

Bi214 General Biology IV: Mechanisms

This course is about how stuff works: the mechanisms by which biological processes, practiced by all cellular life, operate. Through a combination of lectures, problem solving, and laboratory exercises we will explore amino acid chemistry, the structures and functions of proteins, the genetics of biochemical pathways, the structure and regulation of prokaryotic and eukaryotic genes, and the genetics and molecular biology underlying development. Bi211 and Bi212, or the equivalent, and a full year of General Chemistry are prerequisites.

Contact Info:

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Class Modules

You will have modules that correspond to each day of your summer class, with the exception of Labor Day and exam days. Please see schedule on the last page. Modules will consist of the learning objectives, reading assignments, video lectures, practice problems and suggested problems sets.

Labs

The labs that you would normally have completed in person have been converted to virtual activities you will walk through in Canvas. These activities are structured in a quiz on Canvas so that you can answer questions as you go. The quizzes have due dates, but no time limits. So you may open them whenever you wish and begin working on them right away. We will have some special office hour times for you to ask questions just about the labs. You are allowed to work with your peers on labs, but your work should still be your own.

Quizzes

There will be two quizzes this term (see schedule on last page for details). You will have a 24 hour window (see details on schedule) to complete a 30-45 minute timed quiz. They will be over lecture material from that week. If you have a problem with the quiz or a question about grading please email Dr. Connolly.

Exams

There will be two exams in this class **Friday August 28 from 10-12:00** and **September 11 from 10:00-12:00**. You must make sure you are present for these times. If you have a problem with the exam or a question about grading please email Dr. Connolly.

Academic Integrity for Quiz and Exams:

Due to these atypical circumstances, you will be taking your quizzes and exams on Canvas unproctored. Therefore you are being asked to follow an honor system for the exams and quizzes. Please take this seriously and know that an incredible level of trust is being given to you to take the exam/quiz from home unmonitored.

We ask that you

- do your own work; work alone and do not receive help from others
- do not share information (screenshots, verbatim words, answers, types of questions) to your peers or other individuals.
- do not receive information from your peers about the quiz.

You may

- use whatever resources that are at your disposal APART from other people! This means, you may use your notes, your textbook, Canvas material, google searches. But be warned, the quizzes and exams are timed so you will want to make sure you are prepared and are not searching for answers. Additionally, the quizzes/exams require critical thinking, so you will again not want to depend upon these resources. The best way to prepare for the exam is to practice problems ahead of time.

Office Hours:

you may join optional conference hours on Canvas to ask questions about any of the module material. To access conference hours, we will use Zoom conference calls on Canvas.

Updates to schedule can be found on the Canvas Page called “Office Hours”

Monday: (except Labor Day)

10:00-11:00: Professor Connolly
 12:00-1:00: Alina Salagean
 5:00-6:00 Starla Chambrose

Tuesday:

1:00-2:00: Starla Chambrose
 4:00-5:00 Alina Salagean
 5:00-6:00 Lincoln Hopkins

Wednesday

10:00-11:00: Professor Connolly
 2:00-3:00: Filadelfia Tadjibaeva
 5:00-6:00 Starla Chambrose

Thursday:

10:00-11:00: Professor Connolly
 1:00-2:00: Starla Chambrose
 4:00-5:00 Alina Salagean
 5:00-6:00 Lincoln Hopkins

Friday (except on Exam 1 and Final)

9:00-10:00: Filadelfia Tadjibaeva

Saturday

5:00-6:00 Lincoln Hopkins

Lab Office Hours: Have Lab Mostly Complete Before Coming!

Lab 1 Protein Structure: Monday 24th

9:00 : Alina, Lincoln
1:00: Filadelfia, Starla

Lab 2 Hemoglobin: Wednesday 26th

9:00 Filadelfia, Lincoln
1:00 Alina, Starla,

Lab 3 Complementation: Tuesday 8th

9:00: Lincoln
2:00: Starla
3:00 Filadelfia and Alina

Lab 4 Lac Operon: Wednesday 9th

9:00 Filadelfia, Lincoln
1:00 Alina, Starla,

Office Hours Etiquette

We will be using Zoom on Canvas. Keep your microphone off when you are listening. Additionally, have your computer connected by ethernet; it may help improve your connectivity during your session.

Guidelines to Help Streamline Getting Your Questions on Content Answered:

Before emailing your instructors with questions over the material, please do the following. Come to office hours, as in person-discussion is the best way to converse about difficult content. Alternatively, you may make use of the discussion board on Canvas. Your instructors will be monitoring it frequently. While you are always welcome to contact me (Dr. Connolly) with content questions, I ask you please try these other avenues as it's more efficient.

Required Supplies

1) Customized text book:

The required book is a customized textbook that incorporates material from *Biochemistry* (Mathews, et al., 4th ed.), *Molecular Biology of the Gene* (Watson, et al., 7th ed.), and *iGenetics* (Russell, 3rd ed.), and includes original material. You can find it at the Duck Store or order it from the Duck Store here:

<https://www.uoduckstore.com/book-search-results?cm=41371>

2) Workbook

- This is normally purchased at the bookstore, but these problems and their answer keys will be found by chapters on Canvas.

3) Scientific Calculator

Grading Breakdown

The breakdown is below:

	Method 1	Method 2
Exam 1	30%	Dropped
Final	40%	70%
Quizzes	15%	15%
Lab Exercises	15%	15%

Grading Policies:

Late Lab reports will be marked 30% off. The reason for such severe penalty is because the answers will be made available for students who submitted it the following day. For Lab 1 and Lab 2, you have up to one week to get in a late lab report. For Lab 3 and Lab 4, you have until September 10 at 11:59 PM to submit a late lab report.

Missed Exams/Quizzes:

If you or a loved one have a medical emergency, a death in the family or some other extenuating circumstances and need to miss a quiz or exam, please let me know immediately.

In such an emergency, a missed quiz will be dropped and the other quiz will weigh more heavily. If the emergency is requiring you to miss Exam 1, your final will be counted more heavily (like Method 2 grading). An emergency that causes you to miss the final, you will need to make private arrangement with Dr. Connolly.

Accommodations for students with disabilities

If you have a documented disability and anticipate needing accommodations in this course, please make arrangements with Dr. Connolly at the start of the term and provide us with a notification letter from the Accessible Education Center stating your approved accommodations.

Class conduct and academic honesty

With this class being conducted remotely, the time is more important than ever that you hold yourself to high ethical standards. 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>

Resources for Remote Learning

<https://remote.uoregon.edu/student>

<https://service.uoregon.edu/TDClient/2030/Portal/Home/>

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

Class Schedule

Date	Topic	Readings
Week 1		
M Aug 17	Module 1-1: <ul style="list-style-type: none"> • Introduction • Amino Acid Structure, Polarity and Solubility 	1-11
T Aug 18	Module 1-2: <ul style="list-style-type: none"> • Acid-Base Chemistry • Acid-Base Properties of Diprotic Amino Acids 	12-28
W Aug 19	Module 1-3: <ul style="list-style-type: none"> • Acid-Base Properties of Triprotic Amino Acids • Polypeptides 	29-34
H Aug 20	Module 1-4: <ul style="list-style-type: none"> • Polypeptide Properties, Primary Structure • Secondary Structure (Alpha Helices and Beta-Pleated Sheets) 	35-40
	Quiz 1 (Modules 1-1 to 1-3 and associated problems) Quiz Availability: Thursday August 20 at 12:00 pm (noon) to Friday August 21 at 12:00 (noon)	
Week 2		
M Aug 24	Module 2-1: <ul style="list-style-type: none"> • Secondary Structure Continued • Tertiary and Quaternary Structure 	16, 41-46 46-51
	Lab 1: Protein Structure Lab Due Monday 24 at 11:59 PM, answers revealed following day for submitted works.	
T Aug 25	Module 2-2: <ul style="list-style-type: none"> • Hemoglobin and Myoglobin: structure/function, binding curve and cooperativity; • Hemoglobin cooperativity, properties of heme 	51-64; 72-75
W Aug 26	Module 2-3: Hemoglobin Allostery	77-78, Table on 80, 81, 87-106
	Lab 2: Hemoglobin Lab Due Wednesday 26 at 11:59 PM, answers revealed following day for submitted works.	
H Aug 27	Review	
FRIDAY Aug 28	EXAMDAY 10:00-12:00 Modules 1-1 through 2-4	
Week 3		

M Aug 31	Module 3-1: <ul style="list-style-type: none"> • DNA Structure, Synthesis • Mutations 	
T Sept 1	Module 3-2: <ul style="list-style-type: none"> • Metabolic Pathways • Conditional Mutants 	
W Sept 2	Module 3-3: <ul style="list-style-type: none"> • Complementation Tests 	107-113
H Sept 3	Module 3-4: <ul style="list-style-type: none"> • Transcription in Prokaryotes 	114-124
	Quiz 2: Module 3-1 to 3-2 and associated problems Quiz Availability: Thursday September 3 at 12:00 pm (noon) to Friday September 4 at 12:00 (noon)	
Week 4		
M Sept 7	Labor Day	
T Sept 8	Module 4-2: Lac Operon: Negative	125-126; 129-137
	Lab 3: Complementation Lab Due Tuesday September 8 at 11:59 PM, answers revealed following day for submitted works.	
W Sept 9	Module 4-3: Lac Operon:	137-140
	Lab 4: Lac Operon Lab Due Wednesday September 9 at 11:59 PM, answers revealed following day for submitted works.	
H Sept 10	Review Session	
FRIDAY Sept 11	EXAM DAY 10:00-12:00 (Comprehensive: Module 1-1- Module 4-3)	