

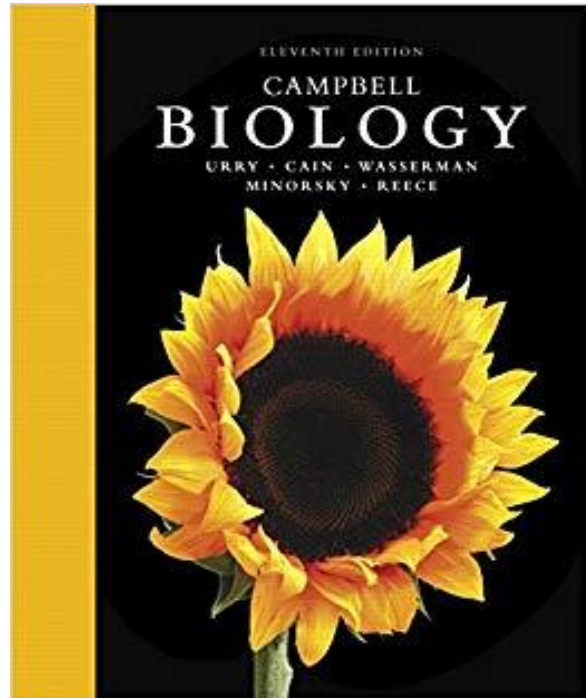
SYLLABUS and SCHEDULE

BIOLOGY 110

Principles of Biology I
Fall Semester 2019
Lecture Section 2

Instructor: Dr. Terese Barta
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Lecture TRF 10:00-10:50 CBB 101
Lab section 1: T 1:00-3:50 CBB 126
Lab section 2: R 1:00-3:50 CBB 126
Office hours MW 9-10, TR 4-5 and by appointment



Course Description: This course covers fundamental principles of biology, including chemistry of life, cell biology, genetics, and mechanisms of evolution. Principles of cell and molecular biology, from macromolecules to organisms, are integrated through an evolutionary framework. Scientific skills necessary to create biological hypotheses, analyze and interpret data, evaluate biological literature, and draw important links between biology and society are integrated throughout the course.

Required materials:

- Textbook:** Campbell *Biology, 11th ed.*, by Urry, Cain, Wasserman, Minorsky, and Reece. 2017. Pearson publishing. (Obtain from DUC text rental)
- Lab Manual** *Biology 110 Principles of Biology I: Laboratory Manual* (purchase from DUC Bookstore). This manual will come in two parts. The second part will be available during the first few weeks of the semester.
- Other:** Safety Goggles for lab (must have side vents). Available from bookstore.

Recommended materials:

- Three-ring binder with loose leaf paper for taking and organizing notes, handouts.
- Permanent marker (black) for labeling lab materials.
- Spiral or bound notebook for recording lab experiment notes.

Peer tutoring: Watch your email for specific information.

Course Site is on Canvas.

Major Topics in Principles of Biology (110):

- Chemistry of Life
- The Cell
- Genetics
- Mechanisms of Evolution
- Scientific methods and techniques

Course Goals:

To introduce students to the fundamental principles of biochemistry, molecular biology, cell biology, inheritance, and mechanisms of evolution upon which other courses will build; to introduce laboratory techniques and procedures, hypothesis testing, and use of data to answer questions in science; and to make connections between biological concepts and society.

Student Learning Outcomes:

1. Apply knowledge of macromolecules and cellular functions to compare basic principles of inheritance and evolutionary change at the molecular, cellular, and organismal levels.
2. Apply the scientific method and techniques to answering biological questions, using formal practices of observation, experimentation, hypothesis testing, quantitative analysis and mathematical reasoning.
3. Evaluate, synthesize, and communicate biological information from the scientific literature.
4. Recognize the relevance of cell and molecular principles, genetics, and evolution, to social decision-making, their lives, and society.

Attendance policies:

It is expected that you will attend and be on time for all the lecture and laboratory sessions. Attendance in lecture will make a difference in your performance on exams. Although no formal attendance taking mechanism will be used in lecture, there will be quizzes at the beginning of each lecture. If you are late or miss lecture for any reason, you will not be able to make up those points. A “get out of quiz free” card cannot apply if you are absent.

Because of tight room scheduling and the preparation time involved in setting up labs, there will be **no make-ups for missed labs** even if you are sick. If you know you must be absent, please check with me ahead of time about the possibility of sitting in during another lab section. More than two unexcused absences will result in lowering of your grade to the next lowest grade (e.g., A to A-, B+ to B, C- to D+, etc.).

Absences due to participation in academically sanctioned events such as athletic events, academic conferences, or music competitions will be considered excused absences if written documentation is provided in advance.

Student Behavior Expectations:

In order to keep the course running smoothly, and to ensure that all students have a good learning environment, I have the following expectations of students in this course:

- Arrive on time, and take your seat promptly, so that the lecture can begin at 10:00. It is rude and disruptive to others to arrive late.
- Please silence your phones and keep them put away during class unless needed for an in-class activity.
- Please keep computers/tablets put away during lecture.
- Please refrain from talking or having side conversations during lecture, unless part of an organized activity.
- If you have a question during lecture, please raise your hand and wait to be called on.

Students who are disruptive may be asked to leave the lecture. Students who exhibit a continued pattern of disruptive behavior may be referred to the Dean of Students.

GRADING:

Your grade is based on the following:

- 1) **Lecture exams** will cover lecture material and assigned readings. Exam format consists of a combination of multiple choice, true-false, matching, fill-in-the blank, and short answer questions. There are three unit exams, each worth 50 points, and covering 10 lectures (including discussion periods). The final exam will be comprehensive and worth 100 points.
- 2) **In-Class Quizzes.** Quizzes will be given at the start of each lecture on material from the previous lecture. In order to do well on these quizzes, it is essential that you **STUDY EVERY DAY**. You are also expected to read the corresponding text chapter before coming to class, with an attempt to understand the material. Each quiz will be worth 2 points. Students absent or late for any reason will **NOT** be allowed to make up these points. Sixty five points will be considered “100%” but you can earn up to 70 points. There may be occasional “get out of quiz free” slips awarded during the semester (at my discretion). These slips can only be used if student attends class (and is on-time).
- 3) **Discussions.** There will be five in-class group discussions in class on assigned outside readings. Each discussion is worth 5 points. Students must complete a pre-discussion assignment **PRIOR TO THE CLASS PERIOD** of the discussion in order to get the five points.
- 4) **Lab Quizzes.** There will be six lab quizzes, each worth 15 points. Quizzes are scheduled about every other week (see schedule). Each quiz will mainly cover the previous two lab periods but there will be one or two questions on the current day’s lab exercise. Again, it is important to keep up lab material. The five highest scores will count toward your grade. If you have to miss a quiz for any reason, it will count as your dropped score. Consult the lab schedule for your section for specific dates of quizzes.

- 5) **Lab Report.** One lab report will be completed on a laboratory exercise (to be announced). The lab reports will consist of an experimental question, a hypothesis being tested, data presented in graphical format (done in Excel and pasted into a Word document) and discussion of the data. Instructions on the report will be posted on Canvas and discussed in class. Though data is shared, students are to write lab reports independently. The lab report is worth 25 points. A late report will receive a 10% per day deduction, unless a valid written excuse is provided.
- 6) **Post-Lab exercises.** At several times during the semester, I will do an unannounced “spot check” to determine if you have completed the post-lab exercises. The percentage of times you have completed the exercises will be used to determine how many points (out of 10) you will receive. For example, if you have a 100% completion rate, you will receive 10 points, 90%, 9 points, etc.
- 7) **Extra Credit.** Because interesting opportunities for learning sometimes come up (visiting lecturers, seminars, special academic events, etc.), I may announce short assignments that will yield up to 5 points of extra credit. This is not a guarantee. No more than 10 points extra credit will be added to your grade. However, I do not offer extra credit assignments to individual students as a means of grade improvement. Everyone’s grade should be based on the same criteria. If you’re having trouble with the material you’re already expected to do, you should not be asking for additional work (especially if you want something “easy” to replace something “hard.”). It is better to concentrate on your study habits and test-taking skills rather than look for an “easy fix.” If you are having trouble in the course, don’t wait-- GET HELP EARLY! Please come see me during office hours to discuss options for improving your grades other than relying on “extra credit” to save you.

I believe in rewarding student learning, even if it occurs on a schedule that is different from my expectations. Therefore, there are elements built into this course that allow you to improve your grade.

Sometimes, students get off to a rocky start. It’s important to identify what is and is not working for you and to make corrections to your study habits if your performance indicates that you’re not succeeding. To motivate you to do that, I will award bonus points for improvements in exam performance from exam to exam, and including the final exam as long as both exams are completed.

- a) For any improvement, you will receive 2 bonus points extra.
- b) For improvements greater than 5% of the total exam score, I will award additional bonus points totaling 50% of the difference between the two scores. For example, if you score 35/50 (70%) on Exam I and 40/50 (80%) on Exam II (10% improvement), you will receive 2.5 bonus points.
- c) If a student’s score on the final exam is higher than their mean exam score on exams I, II & III, the final exam score will replace the average scores of the other exams. (Final Redemption!)

Points Breakdown

Lecture Exams	3@50points	150 points
Final Cumulative Exam	100 points	100 points
Lecture Quizzes	35 lectures x 2 pts (=70 pts)	65 points
Discussion	5 @ 5 points each	25 points
Lab Quizzes	highest 5 of six quizzes	75 points
Lab Report	1@ 25 points	25 points
Post-lab exercises	up to 10 points	10 points
TOTAL		450 points

Grading Scale

> 92% = A	87-89.9% = B+	77-79.9% = C+	67-69.9% = D+
90-91.9% = A-	82-86.9% = B	72-76.9% = C	60-66.9% = D
	80-81.9% = B-	70-71.9% = C-	< 60 % = F

Your grade in this course is percentage of total points possible that you earn. I do not “curve” exams or grades because all students deserve to have achievement standards to that do not depend on the relative performance of classmates. Curving also forces students into certain grade categories, limiting who can get an "A" to only the top 7% of the class, the next 24% to a "B," the next 38% to a "C," etc. This also means the bottom 7% must fail!) Curving also discourages cooperative learning. Finally, I cannot give you a higher grade if you tell me you “worked hard” because I have no way to objectively measure anyone’s perceived level of effort. Please realize that **there are no additional points that can be earned after the final exam**, so please do not email me after the final asking for a way to raise your grade.

Exam Policies:

The following policies will be enforced during exams. Students must sit in alternate seats. Students must stow backpacks, books, and other personal items in the front of the room or side aisles. All materials must be put away before any exams will be distributed. Students must refrain from wearing hats, hoodie sweatshirts with pockets, and bringing water bottles or other beverages. Students may not leave the lecture hall until their exam is turned in (be sure to make use of the rest room before coming in to the exam). Students with wandering eyes will be asked to change their seat.

Attendance at exams is required. Make-up lecture exams will be permitted **ONLY** for unavoidable emergencies provided that you have notified me in advance. If you cannot call, please have someone else call as soon as possible. Acceptable excuses for missing an exam include:

- personal injury, dental emergency, extreme illness or hospitalization, or that of an immediate family member for which you are responsible
- death in the immediate family
- verifiable court appearance or jury duty

Oversleeping is not a valid excuse for missing class, a lab test, or any exam. Neither is purchase of a plane ticket. Please do not ask me to allow you to take an exam early so that you can leave

early for a trip or family vacation. In general, the reasons that you miss an exam should be the same as those for which you would miss a job interview or your best friend's wedding. Make-up exams are difficult to administer, and students usually do poorly on them. Make-up exam format may differ from the original exam. Because of this, it is best to avoid make up exams if you can. However, if you have a valid reason, you may take a make-up exam. In order to qualify for a make-up exam, you must provide a written, verifiable excuse from an authorized party (doctor, dentist, minister, etc.) within five school days of the missed exam. This excuse should clearly articulate that you were UNABLE to make it to class for the exam, including a timetable for restriction from work or school. Except in extraordinary circumstances, make up exams must be scheduled to occur within three days of the original exam and before the exam is handed back to the class.

Grade record

You can use this to keep track of your percentage of points in the course.

EXAMS

Exam I _____/50
 Exam II _____/50
 Exam III _____/50
 Final Exam _____/100
 TOTAL _____/250

DISCUSSIONS

Discussion 1 _____/5
 Discussion 2 _____/5
 Discussion 3 _____/5
 Discussion 4 _____/5
 Discussion 5 _____/5
 TOTAL: _____/25

LAB QUIZZES

Quiz 1 _____/15
 Quiz 2 _____/15
 Quiz 3 _____/15
 Quiz 4 _____/15
 Quiz 5 _____/15
 Quiz 6 _____/15
 TOTAL _____/75
 (5 highest)

LECTURE QUIZZES

2 points per lecture _____/65

LAB REPORT _____/25

Post-lab exercises _____/10

Bonus points _____

TOTAL _____/450 pts (not including bonus or extra credit assignments)

To determine your standing at any point in the semester, divide the points you have earned by the total points possible.

Late policies:

Late assignments will receive a 10% point reduction per day unless a written excuse (and a valid reason) is provided.

Academic Integrity:

You are encouraged to work and study with each other in order to get the most out of the course. Lab experiments also involve working in groups. However, you are expected to work independently on assignments, quizzes, and examinations. All acts of dishonesty in any work constitute academic misconduct. This includes, but is not limited to, cheating, plagiarism, fabrication of information, misrepresentations of a student's academic performance, and abetting any of the above. This includes submitting papers or reports that reflect the work of a group rather than the work of an individual. (Be very careful about this. Although you may work in groups in lab, the written work you submit to me **MUST BE YOUR OWN INDEPENDENT COMPOSITION.**) I will be using Turnitin.com to check for originality. The Academic Standards and Disciplinary Procedures of the University of Wisconsin will be followed in the event that academic misconduct occurs. Students should refer to Dean of Students website for more information: <https://www.uwsp.edu/dos/Pages/Student-Conduct.aspx>. Student academic standards and disciplinary procedures can be found at: <https://www.uwsp.edu/dos/Documents/UWSP14-Final2019.pdf>.

I take academic integrity seriously. So should you. Sanctions for academic misconduct are likely to result in one or more of the following: repeating the test, receiving a zero on the test, a letter of reprimand in your academic file, or a failing grade in the course.

Safe Learning Environment:

UWSP values a safe, honest, respectful, and inviting learning environment. In order to ensure that each student has the opportunity to succeed, we have developed a set of expectations for all students and instructors. This set of expectations is known as the Rights and Responsibilities document, and it is intended to help establish a positive living and learning environment at UWSP. More information is available at: <http://www.uwsp.edu/stuaffairs/Pages/rightsandresponsibilities.aspx>.

Lab Safety:

You will be asked to read and sign a safety agreement the first day of lab. Your signature indicates your willingness to abide by the safety policies of this university. Please be aware that no eating or drinking is allowed in the lab. Also, students must wear closed-toed/closed-heeled shoes in the lab. Even in warm weather, students should also wear clothing that covers the legs to the ankles (unintentional spillage of cultures and chemicals can and does occasionally happen).

General Safety:

See the UWSP Emergency Management Plan at www.uwsp.edu/rmgt for details on how to respond to emergencies including fire, weather, or active shooter situations.

Sign up for Pointer Alerts to receive information about active credible campus emergency situations that pose a threat and require immediate action. Sign up on the Risk Management page.

Disability and Assistive Technology Center:

The Americans with Disabilities Act (ADA) is a federal law requiring educational institutions to provide reasonable accommodations for student with disabilities. For more information about UWSP's policies, visit:

<http://www.uasp.edu/stuaffairs/Documents/RightsRespns/ADA/rightsADAPolicyInfo.pdf>.

If you are registered with the Disability and Assistive Technology Center, please contact me as soon as possible to plan any course accommodations that may be necessary. If you have a disability or temporary impairment but have not contacted the DATC, please call 715-346-3365 or visit 609 LRC to register for services.

Personal Emergencies:

If you anticipate receiving an important call (for reasons like family health issues), please notify me before class. If your family needs to contact you during class in an unanticipated emergency, they should call the biology office at 715-346-4524 or Campus Protective Services, 715-346-3456 (especially after hours).

Success is a Choice!

- 1) **Make learning your top priority.** Even if you have a job outside of school, college is a full-time job. It is your career. Make the most of your tuition dollars.
- 2) **Come to class prepared every day.** Be there in mind as well as body. Don't rely on someone else's notes to learn what was important. You are expected to read the text before coming to class.
- 3) **Take good notes.** The quizzes and exams will be based on your notes, so taking good notes is important. Develop a good shorthand technique that works for you so you can concentrate on what's being said. Leave lots of space for adding and clarifying things during review.
- 4) **Study every day.** Plan on spending at least 1-2 hours per day per hour of class time. Research has shown that people learn better by studying intensively for short intervals frequently, compared to longer periods on a less frequent basis. Study when you are most alert and avoid napping right before studying.
- 8) **Study your notes when they are fresh,** i.e., as soon as possible after class even if only briefly (to get material from short-term memory into long-term memory).
- 9) **Study in an active manner.** Just re-reading notes gives you a false sense of familiarity. Analyze them; quiz yourself, make comparative tables, term lists, one-page summaries, etc. Practice information retrieval. I do not recommend note cards because they fragment information rather than connect it.
- 10) **Study to LEARN, not to just to pass the test.** Trying to study what you think will be emphasized on the test is counterproductive. The more you understand, the better you will do.
- 11) **Put your cell phone away while you are studying.** Texting and calling while studying interferes with your ability to concentrate and learn. There is no such thing as "multi-tasking."
- 12) **Find a study group or study partner.** You can quiz each other and help each other prepare for exams. Explaining things to others helps you understand the material.
- 13) **Spend your time in lab wisely.** Really think about the material in class and try to understand it. Think about the experiment you are doing. Ask questions. Knowledge is something that is built upon, not just acquired. Don't rush through the experiments or look for ways to get out of lab early.
- 14) **Study your lab notes as much as your lecture notes.** Many students mistakenly think lab is a "supplement" to lecture. It is equally important.
- 15) **If you need help, get it right away.** One of the biggest mistakes students make is waiting too long to get help. Please see me right away if you are having trouble understanding the material. I will do whatever I can to help you find the best way to comprehend the subject.
- 16) **Keep a regular schedule, get enough sleep, eat a sensible diet, and stay sober.**
Seriously. An all too common consequence of alcohol use is the inability to keep up on academic responsibilities. Research shows a strong negative correlation between alcohol and grades. Students with D/F averages consume 6.4 more drinks per week than "A" students. And even "B average" students drink an average of 1.1 more drinks per week than A students. A recent sleep study showed that getting 6 or fewer hours of sleep for more than 10 days straight negatively affects the brain as much as going two days without sleep.

Lecture Schedule

(may be adjusted if necessary)

Week	Day/Date	#	Lecture Topic	Reading
1	T 9/3	0	Course Introduction	--
	R 9/5	1	Evolution, the Themes of Biology & Scientific Inquiry	Ch. 1: pp. 2-14
	F 9/6	2	The Chemical Context of Life	Ch. 2: 28-41
2	T 9/10	3	Water & Life, Carbon & Molecular Diversity of Life	Ch. 3-4: pp. 44-64
	R 9/12	4	Structure & Function of Large Biological Molecules I (intro, carbohydrates, lipids)	Ch. 5: pp. 66-75
	F 9/13	5	Structure & Function of Large Biological Molecules II (proteins, nucleic acids)	Ch. 5: pp. 75-87
3	T 9/17	6	A Tour of the Cell I	Ch. 6: 93-108
	R 9/19	7	A Tour of the Cell II	Ch. 6: 109-123
	F 9/20	8	Membrane Structure & Function	Ch. 7: 126-141
4	T 9/24	9	An Introduction to Metabolism	Ch. 8: 143-161
	R 9/26	10	Cellular Respiration & Fermentation	Ch. 9: 164-184
	F 9/27		<i>Discussion 1</i>	<i>TBD</i>
5	T 10/1	11	Photosynthesis	Ch. 10: pp. 187-207
	R 10/3	12	Cell Communication	Ch. 11: pp. 212-231
	F 10/4		EXAM 1 (Lectures 1-10 + Discussion 1)	--
6	T 10/8	13	The Cell Cycle	Ch. 12: 234-249
	R 10/10	14	Meiosis & Sexual Life Cycles	Ch. 13: pp. 254-267
	F 10/11	15	Mendel & the Gene Idea I	Ch. 14: pp. 269-278
7	T 10/15	16	Mendel & the Gene Idea II	Ch. 14: pp. 278-290
	R 10/17	17	The Chromosomal Basis of Inheritance I	Ch. 15: pp. 294-311
	F 10/18	18	The Molecular Basis of Inheritance I (DNA replication)	Ch. 16: 304-319
8	T 10/22	19	The Molecular Basis of Inheritance II (Mutation & Repair)	Ch. 16: pp. 320-332
	R 10/24	20	Gene Expression: From Gene to Protein (Transcription)	Ch. 17: 335-347
	F 10/25		<i>Discussion 2</i>	<i>TBD</i>
9	T 10/29	21	Gene Expression: From Gene to Protein, cont. (Translation)	Ch. 17: 347-360
	R 10/31	22	DNA Tools & Biotechnology I	Ch. 20: pp. 413-431
	F 11/1		Exam II (Lectures 11-20 + Discussion 2)	

10	T 11/5	23	DNA Tools & Biotechnology II (Applications, Bioethics)	Ch. 20: pp. 431-437
	R 11/7	24	Regulation of Gene Expression I (prokaryotes)	Ch. 18: 363-367
	F 11/8	25	Regulation of Gene Expression II (eukaryotes)	Ch. 18: 368-392
11	T 11/12	26	Viruses	Ch. 19: pp. 396-411
	R 11/14	27	Genomes and their Evolution I	Ch. 21: 440-448
	F 11/15		<i>Discussion 3</i>	<i>TBD</i>
12	T 11/19	28	Genomes and their Evolution II	Ch. 21: pp. 448-462
	R 11/21	29	Descent with Modification: A Darwinian View of Life	Ch. 22: 466-482
	F 11/22	30	Evolution of Populations I (Hardy-Weinberg)	Ch. 23: pp. 484-491
13	T 11/26		<i>Discussion 4</i>	<i>TBD</i>
	R 11/28		Happy Turkey Day	
	F 11/29		(No Class)	
14	T 12/3	31	Evolution of Populations II (drift, gene flow, selection)	Ch. 23: pp. 491-502
	R 12/5	32	The Origin of Species	Ch. 24: 5pp. 04-521
	F 12/6		Exam III (Lectures 21-30 + Discussions 3, 4)	--
15	T 12/10	33	History of Life I (early Earth, fossils]	Ch. 25: pp. 523-535
	R 12/12	34	History of Life II (life patterns)	Ch. 25: pp. 535-547
	F 12/13		<i>Discussion 5</i>	<i>TBD</i>

Last day to drop course: Friday, November 8.

Comprehensive Final Exam: Wed, 12/18, 12:30-2:30 pm. No exceptions unless you have three or more exams on that day.

Lab Schedule

Section 1 meets on Tuesdays; section 2 meets on Thursdays.

Week	Dates	Exercise
1	T 9/3 R 9/5	Lab Intro and Lab Safety
2	T 9/10 R 9/12	The Scientific Method (<i>Daphnia</i> Experiment)
3	T 9/17 R 9/19	Use of the Microscope; Cell Diversity
4	T 9/24 R 9/26	Cell Membrane and Osmosis; QUIZ #1
5	T 10/1 R 10/3	Enzymatic Activity
6	T 10/8 R 10/10	Cell Respiration; QUIZ #2
7	T 10/15 R 10/16	Photosynthesis
8	T 10/22 R 10/24	Mitosis & Meiosis; QUIZ #3
9	T 10/29 R 10/31	Transmission Genetics
10	T 11/5 R 11/7	Molecular Genetics; QUIZ #4
11	T 11/12 R 11/14	Molecular Genetics (finish)
12	T 11/19 R 11/21	Gene Regulation (start exercise); QUIZ #5
13	T 11/26 R 11/28	NO LABS: THANKSGIVING HOLIDAY
14	T 12/3 R 12/5	Complete Gene Regulation
15	T 12/10 R 12/12	Population Genetics & Natural Selection; QUIZ #6