THE UNIVERSITY OF UTAH

Spring Semester 2020 SYLLABUS for
Biology 1610-002 Fundamentals of Biology I
Monday and Wednesday 11:50 am to 1:10 pm in ASB 220

This course introduces the workings of life from the molecular to the multi-cellular level. Topics include molecular and cellular biology, energy metabolism, genetics, information flow, and cell signaling in development. We will use active learning- a form of evidence-based teaching strategy that directly involves the students in the learning process. Data show that active learning strategies significantly enhance student learning. Student participation both inside (in learning activities) and outside the classroom is essential. This course is part of a four-course sequence, which includes 1620 (focusing on evolution, physiology, and ecological interrelationships), and two labs, 1615 and 1625. 3 credits

Instructors

Instructor: Drs. Naina Phadnis and Renée Dawson

Office Hours: We are happy to meet with you after class or by appointment.

Email: dawson@biology.utah.edu Set up an appointment or ask quick questions by email. Please do not email through Canvas. Use the email address provided for your course coordinator. Put Biol 1610 in the subject line so your email can be given preference. Please give me 24 working hours to respond.

Study Hall and Class Help: A designated and marked space in the Biology learning center (first floor of biology building) is our Study Hall. Students are encouraged to meet there to work on course assignments. This course offers Teaching Assistants (TAs) as well as Learning Assistants (LAs). TAs and LAs are undergraduate students who, through the guidance of weekly preparation sessions and a pedagogy course, facilitate discussions among groups of students that encourage active engagement, uncover misconception, and overcome content hurdles. They can help you with all course assignments and class concepts. They will not simply “give you the answer”. They will instead direct and empower you to figure out the answer on your own. TAs and LAs Study Hall times will be posted on canvas and in the study hall area. Students can also use that study hall space whenever the building is open to study and complete assignments. Please click on the link on the Canvas home page to access all LA/TA times and resources available to you.

Required Materials

Textbook: Biology, How Life Works, **Third Edition**, 2019. Authors: Morris J, Hartl D, Knoll A, Lue R, Michael M. Publisher: Macmillan Education. **The book subscription is included in your registration cost unless you opted out.** This cost includes 2-years access to the E-book with Launchpad learning software and a 12-month subscription to iClicker software with the Reef App. Instructions on how to connect to Launchpad and iClicker Reef can be found on the Canvas home page. Please click on the GET STARTED Link on the canvas home page to access these instructions. Help will also be provided on the first day of class.

Electronic Device: Students are encouraged to bring their primary electronic device (laptop/tablet/smart phone) to access course content and to participate in course activities. Do not use those devices in class for non-course related activities because it disrupts the class. The instructor has the right to ask you to leave the classroom for such behavior.

Course Structure

This course uses Canvas to guide student learning through three components: Pre-class, In-class and Post class work. Please click on the "**Start Here" Link** on the Canvas home page to find details about the course and a canvas course navigation video that lays out the structure of the course on canvas.

Pre-Class: Will include assigned readings, videos to watch, self-study, and an on-line pre-class graded assignment. These required assignments will be posted on canvas on the pre-class page for each class, and will be available the Friday prior to class. Each pre-class online assignment is due by 8 am the day of the class.

In-Class: A class may begin with a discussion designed to address misconceptions revealed by the pre-class assignment and extend student learning by in depth discussion of key concepts. An audience response system, the Reef App, will be used to assess student learning. For select core or challenging concepts, a learning activity will be carried out to help improve student comprehension. Worksheets for in-class activities will be graded and need to be handed to the LAs and TAs. *Recording class sessions without instructor permission is prohibited. Those with permission should use the recordings for personal study only. Students should not post class recordings in any public forum or pass on recordings to another student.

Post-Class: Students are expected to read the book, review class-notes and reflect upon the in-class session. Students have to complete an online graded post-class assignment for each week's coursework. All post class online assignments are due Friday by 11:59 pm. For Monday classes the due date might be the same week. For all other classes the due date is Friday of the following week. Due dates are posted and appear on the Canvas TO DO list.

Assignments and Grading

Course grade will be determined from your percentage score out of **900** total points. Cumulative scores of 90%, 80%, 70% or 60% will guarantee grades of not less than A-, B-, C- and D respectively.
See Assignment and grading table below.

Assignment (Goal) *Information*	**Total Points** (calculation)	**Notes**
Pre-class (Students explore and engage) *Canvas pages include pre class work and Launchpad assignment*	**50** (From percentile score)	-Students have 3 attempts per assignment. -Canvas will automatically drop 3 lowest scores. -Students will use score drop for missed assignments.
In-class clickers (Assess learning and identify misconceptions) *Students will use the Reef app to participate in clicker activities. Subscription is included with textbook.*	**50** (From percentile score)	-Canvas will automatically drop 3 lowest scores. -Students will use score drop for missed assignments.
Post Class: Draw to learn *Directions and upload link is on canvas. Upload a picture of your drawing from your notebook.*	**100** (From percentile score)	-Canvas will automatically drop 3 lowest scores. -Students will use score drop for missed assignments.
Post-class: Assessments (Reinforcement, and practice) *Canvas pages include post class work: practice exams and/or Launchpad assignment.*	**100** (From percentile score)	-Students have 2 attempts per assignment. -Canvas will automatically drop 2 lowest scores. -Students will use score drop for missed assignments.
Worksheets (Reinforce core concepts, metacognition, practice) *Worksheets will be provided in class.*	**100** (From percentile score)	-Group work in class. Turn in to LAs or TAs. -Canvas will automatically drop 2 lowest scores or missed assignments.

Quizzes (Evaluate at regular intervals) *In class, on paper, see schedule for dates*	**100** (total score earned)	-Four 25-point quizzes -Practice exam-style questions -Will help students and instructors evaluate learning. -No drops
Mid Term exams (Summative assessment) *In class, on paper, see schedule for dates*	**250** (total score earned)	-Two 125-point exams -Practice exams will be provided. -No drops -Practice exams will be posted on Canvas
Final exam (Summative assessment) *In class, on paper, see schedule for dates, compulsory i.e. E for not taking*	**150** (total score earned)	-50% new material after second Mid term +50% comprehensive -No drops -Practice exams will be posted on Canvas
	900 Total Points	

Class Schedule

** Please note that we may modify the course schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas under announcements*

Class #	Date	Topic
		Module 1: Life and its Building Blocks
1	M, Jan 6	Introduction to the course
2	W, Jan 8	What is Life?
3	M, Jan 13	Fundamentals of life's chemistry
4	W, Jan 15	Water is essential for life: Why?
	M, Jan 20	**Martin Luther King Day**
5	W, Jan 22	**Quiz 1** + pH and building blocks of life
6	M, Jan 27	Nucleic Acids
7	W, Jan 29	Proteins
8	M, Feb 3	Enzymes and Energy
9	W, Feb 5	**Module 1: Capstone**
10	F, Feb 7	**Exam 1 (9:00-10:30 am OR 10-11:30 am)**
		Module 2: Information Flow
11	M, Feb 10	DNA Replication
12	W, Feb 12	Transcription
	M, Feb 17	**Presidents Day**
13	W, Feb 19	**Quiz 2** + Translation

14	M, Feb 24	Connect Concepts
		Module 3: Information Inheritance
15	W, Feb 26	Cell Cycle and Mitosis
16	M, Mar 2	Meiosis
17	W, Mar 4	Mendelian Genetics
	Mar 8-15	**Spring Break**
18	M, Mar 16	**Quiz 3** + Mendelian Genetics
19	W, Mar 18	**Modules 2 & 3: Capstone**
20	F, Mar 20	**Exam 2 (9:00-10:30 am OR 10-11:30 am)**
		Module 4: Energy Use and Conversion
21	M, Mar 23	Lipids and Membranes
22	W, Mar 25	Membrane Transport
23	M, Mar 30	Chemiosmosis
24	W, Apr 1	Powering Chemiosmosis
25	M, Apr 6	Carbohydrate Oxidation
26	W, Apr 8	Photosynthesis
27	M, Apr 13	Fundamentals of Energy Conversion and Energy Capstone
		Module 5: Multicellularity and Development
28	W, Apr 15	**Quiz 4** Cell-Cell Communication
29	M, Apr 20	Development of Multicellular Organisms
30	**T, Apr 28**	**Final Exam (3:30-5:30 pm) COMPREHENSIVE**

*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. Recording lectures without instructor permission is prohibited. Those with permission should use the recordings for personal study only. Students should not post lecture recordings in any public forum pass on recordings to another student.

Expected Learning Outcomes

After this course students should be able to…

- Recall and describe the four major classes of biomolecules and their relationships to cellular structures and functions.
- Explain the cellular and molecular basis of energy use and conversion.
- Apply the principles of genetics to explain how information is stored, transmitted and used.
- Provide examples of how multicellular organisms are complex cellular networks that integrate and respond to information.
- Read and interpret scientific literature, graphs and data.
- Communicate scientific concepts through individual and group activities.
- Evaluate interactions between biology and society.

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 sub cellular to behavioral 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 use quantitative reasoning.** Students will be able to use mathematical and computational methods and tools to describe living systems and be able to apply quantitative approaches, such as statistics, quantitative analysis of dynamic systems, or mathematical modeling.

• **Ability to participate in the interdisciplinary nature of science** through clear communication and collaboration with other disciplines. Students will be able to apply concepts and sub disciplinary knowledge from within and outside of biology in order to interpret biological phenomena, communicate with clear written and oral arguments, and work collaboratively to solve problems.

• **Ability to explain the relationship between science and society, and engage**. 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.

Course Policies

Missed assignments: Generously, three grade drops are provided for all assignments (except exams and quizzes) to accommodate low scores or assignments missed due to unexpected issues. There will be absolutely no make ups for any missed assignments.

Rescheduling exams: You can arrange to take make-up exams or quizzes **only** under **extenuating** circumstances, for example if you are extremely sick, injured or are under arrest. In all circumstances, makeup exams require official documentation, and instructor permission. IF you have an unplanned medical or legal emergency and are unable to make it to an exam, contact your instructor immediately (within 24 hours). Plan ahead so there is time to call a friend or take the bus if you have an unreliable car.

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 (a random subset of exams are always photocopied before being returned to students). If you believe the exam has an error, write a complete explanation, attach it to the exam, and return it to the instructor within 7 days of the exam being

returned. Be specific and use sound scientific reasoning to explain why your answer should have been awarded more points.

Attendance & Punctuality: The University and your instructors expect all students to attend all class meetings. Students are expected to acquaint themselves and satisfy the entire range of academic objectives and requirements as defined by this syllabus.

Electronic Devices in Class: Students are encouraged to bring their primary electronic devices (laptops/tablets) to access course content. Devices may only be used for course-related material during class, and the instructor holds the right to ask you to leave the classroom for such behavior.

Equipment Failure: It is your responsibility to maintain your electronic equipment for participation in the course assignments.

Computer and canvas literacy expectations: Students are expected to be computer and internet literate to take this course, including canvas navigation skills. 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 Launchpad assignments. Post your technical issues to the class discussion board and we will crowd source solutions as issues arise. For Canvas orientation, see https://utahtacc.zendesk.com/hc/en-us/articles/205654094.

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

1. Posting photos or comments off topic in a classroom are still off-topic in an online class forum.
2. Off color language and photos are **never** appropriate.
3. Using angry or abusive language is called flaming and is not acceptable and will be dealt with according to the student code.
4. 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?????
5. Course e-mails 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.

University of Utah Policies

Drop, Withdrawal or Incomplete: 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. We 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.

Academic misconduct: All suspected cases of academic misconduct including cheating, answering clicker questions for someone else, and plagiarizing will be dealt with according to rules in the Code of Student's Rights and Responsibility: http://regulations.utah.edu/academics/6-400.php 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. Please know that looking at someone else's exam is cheating and will be dealt with seriously as stated above. By accepting admission to the University you have agreed to abide by the University rules provided to you in the student handbook.

The Americans with Disabilities Act: 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. If you would like to request academic accommodations due to a disability, please Center for Disability Services. If you have a letter from CDS indicating you have a disability that requires academic accommodations, please present the letter to the instructor and discuss the accommodations.

University Safety Statement: The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

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 Student Wellness 426 SSB, 801-581-7776.

Inclusive Learning Policy: We are committed to making our classroom, canvas discussions and other interactions as inclusive as possible. Mutual respect, civility, and the ability to listen to others are crucial for making our time together productive and engaging. The diversity of backgrounds and perspectives that students bring to this class are viewed as a resource, strength and benefit. Your suggestions are encouraged and appreciated. Please let your instructor know ways to improve the effectiveness of the course for you personally or for other students or student groups.

Veterans Center: If you are a student veteran, the U of Utah has a Veterans Support Center located in Room 161 in the Olpin Union Building. Hours: M-F 8-5pm. Please visit their website for more information about what support they offer, a list of ongoing events and links to outside resources: http://veteranscenter.utah.edu/ Please also let me know if you need any additional support in this class for any reason.

English Language Learners: If you are an English language learner, please be aware of several resources on campus that will support you with your language and writing development. These resources include: the Writing Center (http://writingcenter.utah.edu/); the Writing Program http://writing-program.utah.edu/ the English Language Institute http://continue.utah.edu/eli/ Please let your instructor know if there is any additional support you would like to discuss for this class.

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.

Note: *This syllabus is meant to serve as an outline and guide for this course, and might be modified in response to the needs of the class. All changes will be announced in class and posted on Canvas under Announcements.*