



DON'T PRINT YET.
WE NEED TO VOTE ON TA DISCUSSION TIMES
SYLLABUS for BIOL 1210 Principles of Biology
Spring Semester 2019
BIOL 1210-002 ASB220 11:50am-1:45pm

Renée Dawson, Ph.D.

Email: dawson@biology.utah.edu

Office Hours: JTB 335, Monday and Wednesdays 2 -3 pm, or by appointment

Your questions and comments are always welcomed. *Don't wait until just before an exam to seek help!* When you email me, make sure to write something informative in the subject line. For example you could write "Urgent- Biol 1210 E1 early". Blank subject lines go to the spam folder. Make sure your full name and Biol 1210 are in the email message. *Canvas emails are not as easy to manage and get delayed so please use my biology.utah.edu address.* The only email question that I will not answer is "What did you cover today? Or I missed class yesterday, did you say anything important?" For these queries, post to discussion board and ask your peers how far I got and if there were any reminders/announcements. Feel free to come visit to talk about how to study or any biology topic, **BUT I will not make appointments for the last week of class to "discuss your grade"**. There is nothing to be done about grade outcomes during the last week of school except to study hard for the final. I do not give extra credit to individuals. Work every day to avoid stressing about your grade at the end.

Required Materials

Campbell Biology Concepts and Connections (9th edition) by Taylor, Simon, Dickey, Hogan, and Reece with Modified Mastering Biology access code. A much more affordable customized version of this book with Mastering Biology access code is available for purchase at the University bookstore (it says 3rd custom edition for University of Utah and has a black cover with a starry sky). Mastering Biology assignments and reading of the assigned textbook chapters are required. Other options for buying Modified mastering access will be discussed on day one and are on canvas in the "Getting Started" Module.

Course Description

This course introduces the workings of life from the molecular to the ecosystem level. Topics include introduction to molecular and cellular biology, energy metabolism, genetics, information flow, evolution and ecological interrelationships. This is a preparatory course intended for all life and health science students. Physical/Life Science Exploration. Lecture/Discussion, 4 credits

Teaching and Learning Methods

This course incorporates and expects 3 components: Pre-class work, In-class work including quizzes and exams, and Post-class study plus Assigned Study Questions.

Pre-class (expected time of approximately 2 hours per week): Will include assigned readings and on-line Mastering Biology questions for each chapter. These assignments will be posted on the MyLab and Mastering tab on canvas. The best practice is to do mastering BEFORE lecture but I will ease you into this. The first 4 are due after lecture. Assignments are due by Sunday midnight (see calendar on home page of mastering). The 100 class points that are used toward your final grade are calculated as your total mastering points earned divided by (total mastering points available minus 100). This allows everyone to miss 100 mastering points out of the approximately 1000 available and still get full credit. You have two attempts to answer every mastering question. There are no grade deductions for an incorrect answer in your two-attempt limit or for using a hint. If you want to practice, reworking assignments after submission is allowed without change in original credit. **There is NO credit given for late submissions. No extensions. No exceptions.**

In-class: (4 hours per week): The in-class component will be a traditional lecture classroom plus clicker questions, some of which require discussion with your peers. It is important to keep current on reading and to come to class prepared to actively listen and take notes including question and confusions you may have. I will select and emphasize material that will help you build a framework for biological literacy. Lectures will include abstract principles and concrete examples to illustrate and help you make sense of those concepts. These examples are not "tangents" nor are they the only important details you need to know. The goal of lecture is to coach you through your reading and studying, not to repeat everything that is in the text. Lecture slides are posted on canvas before class. Viewing slides online is not a substitute for attending class. I encourage you to bring a notebook and pen to class with which to take handwritten notes. Studies show that taking notes during a presentation increases comprehension and retention, and taking notes by writing (rather than typing) is the most effective method. Quizzes and exams will be in class.

Post-class (approximately 6 to 10 hours per week): Students are expected to review class-notes, re-read the chapter review page, and then do the Assigned Study Questions (ASQ). This step is crucial to succeeding in the course. The **ASQ** will help you learn the material and prepare for quizzes and exams. You do not need to turn in these questions but you need to DO them-hopefully several times on the hard questions. Don't just look over the key. This gives you a false sense of understanding and has been the downfall of many students. After you put your best effort into doing the ASQ, go to discussion and ask for help on the problems that were challenging for you. I promise that these were challenging for others too and they will be glad you asked. Don't just sit in discussion and passively let the TA show you how to do the problems. It is almost impossible to do well on quizzes and exams without doing ASQ. Think of these as your practice exams. Practice retrieving information from your brain (at least three times). I will post more study advice on Canvas and at the end of this syllabus.

Teaching Assistants

You are free to go to **any, all or none** of the discussions for this class. Contact TAs via Canvas to ask them concise questions* or to set up an individual or small group meeting (at their convenience, TA can do one hour a week of office hour/tutoring for free). Please dig into the ASQ before you come to discussion so you can ask informed questions. You rob yourself of learning opportunities if you passively sit and have someone show you how to answer these questions.

** Instead of emailing the TAs, it is more efficient to post questions to the discussion board so your peers can answer. The TAs and I will monitor the discussion board to make sure information is accurate, or to answer if no one else does. Student who answer their peer's questions benefit the class as a whole but also benefit themselves because they have clarified the concept in their own heads, and I notice their names for consideration as future TAs! 😊*

DISCUSSION TIMES

ROOM

TA

We will vote on discussion times Wednesday

BIOLOGY LEARNING CENTER in atrium space outside BIOL room 103.

Free drop in tutoring. For more information see [BLC website](#) Bring your ASQ

Course Policies

Rescheduling exams: Exams can only be rescheduled in extenuating circumstances, and only by arranging with the instructor at least one week in advance. The only exceptions to this policy are for severe medical-related issues (with doctor's written verification) or legal-related issues (with police documentation). Make-up exams will either be written or oral exams, at the instructor's discretion.

Regrading exams: Do NOT write ANYTHING on your exam after return until you have checked for errors! Exams will not be re-scored if they were taken in pencil or have been altered in any way, suspicion of alterations will be checked against a random subset of photocopied exams. All requests (for math or grading errors) must be made within seven (7) days of the exam return, with an attached sheet fully explaining your reasoning. If you believe there was an error in grading, fully explain why your answer is correct. Note that we cannot grade your unwritten thoughts, only the answers you have written. Note that the instructor reserves the right to fully re-grade your exam, and your score could either go up or go down.

Attendance & Punctuality: The University expects regular attendance at all class meetings. Students are expected to acquaint themselves and satisfy the entire range of academic objectives and requirements as defined by this syllabus. Please complete all assignments on time and by the due dates.

Equipment Failure: It is your responsibility to maintain your electronic equipment in order to participate in the course assignments. Computer loss/theft/crashes or *the dog ate my smartphone* are NOT acceptable excuses for missing assignments. Back up your files! Remind your friends to backup their files.

Computer and canvas literacy expectations: Students are expected to be computer and internet literate to take this course. Canvas navigation skills are expected. For Canvas orientation see <https://utahtacc.zendesk.com/hc/en-us/articles/205654094> Call 581-4000 for CIS help or bring your laptop to Knowledge Commons on second floor of Marriott Library for help. As will be explained in class, sometimes more than one browser is needed for mastering assignments. Post technical issues to the discussion board and we will crowd source the issues when they arise.

How to study: Biology is not suited to rote memorization. "Facts" are meaningless without the context of the procedures and patterns of thought that characterize this science. Thinking scientifically takes practice, and **active** reading, listening, and problem solving are good practice. Many students learn best in interactive contexts, so please create informal study groups outside of class. You will learn, understand and retain *much* more if you have good study habits starting NOW. The University recommends 2-3 hours of study outside of class for each credit hour. That means **8-12 hours per week** for this class. Keep your notes and handouts in order. Learning biological terms is like learning a new language; keep a vocabulary list and look up definitions promptly. Write questions and look for 'big picture' patterns. Keep asking yourself "What is the main concept?" Chapter summaries will help you identify main concepts. Read them before and after chapter. Compare and contrast the information. Try outlines and concept maps. Don't get buried in the details-most are meant to support main concepts (more on this in Lecture 2). This course has amazing breadth; **DO NOT TRY TO CRAM!** Read the link in the How to Study module on Canvas.

Biol 1210-002 S'19 Course Schedule

Readings refer to the pages of the Campbell Biology text that should be read before class. Order of Topics and Reading (Quiz, Exam and Due dates are set, but Lecture topic dates are approximate. I will go in order but might get behind and have to skip some. See Mastering tab in Canvas and then Mastering Home Page for Mastering Biology (MB) assignments. [See MB due dates in blue, no extensions.](#)

<u>Date</u>	<u>#</u>	<u>Topic</u>	<u>READ before class</u>
M Jan 7	1	Introduction	
	1	How to Study	
W Jan 9	1	How to Study	
	1	How to Study	
S Jan 13 MB due			
M Jan 14	☺	<i>Martin Luther King Day</i>	
W Jan 16	2	Doing science	1
	2	Properties that Unify Life	1
F Jan 18 last day to drop			
S Jan 20 MB due			
M Jan 21	3	The Chemistry of Life: Atoms	2
	4	The Chemistry of Life: Bonds	2
W Jan 23	5	The Chemistry of Life: Bonds	2
	6	The Chemistry of Life: Polarity	QUIZ 1 2
S Jan 27 MB due			
M Jan 28	7	The Chemistry of Life: Water	2
	8	The Chemistry of Life: pH	2
W Jan 30	9-10	Macromolecules: Proteins and Nucleic Acids	3
	11	Macromolecules: Carbohydrates and Lipids	QUIZ 2 3
S Feb 3 MB4 due			
M Feb 4	12	Cells: Cells: Sizes and types	4
	13-14	Cells: Organelles for Protein Production	4
W Feb 6	15-16	Transport across Membranes	5
	17	Energy and ATP	QUIZ 3 5
S Feb 10 MB5 due			
M Feb 11	18	Energy and Enzymes	a#1 due 5
	19-20	Cellular Respiration: Redox, Glycolysis and Krebs	6
W Feb 13	21	Cellular Respiration: Electron Transport Chain	6
	22	Cellular Respiration: Electron Transport Chain	QUIZ 4 6
S Feb 17 MB6 due			
M Feb 18	☺	<i>President's Day</i>	
W Feb 20	!!!	EXAM I (Lectures 1-11, Chapters 1-6)	no phones

S Feb 24 MB due				
M Feb 25	23	Photosynthesis: Light Cycles		7
	24	Photosynthesis: Carbon Fixation		7
W Feb 27	25	Chromosomes and Cell Cycles		8
	26	Cell Division: Mitosis	QUIZ 5	8
S Mar 3 MB due				
M Mar 4	27	Making Babies: Meiosis	a#2 due	8
	28	Making Babies: Meiosis		8
W Mar 6	29	Mendel and Meiosis		9
	30	Mendel's First Law	QUIZ 6	9
F Mar 8 last day to W				
March 11-15 ☺ SPRING BREAK (no class, no discussion)				
S Mar 17 MB due				
M Mar 18	31	Mendel's Second Law		9
	32	Mendel's Second Law		9
W Mar 20	33	Human Genetics		9
	34	Human Genetics	QUIZ 7	9
S Mar 24 MB due				
M Mar 25	35	Variations on Mendel	a#3 due	9
	36	Variations on Mendel		9
W Mar 27	37	DNA Structure		10
	38	DNA Replication	QUIZ 8	10
S Mar 31 MB due				
M Apr 1	39	Transcription and RNA processing		10
	40	Translation		10
W Apr 3	41	Translation	10 ? due	10
	42	Regulating Gene Expression	EC2 due QUIZ 9	11
M Apr 8	!!!	EXAM II (Lectures 23-42 Chapters 8-10)		need calculator, no phones
T Apr 9 MB due				
W Apr 10	43	Regulating Gene Expression		11
	44	<i>Recombinant DNA Technology</i>		12
S April 14 MB due				
M Apr 15	45	Natural Selection	a#4 due	13
	46	Natural Selection		13
W Apr 17	47	Microevolution: Allele Frequency		13
	48	Macroevolution: Speciation	QUIZ 10	14
S Apr 21 MB due				
W Apr 22	49	Food Webs		37
	50	Biogeochemical Cycles		37
W Apr 24	51	Population and Community Ecology		37
	52	Biodiversity		38
F Apr 26 !!! EXAM III COMPREHENSIVE FINAL (Lectures 1-52)				
Final is 10:30am-12:30pm in same classroom				
no phones, bring a calculator, two number 2 pencils and an eraser				
S Apr 27	EC 3 due and Project due. After Apr 28 worth zero.			

Course Grading Policy

Course grade will be determined by percentage of total points. Cumulative scores of 90%, 80%, 70% or 60% will guarantee grades of not less than A-, B-, C- and D- respectively. No curve but I will give extra credit for each exam. Total course points will be **650** if the clicker score helps your grade, or **550** if you skip or drop your clicker score.

Exams 300 points - Two midterm exams and one comprehensive final (100 points each). Taking early can be prearranged with one week notice. **ABSOLUTELY** no late makeup exams unless the absence is unexpected, serious and documented.

Quizzes 100 points – Ten quizzes (12.5 points each) will help assess your comprehension and help you to stay current between exams. **Absolutely no early or late quizzes.** Instead everyone can drop their two lowest scores.

Articles 20 points – You will read FOUR articles about biology from Scientific American. For each you will write a summary and five great questions. Approved topics and detailed instructions *will be* on Canvas.

Project 30 points - A list of at least 10 well worded, specific questions addressing areas that you are curious about, and a four page "*exploration*" on one of the questions. Additional details *will be* listed on Canvas.

Mastering online assignments 100 points – In canvas, click on MyLab and Mastering to left. Click on any blue link and you have a choice of registering the code that came with you text, buying an access code for \$65 or signing up for 14 day free access. **REQUIRED ASSIGNMENTS** are posted every week and are due Sunday at 11:59pm. There is no grace period for mastering so pretend that they are due Saturday midnight.

TP clicker 100 points – *Optional but recommended.* In class questions will be given almost daily with Turning Point clickers RF keypads (clickers) to encourage active participation. Questions may review previous lecture or highlight reading material for that day. From within our Canvas class go to Modules, Getting Started and then **CLICK HERE** for Clicker Registration and enter your Device ID number and license number.

University of Utah Policies

Drop, Withdrawal or INC: The University of Utah drop and withdrawal dates are on the class schedule. Also see <http://registrar.utah.edu/academic-calendars/index.php> University policy allows assignment of a grade of incomplete (I) if 80% or more of the course work has been completed. I will consider assigning an "incomplete (I)" only under **EXCEPTIONAL** circumstances **un**related to academic performance, and only if a student is passing the course with a C or better when the "Incomplete" is requested.

Disability accommodations: 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 this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581-5020. CDS will work

with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

Discrimination and Harassment policies: The University of Utah has zero tolerance for any Discriminatory or Harassing behavior. 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. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS). For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776.

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>

MUSE Project: Do you want to learn about research, community engagement, or other opportunities at the U? Check out <http://muse.utah.edu/>

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 helpful resources contact the Center for Student Wellness; www.wellness.utah.edu; 801-581-7776.

Students Success Advocates: SSA will help you explore and clarify your interests and goals, and overcome personal and academic challenges. 801-587-8556, studentsuccess@utah.edu, <http://studentsuccess.utah.edu/advocates-home/>

Code of Student's Rights and Responsibility
<http://www.regulations.utah.edu/academics/6-400.html>

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, science, and evolution. Describe the properties of Life. List the steps of the scientific method
- Ch 2:** Describe life's underlying chemical composition: electrons, protons, neutrons, atoms, bonds; emergent characteristics of water and pH scale.
- Ch 3:** Describe the molecular basis of life in terms of the four major classes of biological macromolecules. Recognize pictures of each monomer type, and know an example and function for each macromolecule
- Ch 4:** Compare and contrast the structures that comprise prokaryotic, animal, and plant cells. Describe the path of protein production in an animal cell.
- Ch 5:** 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.
- Ch 7:** Outline the process of photosynthesis with particular emphasis on the inputs and outputs of each stage.
- Ch 8:** Draw and describe the roles of cellular reproduction in living cells, including the processes and outcomes of mitosis and meiosis.
- Ch 9:** Explain how genotype controls phenotype in simple Mendelian inheritance patterns and some common variations. Apply these patterns to calculate genetic probabilities.
- Ch 10:** Describe how the structure of DNA relates to its functions of self-replication and the flow of genetic information through the cell.
- Ch 11:** List the various means by which cells can control the flow of genetic information from gene to protein.
- Ch 12:** Describe the techniques and societal implications of gene cloning, DNA profiling, genomics, and human gene therapy.
- Ch 13:** 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.

Broad learning objectives for core concepts in Biology

- **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.
- **Transmission, flow and interpretation of biological information** Students will be able to apply a knowledge of genetics, gene expression, growth and development, signal perception and transduction, and physiological regulation to explain how information is stored, transmitted and utilized in biological contexts.
- **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 ecological – that underlie the remarkable diversity of individual organisms as well as communities of organisms.
- **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.
- **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.
- **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.

WEB sites for further exploration:

- <https://www.khanacademy.org/science/chemistry> chemistry tutorials
- <https://www.khanacademy.org/science/biology> biology tutorials
- <http://biology-pages.info> (GREAT online biology text, **bookmark it!**)
- <http://learn.genetics.utah.edu> (Great web site for aN overview)
- <http://www.biology.arizona.edu/site.html> tutorials for Meiosis and Mendel are good
- <http://www.ncbi.nlm.nih.gov> (National Center for Biotechnology Information)
- <http://www.accessexcellence.org> (The National Health Museum, News and Timelines)
- <http://earthtrends.wri.org> (World Resources Institute, Earth Trends)
- <http://tolweb.org/tree/phylogeny.html> (Tree of Life -- good, up-to-date information)
- <https://www.youtube.com/user/grossscienceshow> Gross and fun

How to Get the Most Out of Studying - Video series

by Professor Stephen L. Chew, a cognitive psychologist at Samford University

This is a very good resource for undergraduate students that discusses common misconceptions about learning and how to study effectively. This is a series of 5 videos, each about 7 minutes.

If link is not active paste this into your Browser:

<https://www.youtube.com/playlist?list=PL85708E6EA236E3DB>

If you find other good web sites, please share them on the discussion board.