experiment in some topics in molecular biology and predict the results
- consider cause and effects, such as the impact a mutation has to a protein's structure or to a metabolic pathway
- perform some basic techniques in molecular biology such as running a DNA gel and plating cultures

### Contact Info

#### **Instructors**

Dr. Connolly (Lecture)  
amyc@uoregon.edu

Katie Pérez (Lab Preparator)  
[kperez@uoregon.edu](mailto:kperez@uoregon.edu)

#### **GEs**

Derek Epiney  
depiney@uoregon.edu

Rose McDonald  
rmcdonal@uoregon.edu

#### **BTUs/BULAs**

Jaiden Eubanks (BULA)    Ciarra Thomas (BTU)  
jaidene@uoregon.edu    ciarrat@uoregon.edu

Rachel Hanson (BULA)    Peter Weisel (BTU)  
rhanson2@uoregon.edu    pweisel@uoregon.edu

Emily Murphy  
[emurphy6@uoregon.edu](mailto:emurphy6@uoregon.edu)

Julia Reinisch  
[jreinsch@uoregon.edu](mailto:jreinsch@uoregon.edu)

Anais Kolesnikov  
(BULA/BTU)  
[anaisk@uoregon.edu](mailto:anaisk@uoregon.edu)  
Thomas Leonhardt  
(BULA/BTU)  
[tleonhar@uoregon.edu](mailto:tleonhar@uoregon.edu)  
Joanna Nielson  
(BTU/BULA)  
[joannan@uoregon.edu](mailto:joannan@uoregon.edu)  
Tyler Ramos  
(BULA/BTU)  
[tramos@uoregon.edu](mailto:tramos@uoregon.edu)

Kaitlyn Wood  
(BULA/BTU)  
[kwood3@uoregon.edu](mailto:kwood3@uoregon.edu)  
Jasmine Wong  
(BULA/BTU)  
[jwong13@uoregon.edu](mailto:jwong13@uoregon.edu)  
Jadelyn Yep  
[jjep@uoregon.edu](mailto:jjep@uoregon.edu)

Dana Zaidan (BTU)  
[dzaidan@uoregon.edu](mailto:dzaidan@uoregon.edu)

## Class Set-Up

### Pre-Class Videos and Quiz:

The lectures for the class will be delivered through pre-recorded videos. You will need to watch them and complete the corresponding module quiz before coming to class. You will be allowed two attempts for these module quizzes, but the first attempt must be completed by 11:59 PM the night before. The second attempt must be completed within one week, after that time the quiz is no longer available to take.

### Class: Monday, Wednesday, Friday 10:00-10:50 am, in 123 Global Scholars Hall

Class time will consist of a brief review from the videos, discussing the module quiz, followed by practice problems that are substantially more challenging, meant to prepare you for the exams.

### Labs (Wed/Thurs (1 hour 50 min) in Klamath 13)

A pdf of the lab handout for the week can be found on Canvas. Among the pages are a series of preparation questions meant to prime you for the upcoming lab. These questions will be mirrored in an associated Canvas quiz that will be due the **night before the lab at 11:59 PM**. Beginning lab 2, the **pre-lab quizzes** will also contain some follow-up questions from the previous week's lab to puzzle through. You are welcome to ask for help during our office hours and work with your peers on this assignment. You must come to lab with a printed version of this pdf to fill out during our time together (printers are available to use with your Duck ID in all residence halls and the UO libraries). These **lab reports** will usually be turned in at the end of each lab. Associated with your lab grade is an attendance, courtesy, and active **participation** component. If you attend lab regularly (and on time), actively participate, and clean-up after yourself you should expect full credit. *Note: There is one lab that will require you to return to the lab two times; see schedule.*

<b>Lab Times</b>	<b>GE(s)</b>	<b>BULA</b>
Wednesday 11:00-12:50 PM	Rose	Tyler (11-12:00)
Wednesday 1:00- 2:50 PM	Rose	Jaiden, Kaitlyn
Wednesday 3:00- 4:50 PM	Julia	Rachel
Thursday 8:00-9:50 AM	Emily	Thomas, Jadelyn
Thursday 10:00-11:50 AM	Emily	Tyler
Thursday 12:00-1:50 PM	Julia	Anais
Thursday 2:00-3:50 PM	Derek	Joanna, Jasmine

## **Exam Policies:**

- **Materials:**  
Exams will be closed book, closed notes. You will need a scientific calculator for at least exam 1 and the final.
- **Make up exams:**  
Unless there is an academic conflict, an emergency, or some unusual extenuating circumstances, make-up exams will not be given. If you miss an exam, that exam will be dropped according to the grading scheme below.

To help prevent the circulation of exams, the exams will not be made available. However you will be allowed to view exams after you have taken them.

## **Office Hours/Help Sessions**

We will have office hours every school/business day. You can find the schedule and room location on Canvas in the first module under "Office Hours."

## **Communication Guidelines**

In order for the teaching staff to effectively help a number of students, please use the following guidelines:

### **I. Lecture Content:**

If you have questions about module quizzes, or problem sets, and content in general, please do the following in the following order.

1. Come to **office hours** or use **slack** to ask a question. (The teaching team will be monitoring it frequently).  
Slack Link for Summer 2022 class here: [https://join.slack.com/t/slack-zrt9151/shared\\_invite/zt-1ga4k30hy-ldDQEJAYDR9tK7pLypc9aA](https://join.slack.com/t/slack-zrt9151/shared_invite/zt-1ga4k30hy-ldDQEJAYDR9tK7pLypc9aA)
2. Email Dr. Connolly

### **II. Lab Content:**

For lab questions specifically, please do the following in the following order

1. Use remaining lab time to work through lab reports, since help is readily available.
2. Use our slack page: [https://join.slack.com/t/slack-zrt9151/shared\\_invite/zt-1ga4k30hy-ldDQEJAYDR9tK7pLypc9aA](https://join.slack.com/t/slack-zrt9151/shared_invite/zt-1ga4k30hy-ldDQEJAYDR9tK7pLypc9aA)
3. Email your GE
4. Email Dr. Connolly

Finally, we will also communicate with you through our Canvas site. Announcements can be automatically forwarded to your UO email, and can even reach you by text. Check and adjust your settings under Account > Notifications.

### **III. Grading Questions**

- A. **Module quiz and exam** grading questions, errors, and requests should be sent to Dr. Connolly, within one week.
- B. Questions about **lab report grades** and **pre/post-lab quizzes** should be directed to your GE. Requests for regrades must occur within one week of receiving the grade.

## Grading Breakdown

Content	Percentage
Module Quizzes (one a day except exam weeks) with lowest two dropped.	10%
Exam 1, Exam 2, Exam 3 and Final (lowest dropped)	54% (18% per exam)
Lab Attendance, Courtesy, & Participation (lowest dropped)	5%
Pre-Lab & Post-Lab (lowest score dropped)	16%
Lab Reports (lowest score dropped)	15%

## Grading Scale

A+	A	A-	B+	B	B-	C+	C	C-	D	F
100 and above	93-99	90-92	87-89	83-86	80-82	77-79	73-76	70-72	60- 69	59 and below

### Notes on Assigning Grades:

- The above grading scale will be used to determine your grades. We may draw any one of these cut offs lower than what's outlined above. We will never draw the cut offs higher than what's above.
- The exact cut offs for grades that are on the cusp (i.e. 92.1-92.9) will vary by year. It depends upon where there are natural breaks in the grade line up. These cut offs won't be made public.
- A + grades are special and are rewarded in cases of outstanding performance. Like the first bullet point mentions, this cut off could be lower than stated above, but this will depend upon the particulars of the class and is up to instructor discretion.
- **At the end of the term do not ask for your grade to be bumped or for extra assignments or extra credit.** I endeavor to make the class fair for everyone, and cannot grant these kinds of requests.

### Philosophy on Grading Structure:

- Module quizzes and lab assignments have high class averages, but the exams tend to be more difficult. Exams you must work on your own, but the assignments can be completed with the help of instructors and other students. It is therefore essential that you come to class and office hours to make sure you are earning these assignment points. Not only are they important for your learning the material, they will serve as a booster for your exam scores if need be.
- After the class has taken an exam, the exam will be evaluated as a whole to see if there were any problems that a number of people missed, and see if we can award some kind of partial or full credit there.
- If an average of at least 70% on the exam is not achieved by the class as a whole, the exam will be curved to at least 70%. Hopefully, you'll all work together and achieve scores as a class higher than that!

## Grading Policies:

**Module Quizzes, Pre/Post- Lab Quizzes and Lab Reports:** Canvas quizzes submitted any time after 11:59 PM of the day its due will **receive a flat 15% deduction** off the total points. Late policies are strict because 1) you need to come to class prepared 2) the answers will be revealed the day after the associated class, and 3) answers for lab quizzes will be discussed in the labs and 4) for the labs it's essential that you have read and thought about the lab prior to coming. Unless otherwise noted, lab reports are turned in the following week at the start of lab. Late labs reports will also receive at flat 15% dedeuction. You have **one week to turn in a late assignment before it becomes a 0.** But the last week of class, everything must be turned in by **Friday December 5 at 11:59 PM.**

Extensions: As much as I would like to help you out as situations arise, we are not offering extensions on assignments (unless a serious emergency arises) for the reasons mentioned above when discussing late policies. Additionally, with such a large class size, these requests become hard to manage. So don't worry too much if you're having a bad day and accrue a late penalty, because 1) you can turn it in late for a **15% deduction** and 2) **your lowest score (lab quiz and lab reports) or two lowest scores (module quizzes) are dropped.**

**Exams:** Requests to examine grading errors or to regrade quizzes and reports must be sent to your Dr. Connolly **within one week** of your receiving the graded assignment for consideration, and must be accompanied by a written explanation.

**Lab Attendance:** Labs are not easily made up because a great deal of prep goes into setting them up and taking them down each week. If you have to miss a lab for some reason, the grading structure is set up so you can drop the lowest grade for each component of the lab (attendance, lab quiz, report).

### **Accommodations for students with disabilities:**

If you have a documented disability and anticipate needing accommodations in this course, please provide Dr. Connolly and your lab instructor with a notification letter from the Accessible Education Center stating your approved accommodations. If you have flexibility on attendance or due dates, it is imperative that you reach out to your instructor early on to discuss an arrangement with how you are going to handle missed days or late assignments.

### **Required Supplies**

- Scientific Calculator
- There is no book this term. Instead we are providing links to open access (Free!) textbooks and other material where it's available in the modules to support your understanding. You can find these in the modules as "Supplemental reading." So if you want to read/learn about the same information from a different source, I'd encourage you to go check these pages out.
- We are providing pdf's of each lab exercise. You must print these out prior to coming to lab.

### **Class Conduct and Academic Honesty**

I expect you to hold yourself to high ethical standards. When students model trustworthy behavior, it makes it easier for me to be more lenient during times when a student may run into a real trouble and need help. It should go without saying that, all work submitted in this course must be your own. Instances of suspected cheating or plagiarism on exams, quizzes, and reports will be referred to the Office of Student Conduct and Community Standards. Your instructors take these cases seriously. Academic misconduct could result in a failing mark for quiz, exam, report or for the course. For definitions of violations, a description of the hearing process, and a summary of penalties for findings of academic misconduct, go to <http://policies.uoregon.edu/vol-3-administration-student-affairs/ch-1-conduct/student-conduct-code>

### **Mental Health Resources**

If you are struggling and need someone to talk to, there are mental health resources available to you as a UO student. Please follow the links here.

<https://counseling.uoregon.edu>

<https://counseling.uoregon.edu/mental-health-resources>

### **Academic Disruption**

In the event of a campus emergency that disrupts academic activities, course requirements, deadlines, and grading percentages are subject to change. Information about changes in this course will be communicated as soon as possible by email, and on Canvas. If we are not able to meet face-to-face for labs, students should immediately log onto Canvas and read any announcements and/or access alternative assignments. Students are also expected to continue coursework as outlined in this syllabus or other instructions on Canvas.

### **Class Schedule**

The topics below are open to change, but the exam times and lab and module due dates will stay constant unless some unforeseen event arises.

## Time Management

Below is an expectation of how much time you will be spending on each part of the course.

Week	Date	Topic
		<b>All module quizzes (unless other noted or announced) are due the night before the class at 11:59 PM</b>
<u>Biochemistry</u> (Weeks 1-5)  1 Amino Acid Introduction and Acid Base Chemistry	Mon Sept 26	<b>No Class</b>
	Wed Sept 28	<i>Pre-Class</i> Module 1-1: <ul style="list-style-type: none"> <li>Video #1: Amino Acid Structure</li> <li>Video #2: Amino Acid Polarity and Solubility</li> <li>Reading</li> <li>Take Module 1-1 Quiz (DUE: Thursday Sept 29 at 11:59 PM; normally due the night before)</li> </ul>
		<i>Class</i> <ul style="list-style-type: none"> <li>Syllabus Overview</li> <li>Review Module 1-1 Quiz</li> <li>Topics in Polarity/Solubility</li> </ul>
	Wed and Thurs Sept 28, 29	<b>No Lab</b>
	Fri Sept 30	<i>Pre-Class</i> Module 1-2: <ul style="list-style-type: none"> <li>Video #1 Acid-Base Chemistry Review</li> <li>Video #2 Acid-Base Chemistry Review Cont</li> <li>Take Module 1-2 Quiz</li> </ul>
<i>Class</i> <ul style="list-style-type: none"> <li>Review Module 1-2 Quiz</li> <li>Concepts and more challenging problems pertaining to Acid/Base Chemistry</li> </ul>		
2 Amino Acid and Protein Chemistry	Mon Oct 3	<i>Pre-Class</i> Module 2-1 <ul style="list-style-type: none"> <li>Video #1: Diprotic Amino Acids</li> <li>Video #2: Amino Acid Charge</li> <li>Video #3: Calculating Charge of Amino Acids</li> <li>Take Module 2-1 Quiz</li> </ul>
		<i>Class</i> <ul style="list-style-type: none"> <li>Review Module 2-1 Quiz</li> <li>Concepts and more challenging problems pertaining to Amino Acid Chemistry</li> </ul>
	Wed Oct 5	<i>Pre-class</i> Module 2-2: <ul style="list-style-type: none"> <li>Video #1: Triprotic Amino Acids</li> <li>Video #2: Polypeptide Properties</li> <li>Take Module 2-2 Quiz</li> </ul>
		<i>Class</i> <ul style="list-style-type: none"> <li>Review Module 2-2 Quiz</li> <li>Concepts and more challenging problems pertaining to Amino Acid Chemistry</li> </ul>
	Wed and Thurs Oct 5, 6	<b>Lab 1: Amino Acids</b> Due: Pre-lab due Tuesday at 10/4 at 11:59 PM; report due at the beginning of your next lab

	Fri Oct 7	<p><i>Pre-class</i> No Module Quiz Due</p> <p><i>Class</i></p> <ul style="list-style-type: none"> <li>• Solidify Amino Acid Chemistry, practice problems</li> </ul>
3 Protein Structure	Mon Oct 10	<p><i>Pre-Class</i> Module 3-1:</p> <ul style="list-style-type: none"> <li>• Video #1: Primary Structure</li> <li>• Video #2: Intro to Secondary Structure</li> <li>• Take Quiz 3-1</li> </ul>
		<p><i>Class</i></p> <ul style="list-style-type: none"> <li>• Review Module 3-1 Quiz</li> <li>• Concepts and more challenging problems pertaining to Protein Structure</li> </ul>
	Wed Oct 12	<p><i>Pre-Class</i> Module 3-2:</p> <ul style="list-style-type: none"> <li>• Video #1: Secondary Structure Cont.</li> <li>• Video #2: Tertiary and Quaternary Structure</li> <li>• Reading</li> <li>• Take Quiz 3-2</li> </ul>
		<p><i>Class</i></p> <ul style="list-style-type: none"> <li>• Review Module 3-2 Quiz</li> <li>• Concepts and more challenging problems pertaining to Protein Structure</li> </ul>
	Wed and Thurs Oct 12, 13	<p><b>Lab 2 Protein Structure</b> Due: Pre-lab/Post-lab due 10/11 at 11:59 PM; report due next lab</p>
	Fri Oct 14	<p><i>Pre-class</i> No Module Videos or Quiz</p>
<p><i>Class</i> Solidify protein structure, practice problems</p>		
4 Hemoglobin	Mon Oct 17	<p><b>EXAM 1</b> Content: Week 1- Week 3: Acid/Base Chemistry, Amino Acid Chemistry and Protein Structure; Lab 1 and Lab 2</p>
	Wed Oct 19	<p><i>Pre-Class</i> Module 4-2:</p> <ul style="list-style-type: none"> <li>• Video #1: Structure and Function in Hemoglobin</li> <li>• Video #2: Oxygen Binding and Conformation Change in Hemoglobin</li> <li>• Reading</li> <li>• Take 4-2 Quiz</li> </ul>
		<p><i>Class</i></p> <ul style="list-style-type: none"> <li>• Review Module 4-2 Quiz</li> <li>• Concepts and more challenging problems pertaining to Hemoglobin</li> </ul>
	Wed and Thurs Oct 19, 20	<p><b>Lab 3 Hemoglobin Cooperativity &amp; Allostery</b> <b>Important! Watch 4-3 Movie before lab!</b> Due: Pre-lab + Post-lab due later than normal: <b>Friday Oct 21 at 11:59 PM</b> Report due following week</p>
	Fri Oct 21	<p><i>Pre-Class:</i> Module 4-3:</p> <ul style="list-style-type: none"> <li>• Video #1: Negative Allosteric Effectors in Hemoglobin</li> <li>• Reading</li> <li>• Take Module 4-3 Quiz</li> </ul>

		<p><i>Class</i></p> <ul style="list-style-type: none"> <li>• Review Module 4-3 Quiz</li> <li>• Concepts and more challenging problems pertaining to Hemoglobin</li> </ul>
5 DNA Structure	Mon Oct 24	<p>No Pre-Class Module</p> <p><i>Class</i></p> <p>Hemoglobin Topics Continued</p>
	Wed Oct 26	<p><i>Pre-Class:</i></p> <p>Module 5-2:</p> <ul style="list-style-type: none"> <li>• Video #1: DNA Structure</li> <li>• Video #2: Discovery of DNA Double Helix</li> <li>• Reading</li> <li>• Take 5-2 Quiz</li> </ul>
	Wed and Thurs Oct 26, 27	<p><b>Lab 4 DNA structure</b></p> <p>Due: Pre-lab/ Post-lab due Tuesday 10/25 at 11:59 PM; report due following week in lab</p>
	Fri Oct 28	<p><i>Pre-Class</i></p> <p>Module 5-3:</p> <ul style="list-style-type: none"> <li>• Video #1: Tautomer Shifts</li> <li>• Reading</li> <li>• Take 5-3 Quiz</li> </ul> <hr/> <p><i>Class</i></p> <ul style="list-style-type: none"> <li>• Review 5-3 Quiz</li> <li>• Continue with topic</li> </ul>
<u>Classical Genetics</u> (Weeks 6-8)  6  Genetics Review  Metabolic Pathways,  Conditional Mutants	Oct 31	<p><i>Pre-Class</i></p> <p>No Module</p>
		<p><i>Class</i></p> <p>Genetics Review</p> <ul style="list-style-type: none"> <li>• Mendelelian inheritance (one and two traits)</li> <li>• Polygenic inheritance (independent and dependent genes)</li> </ul>
	Nov 2	<p><i>Pre-Class</i></p> <p>Module 6-1:</p> <ul style="list-style-type: none"> <li>• Metabolic Pathways</li> <li>• Conditional Mutants</li> <li>• Reading</li> <li>• Take 6-1 Quiz</li> </ul>
		<p><i>Class</i></p> <ul style="list-style-type: none"> <li>• Classical Forward Genetics (Phenotype -&gt; Genotype)</li> <li>• Garrod- one gene-one enzyme</li> <li>• Beadle and Tatum- Mutagenesis</li> </ul>
	Nov 2, 3	<p><b>Lab 5: Conditional Mutants</b></p> <p><i>During this lab you will be required to return once to analyze your plates. Wednesday's lab will return Thursday, and Thursday's lab will return Friday.</i></p> <p>Due: Pre-lab/ Post-lab due Tuesday 11/1 at 11:59 PM; Teport due following week in lab</p>
Nov 4	<p><i>Pre- Class</i></p> <ul style="list-style-type: none"> <li>• Module 6-2: Complementation Tests</li> <li>• Take 6-2 Module Quiz</li> </ul> <hr/> <p><i>Class</i></p> <p><u>Identifying Genotype I (testing for the Known):</u></p> <ul style="list-style-type: none"> <li>• Review 6-2 Module Quiz</li> <li>• Discuss complementation tests as a way to check unknown mutants against known mutants</li> </ul>	



7  Complementation Tests	Nov 7	<b>Exam 2 (Hemoglobin, DNA Structure, Genetics, Metabolics, Conditional Mutants)</b>
	Nov 9	<i>Pre-Class</i> Module 7-2: Complementation Tests <ul style="list-style-type: none"> <li>• Video #1</li> <li>• Video #2</li> <li>• Video #3</li> <li>• Video #4</li> <li>• Take 7-2 Quiz</li> </ul>
		<i>Class</i> <ul style="list-style-type: none"> <li>• Review 7-2 Quiz</li> <li>• Solidify topics in Complementation</li> </ul>
	Nov 9, 10	<b>No Lab: Veteran's Day week</b>
	Nov 11	<b>No Class: Veteran's Day</b>
8  <u>Molecular Genetics</u> (Week 8-10)  Transcription Regulation, beginning of Lac Operon	Nov 14	<i>No Pre-Class Module</i> <i>Class</i> <u>Identifying Genotype II (Determining the Unknown)</u> <ul style="list-style-type: none"> <li>• Brief history (Morgan, Avery-MacLeod)</li> <li>• Gene Mapping</li> <li>• And briefly a look at mapping/sequencing</li> </ul>
	Nov 16	<i>Pre-Class</i> Module 8-2: Transcription in Prokaryotes <ul style="list-style-type: none"> <li>• Video #1</li> <li>• Video #2</li> <li>• Take 8-2 Quiz</li> </ul>
		<i>Class</i> <ul style="list-style-type: none"> <li>• Review 8-2 Quiz</li> <li>• Solidify understanding</li> </ul>
	Nov 16,17	<b>Lab 6 Complementations</b> <i>During this lab you will be required to return to the lab twice. For Wednesday labs, you will signup for times to return Thurs. and Fri. For Thursday labs, you will signup for times to return Friday and Monday. Due: Pre-lab + Post lab quiz due noon 11/3; report due 11/17 or 11/18</i>
	Nov 18	<i>Pre-Class</i> Module 8-3: Lac Operon: Negative Regulation <ul style="list-style-type: none"> <li>• Video #1</li> <li>• Video #2</li> <li>• Reading</li> <li>• Take 8-3 Quiz</li> </ul>
<i>Class</i> <ul style="list-style-type: none"> <li>• Review 8-3 Quiz</li> <li>• Practice problems</li> <li>• Solidify understanding</li> </ul>		
9 Lac Operon	Nov 21	<i>No Pre-Class Module</i> In class, we will practice problems pertaining to the lac operon
	Nov 23	<i>Pre-Class</i> Module 9-2: Lac Operon: Positive Regulation <ul style="list-style-type: none"> <li>• Video #1</li> <li>• Take 9-2 Quiz</li> </ul>

		<p><i>Class</i></p> <ul style="list-style-type: none"> <li>• Review 9-2 Quiz</li> <li>• Practice Lac Operon problems</li> <li>• Combine negative and positive regulation and think about it all together</li> </ul>
	Nov 23, 24	<b>No Lab: Thanksgiving Break</b>
	Nov 25	<b>No Class</b>
10	Mon Nov 28	<p><i>Pre Class Module</i></p> <p>Module 10-1: Gene Regulation: Designing models based on data sets</p> <ul style="list-style-type: none"> <li>• Video #1</li> <li>• Video #2</li> <li>• Take Quiz 10-1</li> </ul>
		<p><i>Class:</i></p> <p>Gene Regulation-using data to determine how genes are controlled</p>
	Wed Nov 30	<p><i>No pre-class module</i></p> <p><i>Class</i></p> <p>Gene Regulation and Review</p>
	Nov 30, Dec 1	<p><b>Lab 7: Lac Operon Lab</b></p> <p>Due: Pre-lab and Post-lab quiz due noon 12/1; lab report due during lab</p>
	Dec 2	<p><b>Exam 3</b></p> <p><b>(Complementation Tests, Transcription in Prokaryotes, Lac Operon, Gene regulation pathways)</b></p>
Finals Week	<p>Exam Window</p> <p><b>Thursday Dec 8</b></p> <p>10:15 am</p>	<p><b>Final Exam is Optional:</b> If you choose not to take it, Exam 1, 2 and 3 will be your averaged score for your exams.(Please see details in Grading).</p> <p><b>*Bring Calculator</b></p>