THE UNIVERSITY OF UTAH

Fall Semester 2020 SYLLABUS for
Biology 1610-001 Fundamentals of Biology I
Monday and Wednesday 8:05 am to 9:25 am on Canvas Zoom (IVC)
The same syllabus will be used for Biology 1610-011 Fundamentals of Biology I
Monday and Wednesday 3:00 pm to 4:20 pm on Canvas Zoom (IVC)

For Fall 2020, all sections of Biology 1610 are being offered as Instructional Video Conferencing (IVC) classes. Class sessions will be held at the scheduled times via Zoom. Quizzes and exams will also be administered via canvas during class time. Participation in the course will depend on having access to a computer and a broadband internet connection, as well as being able to use Canvas, Zoom and other online resources effectively.

If you are a student enrolled for Fall in need of a laptop or other technology equipment, see Marriott Library student checkout equipment. If you are in need of off-campus internet access, many Xfinity and Xmission public wireless locations are free to access. Xfinity Internet Essentials is free for 2 months to qualified customers and $9.95 in subsequent months. Students enrolled for Fall can request a mobile hotspot from Marriott Library student checkout equipment. See https://union.utah.edu/resources-spaces/basic-needs-center/ for additional COVID-related links. Please contact the instructor as soon as possible if you have concerns about these requirements. Further details are provided in the sections below.

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 (worksheets and clicker questions) and outside the *"classroom"* is essential. Biol 1610 is a 4 credit course therefore lecture and discussion times are both required. This SF designation (Physical/Life Science exploration) course is intended for Biology majors and other pre-health science pathways. 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.

Instructor: Dr. Lucas Moyer-Horner
I am happy to meet with you on zoom right after class (just stay logged on) or by appointment.
Set up an appointment or ask quick questions by email. **Use this email Lucas.M.Horner@utah.edu**
Put Biol 1610 in the subject line so your email can be given preference. Allow 36 hours for a response. If I haven't answered in 36 hours feel free to resend your message. **Do not email through Canvas** since these get buried. Procedural (How do I upload to canvas) or content questions are better asked on the canvas discussion board so that other students benefit from your questions and our answers. These can be answered by peers, TAs, LAs or instructor. The instructional team will moderate all discussion board questions to insure accuracy

Lecture: We are designated as interactive video conferencing (IVC) for lecture and discussion. You sign into lecture using the zoom tab on our canvas page. Make sure to have your **microphone on mute** unless you are called on. These are real time* and interactive in order to be as close as possible to a real classroom experience while staying safe. Lectures will be at class time and you signed up for a discussion time that fit your schedule.

*Each lecture will be recorded and posted to Canvas after class. These recordings will help you review the material or can be watched if you miss a class but will not allow for participation points. Reef App points are gathered in real time since this is designated as IVC not an asynchronous video online class. We allow 3 missed classes before the participation points start affecting your grade. If you live in a time zone that makes lecture time an unreasonable please contact me for an alternative to Reef App points.

A class may begin with a discussion designed to review the previous class and assess student learning. In both lecture and discussion, you will use an audience response system, the Reef App (or zoom polling), to answer questions for participation points and to uncover misconceptions. For select core or challenging concepts, a worksheet activity will be carried out to help improve student comprehension. This worksheet will be posted on canvas, completed by each student working in their preassigned group during lecture, and uploaded to Canvas by midnight the day of class.

Discussions (required): You sign into discussion for your registered section, using the zoom tab on our canvas page. Make sure to have your **microphone on mute** unless you are called on. You can ask question using zoom chat or the raise hand function. This course offers Teaching Assistants (TAs) as well as Learning Assistants (LAs) for class help. 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, LAs and discussion times are listed on the Canvas Home page under the Instructional Team tab.

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 ebook subscription is included in your registration cost** unless you opted out using the opt out link on registration page. This $60 fee includes 2-years access to the E-book with Launchpad learning software and a 12-month subscription to the iClicker Reef App software. Please click on the START HERE link on our Biol 1610 canvas home page to access instructions for connecting to Launchpad, ebook and iClicker Reef. Help will also be provided on the first day of class.

Electronic Devices: Students will use their primary electronic device (laptop/tablet/smart phone) to access course content and to participate in course activities. Make sure you have a web camera for discussions, questions and proctoring. Clicker questions can be answered on your primary device or a secondary device (tablet/ smart phone) can be used. Do not use your electronic devices during class for non-course related activities.

Zoom Etiquette: When you join our live class on Zoom, please conduct yourself in the same manner as if we were in a classroom. Join the Zoom meeting 5 minutes early to make sure you can connect because class will start promptly on time. As you join, please make sure that you are muted the entire time unless you are asking a question. To ask a question during class, feel free to ask it over Zoom chat, which will be monitored by the TAs, or use the raise of hand function in Zoom and wait to speak until the instructor or a TA calls on you. In Zoom chat, please only post messages that are relevant to the class. The instructor has the right to ask you to leave the zoom classroom for inappropriate behavior.

During class, you will be placed in breakout rooms with around 4 other students for a discussion or to complete a learning activity. During group work, please participate in your group and have your video camera on unless you have connection issues. If you have any reason that you are unable to have your webcam on, please let the TA or LA know.

To join class, please go to our class on Canvas and click on the Zoom tab. There you will see all upcoming scheduled meetings, including the meeting to join our class (this link will be the same for all class days and your scheduled discussion, (unless an announcement is made on Canvas). *Do not join from calendar link or other ways, join with zoom tab on canvas.*

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.

Quizzes and Exams: Quizzes and exams will be administered during class time on the days indicated on schedule using the Quizzes tab on Canvas. Each quiz will be timed, 20-30 minutes, and will be on the material since the last quiz. The midterm exam will take the entire class time and the final is two hours. Even though these quizzes and exams are online, they are to be taken as if they were in a face-to-face classroom , meaning no cheating, no notes, books, friends, or use of the internet. These quizzes and exams are intended to motivate your studying and long term retention and to help you gauge how well you are understanding the materials for this course. Do not share any information about the quiz with other students or give any form of assistance. If we find evidence of cheating on a quiz, including working with another student or uploading questions to an online website, all students involved can be given a failing grade in the course.

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)	-Work in groups in zoom break out during lecture activity time, and after class on discussion board with peers, LAs/TAs. Upload link will be on canvas (like DTL) -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 exam (Summative assessment) *In class, on paper, see schedule for dates*	**250** (total score earned)	-TWO 125-point mid term exams. -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)	COMPREHENSIVE Final -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, Aug 24	Introduction to the course
2	W, Aug 26	What is Life?
3	M, Aug 31	Fundamentals of life's chemistry
4	W, Sep 2	Water is essential for life: Why?
	M, Sep 7	**Labor Day**
5	W, Sep 9	**Quiz 1** + pH and building blocks of life
6	M, Sep 14	Nucleic Acids
7	W, Sep 16	Proteins
8	M, Sep 21	Enzymes and Energy
9	W, Sep 23	**Module 1: Capstone**
10	M, Sep 28	**Exam 1**

		Module 2: Information Flow
11	W, Sep 30	DNA Replication
12	M, Oct 5	Transcription
13	W, Oct 7	**Quiz 2** + Translation
14	M, Oct 12	Connect Concepts: Central Dogma
		Module 3: Information Inheritance
15	W, Oct 14	Cell Cycle and Mitosis
16	M, Oct 19	Meiosis
17	W, Oct 21	Sources of Variation and Mendel
18	M, Oct 26	**Quiz 3** + Mendelian Genetics
19	W, Oct 28	Mendelian Genetics
20	M, Nov 2	Modules 2&3 Capstone: Mutation
21	W, Nov 4	**Midterm 2**
		Module 4: Energy Use and Conversion
22	M, Nov 9	Lipids and Membranes
23	W, Nov 11	Membrane Transport
24	M, Nov 16	Fundamentals of Energy Conversion and Chemiosmosis
25	W, Nov 18	Carbohydrate Oxidation
26	M, Nov 23	Electron Transport Chain and Chemiosmosis
27	W, Nov 25	Photosynthesis and Energy Capstone
		Module 5: Multicellularity
28	M, Nov 30	**Quiz 4** + Cell-Cell Communication
29	W, Dec 2	Development
30	**H, Dec 10**	**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 email the letter to me so we can discuss the accommodations you might need for class. Recording lectures without instructor permission is prohibited. I will post recordings of our zoom lectures on canvas which are for personal study only. Students should not post lecture recordings to the web or any other public forum or pass on recordings to another student as we have copyrighted images.

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, two or 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 quizzes and exams: If you believe that there has been a grading error, please check the information in your textbook or discussion first. Then explain why your answer should have been awarded more points using sound scientific reasoning. Please be specific and professional. Regrades requests are accepted within 7 days of the exam return.

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 use 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 zoom class room 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.*