

Biology 110, Sec. 2, Principles of Biology I, Fall 2022

Course overview

Faculty	Peter Zani, Ph.D.
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Lecture	Monday, Wednesday, Friday 12:00–12:50, Science D101
Lab	Mon.–Thur. CBB 160
Additional Help Hours	Mon. 1:00-1:50 pm, Tues. 10:00-10:50 am, Wed. 11:00–11:50, or by appointment as needed

Course description

An introduction to and overview of chemical, molecular, cellular, genetic, and evolutionary processes involved in life on Earth. Basic methods associated with scientific investigation emphasized in lab. This is the first of a two-course introductory sequence meant to prepare students for upper-division coursework in Biology and adjacent fields.

Course goals

- Upon completion of this course, you should be able to:
- Apply knowledge of macromolecules and cellular functions to compare basic principles of inheritance and evolution change at different levels from molecular and cellular to organismal.
 - Apply the scientific method and techniques to answer biological questions, using observation, hypothesis generation, experimental tests, and quantitative analysis.
 - Evaluate and communicate biological information from the formal scientific literature
 - Recognize the relevance of molecular and cellular principles, genetics, and evolution for decision-making, including in your own lives as well as to society as a whole.

Course readings

Campbell Biology, 11th edition (2017), Urry, Cain, Wasserman, Minorsky, and Reece. ISBN 978-0134093413.

Other required materials

Protective lab goggles are required and available for [purchase](#) at the bookstore.

Course evaluation

Your grade in this course will be based on the following components totaling 400 pts:

Attendance	Pre-Discussion Worksheets	In-Lecture Discussions	Pre-Lab Quizzes	Lab Assignments	Term Exams	Final Exam
10	20 (4x5 pts. ea.)	20 (4x5 pts. ea.)	50 (10x5 pts. ea.)	100 (10x10 pts. ea.)	150 (50 pts ea.)	50

Attendance

Your attendance at lecture and in labs is expected. Moreover, attendance correlates highly with success in college classes and students lose roughly 3-4% of their grade each class they miss. I will periodically pass around attendance sheets in class for you to sign, but showing up and participating is a habit developed by responsible students that I hope you will choose.

Discussions

We will periodically discuss scientific literature meant to integrate course material. Assignments will be posted to Canvas. Participation during discussions will be assessed based on a 5-point pre-discussion exercise and a 5-point in-lecture **group exercise** for a total of 40 points (10 %). To receive discussion points you **MUST** submit pre-discussion assignments to Canvas **BEFORE** discussions. Pre-discussions are **individual** exercises to prepare you for the in-person **group** discussion. Discussions should be completed in groups of at least three students; individually-completed discussions will not be accepted (unless as approved make-up assignment). The goal is to work with others to understand certain aspects of each paper, usually a table or figure illustrating some central concept. You should expect that the ideas related to these central concepts will appear on the next exam via additional interpretation questions.

Labs

First, lab attire. I recommend that you wear clothes to lab that you won't mind getting dirty. Lab safety requires that you wear appropriate footwear, meaning shoes that cover and protect your entire foot. Inappropriate footwear includes sandals, flip-flops, or similar options. Likewise, you should wear protective eyewear (goggles) when there is a risk of splashing chemicals other than water. *Failure to comply with lab safety rules will result in your exclusion from lab until you are properly attired.*

Each week there will be a pre-lab video and quiz available on Canvas. The quiz, questions for which will come straight from the video, must be completed prior to lab. Your 10 highest scores on the quizzes will be retained and the

remainder of the quiz scores will be dropped. Likewise, each week there will be a post-lab assignment worth 10 points to be completed by the start of the next lab. Questions for post-lab assignments can be found at the end of each lab. Answers to post-lab questions should be typed in word processing document (e.g., Microsoft Word) with the questions numbered (but not repeated) and submitted to Canvas. Not every question on each lab assignment will be graded. Rather, a representative set of questions (3-4) from assignments will be graded each week. Moreover, not every lab assignment will be graded. Rather, lab instructors will choose 10 lab assignments to grade over the course of the semester. Lab-related communication will make up 37.5 % of your total grade (150 points).

Exams

There are three in-term lecture exams (50 points each; 37.5 % of your grade *each*) as well as a 50 point final take-home exam (12.5 %). Exams will test your mastery of the material and your ability to apply critical-thinking/communication skills. Exams will have questions covering lecture material since the last exam, including in-class discussions, and will be primarily multiple choice, fill in the blank, or true/false questions. Term exams are NOT cumulative, though ideas definitely build in this course. However, the final exam, which is take-home, is cumulative. For the final exam, questions are meant to synthesize knowledge, meaning they lean ***heavily*** on short-answer/essay questions.

Grades

Your final grade is based on the percentage of points that you earn.

≥93% = A, ≥90% = A-, ≥87% = B+, ≥83% = B, ≥80% = B-, ≥77% = C+, ≥73% = C, ≥70% = C-, ≥67% = D+, ≥60% = D, <60% = F

REQUESTS FOR EXTRA POINTS WILL NOT BE HONORED.

Make-Up Assignments

You must make every effort to complete assignments at the scheduled times. MAKE-UP ASSIGNMENTS, INCLUDING EXAMS, MAY BE ALLOWED IN CASES OF MEDICAL EMERGENCY, FOR WHICH YOU MUST PROVIDE ***WRITTEN*** DOCUMENTATION. You must make arrangements with your instructor within 24 hours of the exam to schedule a make-up exam within one week or you will forfeit the points.

- An emergency is a situation where your presence is ***required*** to alleviate extreme suffering (including but not limited to your own), such as contracting Covid-19 from the novel coronavirus.
- Student Health Services does not handle emergencies.
- Scheduled appointments aren't emergencies.
- A good rule of thumb: *If your situation wouldn't cause you to postpone your wedding, then it isn't a good reason to miss a scheduled exam.*

Academic Integrity

Any misrepresentation of your work, including plagiarism, or cheating of any kind will result in a zero (0) for that assignment. Students are encouraged to become familiar with the UWS/UWSP Student Academic Standards and Disciplinary Procedures governing student academic conduct. This is available for download at:

<https://www.uwsp.edu/dos/Documents/UWSP14-Final2019.pdf>

- Copying whole passages written by someone else is plagiarism. Even if you right-click in Word to use the thesaurus and replace some words.
- Cobbling together sentence from various sources and presenting them as your own is plagiarism.
- Quoting passages is not appropriate in this class. Use your own words.

Disabilities

Students with disabilities are welcome and encouraged in this class. Students with disabilities should contact the Disability and Assistive Technology Center during the first two weeks of the semester if they wish to request specific accommodations.

<http://www.uwsp.edu/disability/Pages/default.aspx>

Classroom Conduct

Student and instructor behavior should promote an environment favorable to both teaching and learning. This mainly pertains to creating an environment that will not be disruptive for yourself or others. It is contingent upon you to participate in the required group exercises. In our discussions you are not required to agree with every opinion expressed by your instructors or your peers. In fact, healthy skepticism is expected of any good scientist. However, you must respect the rights of others to hold opinions different from your own. You are expected and encouraged to ask questions in class and participate in discussions. Students that disrespect their classmates and their instructor by disrupting lectures or labs may be removed from online learning environments at the discretion of the instructor. When you are ready to engage in respectful discourse pertaining to your education, you will be welcomed back.

Class Schedule (tentative)

Wk	Dy	Date	Lecture Topic	Lecture Readings	Lab Topic/ Suggested Readings
1	W	Sep. 7	Course introduction and syllabus		No Labs
1	F	Sep. 9	Scientific inquiry & themes	2-24	
2	M	Sep. 12	Chemistry of life	28-41	Scientific investigation (online)
2	W	Sep. 14	Water- and carbon-based life	44-64	
2	F	Sep. 16	Molecules of life	66-87	
3	M	Sep. 19	Organelles	93-112	Measurements and microscopes
3	W	Sep. 21	Cytoskeleton	112-123	
3	F	Sep. 23	Membranes structure	126-141	
4	M	Sep. 26	Metabolism	143-161	Quantitative analyses
4	W	Sep. 28	<u>Discussion 1</u>		
4	F	Sep. 30	Exam #1		
5	M	Oct. 3	Respiration	164-178	Diffusion and osmosis
5	W	Oct. 5	Fermentation	179-184	
5	F	Oct. 7	Photosynthesis	187-207	
6	M	Oct. 10	Photosynthesis	187-207	Enzymes
6	W	Oct. 12	Intercellular communication	212-231	
6	F	Oct. 14	Mitosis	234-250	
7	M	Oct. 17	Meiosis	254-267	Fermentation
7	W	Oct. 19	<u>Discussion 2</u>		
7	F	Oct. 21	Mendel	269-278	
8	M	Oct. 24	Patterns of inheritance	278-290	Photosynthesis
8	W	Oct. 26	Chromosomes	294-311	
8	F	Oct. 28	<u>DNA replication</u>	320-332	
9	M	Oct. 31	Central dogma	335-360	Mitosis and meiosis
9	W	Nov. 2	Central dogma	335-360	
9	F	Nov. 4	Exam #2		
10	M	Nov. 7	Prokaryotic gene regulation	363-368	Mendelian genetics
10	W	Nov. 9	Eukaryotic gene regulation	368-392	
10	F	Nov. 11	<u>Discussion 3</u>		
11	M	Nov. 14	Viruses	396-411	Central dogma and DNA replication
11	W	Nov. 16	Techniques	413-426	
11	F	Nov. 18	Human genome project	440-442	
12	M	Nov. 21	Genomes	442-462	No Labs
12	W	Nov. 23	Genomics		THANKSGIVING BREAK
12	F	Nov. 25	THANKSGIVING BREAK		
13	M	Nov. 28	Theories of evolution	466-469	Analyzing coronavirus data (online)
13	W	Nov. 30	Descent with modification	469-482	
13	F	Dec. 2	<u>Discussion 4</u>		
14	M	Dec. 5	Exam #3		Microbiology and molecular techniques
14	W	Dec. 7	Evolution in populations	484-502	
14	F	Dec. 9	Species	504-521	
15	M	Dec. 12	Phylogeny		Modeling evolution (online)
15	W	Dec. 14	Early life	523-547	
		Dec. 22	Take-home final due 12/22		