



BIOL 1210 Principles of Biology

Fall 2017

Syllabus

This is a **Hybrid course**, which will use a mixture of online, face-to-face, and technology enhanced instruction. You will need reliable computer access and good computer skills. Good navigation skills of Canvas will be expected. This class will have on-line lectures and assignments every week and meet on campus in JTB 310 roughly every other THURSDAY from 3:05pm to 5pm. The first meeting on campus is scheduled for Thursday, August 24th.

Instructor: Dr. Lucas Moyer-Horner (Dr. Horner)
Email: Lucas.M.Horner@utah.edu (direct questions to TAs first)
Office: Biol 103B
Office Hours: By appointment

TA names, office hours, contact info, and office hours: see Canvas

Course Description: This is an introductory course in biology. The course will focus on making its students literate in basic principles of biology. The main focus of the course is to provide the foundation for taking more advanced biology courses. High school biology knowledge will be expected from students. The course will cover multiple areas of biological organization, from tiny atoms and biological molecules to organisms and ecosystems. Students in this course will discover biological patterns, cycles, and properties that are key to the study of life. Students will also use the biological principles and the scientific method to address biological problems.

Time commitment: *Disclaimer: This is an engagement heavy course!* This is a 4CR class thus approximate time commitment will average to 4 hours per week (3hrs online+1hr on site) and according to University of Utah policy 8-12 hours per week of outside study time is expected for each week of the course.

Expectations from students: Online course viewing/reading is expected to be completed by Monday of each week. Students need to be disciplined with viewing online course material, completing assignments on time and staying on track to be successful in this course. All students are expected to attend the on-site workshops.

Textbook: **Campbell Biology, Concepts and connections**, 9th edition, by Taylor, Simon, Dickey, Hogan, and Reece **with Modified Mastering Biology access code**. A customized version of the book with Mastering Biology access code is available for purchase at the University bookstore (starry sky cover). The book and Modified Mastering biology is an absolute must for this course and reading of the assigned textbook chapters is an expectation. Please check canvas for textbook and Modified mastering buying options.

Course Structure:

The hybrid course will be divided into ~2-week modules with the following structure:

Week 1: Read the textbook and view online lectures/videos. Finish viewing/reading for each week by Monday of that week. Complete that week's mastering Biology assignment by midnight on Sunday. Answer brain break Qs as you go along.

Week 2: Read the textbook and view online lectures/videos. Finish viewing/reading for each week by Monday of that week. Complete brain break Qs as you go along, complete mastering Biology assignment for that week by midnight on Sunday. Attend workshop on Thursday from 3pm to 5pm. Take online quiz for the module within one week of the end of the module.

Success in this class hinges on your ability to 1) be disciplined enough to set aside study time every week and 2) maintain focus during those workshop and study times. Below is an example of how you might set aside time on a weekly basis for this class. You might be able to modify and use this to fit your schedule.

Monday: Take quiz on previous week (1 hr) and read the chapter for the upcoming week (1.5 hrs)

Tuesday: Attempt to complete the weekly Brain Break questions without looking at the book or notes (1 hr); View and read online material (2 hrs)

Wednesday: View and read online material (2 hrs); Revisit Brain Break questions using all resources (1 hr)

Thursday: Attend workshop (3 hrs, including travel time)

Friday, Saturday, or Sunday: Complete the online Mastering Assignment (1 hr)

Any time during week: Participate in an online or in-person discussion section and/or online chat and/or get help in the Biology Learning Center (1.5 hrs). You can use Brain Break Qs, lecture material, end-of-chapter Qs from the book, etc., to structure these sessions.

Total time for week = 10-14 hours (depending on if there's a quiz and/or workshop)

Remember, University policy suggests 12-16 hours per week for a 4 credit class. If you can maintain a schedule like the one above, you will greatly reduce the amount of time you need to study or "cram" for exams, you will put yourself in an excellent position for success in the class, but more importantly, you will learn and retain the material more effectively by spreading it out over the course of the week.

There will be 2 mid-term exams and one comprehensive final

The detailed course format is as follows:

1. Required Reading: Students will need to read relevant sections of their textbook before viewing content for each week of a module. Reading assignments for each module will be clearly detailed on the course schedule. It is expected that you will read **BEFORE** viewing lectures and come to on-site workshops AFTER reading and viewing online lectures for that module.

2. Online lecture/videos: All course content for each module will be available online before viewing is expected. For each module, written descriptions, lectures and relevant videos (averaging 3 hrs per week of viewing time) will be posted online. Students are expected to finish viewing all lectures of the module before coming to the on-site workshop. This means that students will have approximately 10 days to finish viewing ~6 hours of online course material.

Each student should stick to a personally convenient but disciplined schedule and **keep up with the reading and viewing** so that the course work doesn't collect and become overwhelming. I advise designating one-hour of online course time every day and plan on studying at least 8 hrs /week outside of viewing time. Answer your brain break Qs as you read and view lectures.

3. Online Mastering Biology assignments: After reading and viewing lecture slides for each week, students will need to complete the online Mastering Biology study assignments that accompany the lectures. These assignments will help students review course material and boost comprehension. Assignments are due by Sunday of most weeks (See schedule for details). At the end of the semester, I will automatically drop your two lowest Mastering assignment grades (including zeroes). The percentile score from all assignments will be used towards the final total. The grading for these assignments is as follows: You have two attempts to answer every question. There are no grade deductions for an incorrect answer in your two-attempt limit or for using a hint. There is **NO** credit given for late submissions. Reworking on assignments after submission is allowed without change in original credit if you want to practice.

Weekly out of lecture time commitment = approximately 30-60 minutes i.e. if you have done the required reading and course content viewing.

Even though it's open book please take these assignments as a test to judge your own learning. That is why I have allowed you two attempts at each question and use of a hint without any grade deductions. The time you take to do these assignments gives me an indication of how much help you are getting from the book. Copying answers from the book will not help you learn and will eventually affect your overall grade in the course.

4. Online quizzes: Students will need to take short online multiple-choice quizzes after finishing each module in the course (see schedule for a couple exceptions). Students will have at least one week after the end of the module to take the quiz and quiz due dates will be posted on the schedule. Students who complete required reading, viewed lecture slides carefully, and did mastering assignments should be able to fare well on these quizzes. Quizzes will be timed and online security features will be in-built. Late

quizzes will not be accepted and there are no make-up quizzes. I will automatically drop your lowest quiz grade (including zeroes).

5. On-site workshops with graded assignments: The online component of the course will be accompanied by an onsite application and problem solving session. Students have to attend these TA + instructor lead sessions twice a month for 2 hours each.

What will we do in the workshops?

A. Each module's course work is accompanied by **brain break questions** that are included in a brain break handout in the module. These brain break Qs carry workshop points and have to be submitted online before a workshop. The purpose of this is to help students focus on important topics while doing coursework and to help with organization of thoughts. It is expected that students will complete brain break Qs as they study and view lectures. Scans of handwritten brain break assignments are acceptable to be uploaded.

B. During workshop, students will work in teams or individually to complete graded **workshop assignments**. The main goal of the workshop is to test student comprehension, help students ask questions, make connections between ideas, and apply information to solve problems. The workshop assignments need to be completed and submitted to the TAs by the end of the workshop.

6. On site exams: There will be three exams: two midterms (100 pts each) and one comprehensive Final (150 points). These exams will be taken on-site during regular workshop time. No exam grades can be dropped. All exams must be taken only on the day of the exam as indicated on the schedule. ***If you are unable to take a mid-term exam due to extenuating circumstances you need to contact your instructor BEFORE the exam to make alternate arrangements.*** The decision to allow a make-up exam is up to the instructor and will be decided on a case-by-case basis. In case of an unexpected illness and you are unable to take an exam a doctor's note will be required for you to take a make-up exam on another day.

Please note that the make-up exam can be an oral+written exam.

7. Bonus points: *Students can earn a few bonus points during the semester. Bonus point assignments/discussions will be provided on canvas or in workshops and can help boost your grade.*

Approximate Point distribution and Grade Calculation

Online quizzes: 80 points: 5x 20 pts, **one drop**

Exams: 350 points: 2x100 points, 1x150, **no drops**

Mastering Biology: 100 points: from percentile grade of all assignments, **two drops**

Brain break+ Workshop assignments: 100 points: from percentile grade of all, **no drops**

Final percentage calculated from a total of 630 points

Final grade will be normalized to the top 5%; i.e., I'll take the mean point total of the top 5% of the class and use that value (e.g. 600) as the new maximum point value for determining grades. This gives everyone a grade boost.

Grade breakdown:

A	100%	to 94%
A-	< 94%	to 88%
B+	< 88%	to 85%
B	< 85%	to 80%
B-	< 80%	to 75%
C+	< 75%	to 70%
C	< 70%	to 65%
C-	< 65%	to 60%
D+	< 60%	to 55%
D	< 55%	to 50%
E	< 50%	to 0%

Course Policies

Attendance & Punctuality: The University expects regular attendance at all class meetings (online and on site). Students are expected to acquaint themselves and satisfy the entire range of academic objectives and requirements as defined by the instructor. Please complete all assignments on time and by the due dates. Please contact a TA for any assignments you might miss, before the due dates. I will try to do my best to accommodate your requests as long as it is sincere and feasible. **Missing more than two workshop sessions without instructor permission will result in an automatic fail grade in the course.** *Make up workshop assignments will only be given in case of a dire illness (doctor's note on letterhead will be required) or some extenuating circumstances (evidence for which has to be provided). Missed workshop assignments need to be completed with a TA within one week of missing the workshop and only one make-up workshop assignment is allowed per student. Any bonus point exercises from workshops will not be available for make-up workshops.*

Late submissions of online assignments: Brain breaks are the only assignment in which late assignments can earn points. For every day late a 10% deduction will be applied. After ten days a grade of 0 will be awarded.

Computer and canvas literacy expectations: *Students are expected to be computer and internet literate to take this course. Canvas navigation skills are also expected.*

Online participation: *Students are expected to log in and check canvas **every day** for posted announcements and assignments. Students are also strongly advised to set up notifications for canvas so they do not miss any important notifications. In order to do well in this course it is critical that students keep up with online course-work.*

Electronic or Equipment Failure: It is your responsibility to maintain your computer and related equipment in order to participate in the online portion of the course. *Equipment or internet failures will NOT be an acceptable excuse for late or absent assignments.*

Electronic Devices in Class: Students are encouraged to bring their primary electronic devices (laptops/tablets) that you use to access the course to the on-site workshops.

Online Classroom equivalency: Discussion threads, emails, and chat rooms are all considered equivalent to classrooms and student behavior within those environments shall conform to the student code. Specifically:

A. Posting photos or comments off topic in a classroom are still off-topic in an online classroom.

B. Off color language and photos are NEVER appropriate.

C. Using angry or abusive language is called flaming and is not acceptable and will be dealt with according to the student code.

D. Do not use ALL CAPS, except for titles since it is an equivalent of shouting online, as is overuse of punctuation marks such as exclamations!!!!!! And question marks?????

E. Course e-mails, e-journals and other online course communications are part of the classroom and as such are University property and subject to the Student Code. Privacy regarding these communications between correspondents must not be assumed and should be mutually agreed upon in advance, in writing.

Rescoring exams or quizzes: If you believe that your score is incorrect, you may submit your exam for rescoring, subject to the following conditions: Exams written in pencil are NOT eligible for re-scoring. If you expect to submit your exams for re-scoring, write your answers in pen. All re-scores must be requested in writing by 7 days after exams are returned back to you. Do NOT write ANYTHING on your exam after return! Exams will not be re-scored if they have been altered in any way (a random subset of exams will be photocopied before they are returned to students). Make a copy of the exam to keep and turn in the original version with your written re-grade request on a separate piece of paper (stapled to your exam). Be specific and use sound scientific reasoning to explain why your answer should have been awarded more points.

Expected Learning Outcomes

Broad objectives:

1) Evolution - *Students will be able to apply the principles of natural selection and mechanisms of genetic change, including trait variation and heritability, to explain the observed diversity of life that has arisen over long-term as well as recent evolutionary time frames.*

2) Transmission, flow, and interpretation of biological information – *Students will be able to apply a knowledge of genetics, signal reception and transduction, and physiological regulation to explain how information is stored, transmitted, and utilized in biological contexts.*

3) Structure and function - *Students will be able to apply knowledge of molecular, cellular, and organismal structures to explain the diverse set of functions – ranging from the subcellular, to behavioral, to ecological – that underlie the remarkable diversity of individual organisms as well as communities of organisms.*

4) Systems - *Students will be able to explain how biological units interact to give rise to emergent properties at multiple levels of biological organization. These interactions range from the cycling of matter and energy at the subcellular, to organismal, to biogeochemical scales, to the interaction and interdependency of organisms, including humans, with their environment.*

5) Ability to apply the process of science – *Students will be able to apply the process of science to identify knowledge gaps, formulate hypotheses, and test them against experimental and observational data to advance an understanding of the natural world.*

6) Ability to explain the relationship between science and society– *Students will be able to evaluate the interactions between biology and society, including the societal impacts of biological research as well as public perception and decision-making about science, and clearly communicate biological concepts and their implications to broad audiences.*

Specific Learning objectives of this course arranged by chapter

Upon completion of this course students will be able to:

Ch1. Explain the definition of biology, life, science, and evolution.

Ch 2. Describe life's underlying chemical composition: electrons, protons, neutrons, atoms, bonds; emergent characteristics of water and pH scale.

Ch3. Describe the molecular basis of life in terms of the four major classes of biological macromolecules.

Ch4. Catalog and contrast the structures that comprise prokaryotic, animal, and plant cells.

Ch5. Describe the cellular basis of energy conversion, enzymatic promotion of chemical reactions, and transport across selectively permeable membranes.

Ch 6. Outline the process of cellular respiration with particular emphasis on the inputs and outputs of each stage.

Ch7. Outline the process of photosynthesis with particular emphasis on the inputs and

outputs of each stage.

Ch8. Draw and describe the roles of cellular reproduction in living cells, including the processes and outcomes of mitosis and meiosis.

Ch9. Explain how genotype controls phenotype in simple Mendelian inheritance patterns and some common variations. Apply these patterns to calculate genetic probabilities.

Ch10. Describe how the structure of DNA relates to its functions of self-replication and the flow of genetic information through the cell.

Ch11. List the various means by which cells can control the flow of genetic information from gene to protein.

Ch12. Describe the techniques and societal implications of gene cloning, DNA profiling, genomics, and human gene therapy.

Ch13. Describe Darwin's theory of evolution, the evidence for evolution, and how populations may evolve through natural selection and other mechanisms.

Ch14. Explain the processes of speciation and macroevolution, and the significance of phylogeny in studying these topics.

Ch 37. Describe energy flow through communities and chemical cycles. Use examples to describe the structure and dynamics of communities and ecosystems.

Ch 38. Discuss the importance of biodiversity. Demonstrate an understanding of the impact of science on society. Use examples to explain how abiotic factors affect the distribution of species and determine the locations and characteristics of Earth's biomes.

University Policies

Course Drop Policy: The drop and withdrawal policy is the same as the University of Utah policy. Contact the registrar or see the academic calendar for more information.

Incompletes: University policy allows assignment of a grade of incomplete (I) if 20% or less of the course work remains unfinished. I will consider assigning an “incomplete (I)” only under EXCEPTIONAL circumstances unrelated to academic performance, and only if a student is passing the course with a C or better when the “Incomplete” is requested.

Wellness: Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student’s ability to succeed and thrive at the University of Utah. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776.

<http://www.wellness.utah.edu>

Academic misconduct: All suspected cases of academic misconduct including

cheating and plagiarizing will be dealt with according to rules in the student code, University policy 6-400(V). By accepting admission to the University you have agreed to abide by the University rules provided to you in the student handbook. Take note of B 2 a, b, and c Cheating and plagiarism are serious offenses and can result in getting a zero on the assignment, failing a class, a note in your record or being expelled. Here is the link <http://www.admin.utah.edu/ppmanual/8/8-10.html>

Compliance with ADA Regulations: The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, Phone (Voice/TDD): (801) 581-5020, email: info@disability.utah.edu. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services. If you would like to request academic accommodations due to a disability, please contact Disabled Student Services. If you have a letter from Disabled Student Services indicating you have a disability that requires academic accommodations, please present the letter to me so we can discuss the accommodations you might need for class.

Accommodations Policy: I do not grant content accommodation requests as the course content fulfills legitimate pedagogical goals.

Addressing Sexual Misconduct. Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

Discrimination and Harassment policies: I have zero tolerance for any Discriminatory or Harassing behavior. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or Office of the Dean of Students, 270 Union Building, 801-581-7066. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS). Please see Student Bill of Rights, section E <http://regulations.utah.edu/academics/6-400.php>

Note: This syllabus is meant to serve as an outline and guide for our course. Please note that I may modify it with reasonable notice to you. I may also modify the Course Schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas under Announcements.

PRINCIPLES OF BIOLOGY, BIOL 1210 (Hybrid) Fall 2017 Schedule

Order of Topics and Reading

Schedule is subject to change. Students will be notified of any changes.

Mastering Biology is due almost every Sunday by 11:59pm. Use grade drops for missed assignments.

<u>DATE</u>	<u>Topics</u>	<u>Read</u>
Module 1	8/21/17– 1/23/17	
Th Aug 24	Meet in class: Introduction to the course (3:05-5:00pm, JTB 310)	
Week 1 8/21 - 8/28	<u>What is Life, Foundations in Biology and the Scientific Method</u> Introduction (<i>post your intro to the discussion board</i>) Properties of Life DNA Evolution and natural selection The process of Science	Syllabus Ch 1 Ch 1 Ch 1 Ch 1
<i>Mastering assignment chapter 1 due Sunday 8/27 by 11:59 pm.</i>		
Week 2 8/28 - 9/4	<u>Chemistry of life</u> Elements, atoms and compounds Chemical bonds Water, pH and buffers	Ch 2 Ch 2 Ch 2
<i>Mastering assignment on chapter 2 due Sunday 9/3 by 11:59 pm.</i>		
Th Sep 7	Module 1 workshop (module 1 brain break online submission before workshop, by 3 pm)	
9/4 - 9/11	<u>Quiz 1 on Module 1, 20 pts</u>	
Module 2	9/4/17 – 9/18/17	
Week 3 9/4 - 9/11	<u>Molecules of life</u> Organic compounds and Macromolecules Carbohydrates Lipids proteins nucleic acids	Ch 3 Ch 3 Ch 3 Ch 3 Ch 3
<i>Mastering assignment on chapter 3 due Sunday 9/10 by 11:59 pm.</i>		
Week 4 9/11 - 9/18	<u>The cell and its workings</u> Introduction to the cell and its macromolecules The Parts of a Cell Cellular transport across membranes	Ch 4 Ch 4 Ch 5

Mastering assignment on chapters 4 and 5 due Sunday 9/17 by 11:59 pm.

Th Sep 21 Module 2 Workshop (module 2 brain break due online before workshop, by 3 pm)

9/18 - 9/25 Quiz 2 Module 2, 20 pts

<u>DATE</u>	<u>Topics</u>	<u>Read</u>
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Module 3 9/18 – 10/2

Week 5 The working cell

9/18 - 9/25	Cellular energy and enzymes	Ch 5
	Cellular metabolism: respiration	Ch 6

Mastering assignment on chapter 6 due Sunday 9/24 by 11:59 pm.

Week 6

9/25 - 10/2	Photosynthesis	Ch 7
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Mastering assignment on chapter 7 due Sunday 10/1 by 11:59 pm.

No module 3 brain break or quiz.

Exam prep: Attend review sessions please. Students focus on Exam prep.

Th Oct 5 Exam 1 (weeks 1 – 6) 100 points, 3:05-5:00pm in JTB 310

Module 4 10/2 – 10/23

Week 7 Cellular reproduction

10/2 - 10/9	Cell divisions	Ch 8
	Cell division: Mitosis and the cell cycle	Ch 8
	Making gametes: Meiosis	Ch 8

No Mastering assignment this week. Prep for exam. Ch 8 Mastering due next week.

10/9 - 10/16 **FALL BREAK (no assignments due)**

Week 8 Inheritance

10/16 - 10/23	Meiosis and Genetic variation	Ch 8
	Mendel's Laws	Ch 9

Mastering assignment on chapters 8 and 9 due Sunday 10/22 by 11:59 pm. This is a longer assignment.

Th Oct 26 Module 4 Workshop (module 4 brain break due online before workshop, by 3 pm)

Exams will be returned

10/23 - 10/30 Quiz 3 on Module 4, 20 pts

Module 5 10/23 – 11/6

Week 9	<u>DNA to Proteins</u>	
10/23 - 10/30	DNA replication	Ch 10
	Transcription	Ch 10
	Translation	Ch 10

Mastering assignment on chapter 10 due Sunday 10/29 by 11:59 pm.

Week 10	<u>Evolution</u>	
10/30 - 11/6	Natural selection	Ch 13
	Hardy Weinberg and allele frequency	Ch 13

Mastering assignment on chapter 13 due Sunday 11/5 by 11:59 pm.

Th Nov 9 Module 5 Workshop (module 5 brain break due online before workshop, by 3 pm)

<u>DATE</u>	<u>Topics</u>	<u>Read</u>
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11/6 - 11/13 Quiz 4 on Module 5, 20 pts

Module 6 11/6 – 11/20

Week 11	<u>Evolution</u>	
11/6 - 11/13	Speciation	Ch 14

Mastering assignment on chapter 14 due Sunday 11/12 by 11:59 pm.

Week 12	<u>Evolution</u>	
11/13 - 11/20	Origin of life and microbial evolution	Ch15,16

Mastering assignment on chapters 15 & 16 due Sunday 11/19 by 11:59 pm.

11/20 - 11/27 Quiz 5 on Module 6, 20 pts

Module 7 11/20 – 12/7

Week 13	<u>Cycling of nutrients and energy</u>	
11/20 - 11/27	Food webs and the carbon cycle	Ch 37

No Mastering assignment this week. Prep for exam. Ch 37 Mastering due next week.

No module 7 brain break or quiz.

Exam prep: Attend review sessions please. Students focus on Exam prep.

Th Nov 30 Exam 2 (weeks 7 – 12) *No Module 7 material* 100 points, 3:05-5:00pm in JTB 310

Week 14	<u>Conservation Biology</u>	
11/27 - 12/7	Population Ecology	Ch 38
	Preserving Biodiversity	

Mastering assignment on chapters 37 & 38 *due Wednesday 12/6* by 11:59 pm.

12/7 Last day of classes

FINAL EXAM: Thursday, Dec 14, 3:00-5:00pm, location TBD, 150 pts

(100 points comprehensive and 50 points from Module 7)

TA review sessions will run on campus on weekdays before each exam at multiple times. See canvas notifications.