

SYLLABUS for
Biology 1610 Fundamentals of Biology I Summer 2023
Lecture Sections 001 & 011
Section 001: M/W/F: 10:00-11:15am, ASB 220 (in person)
Section 011: M/W/F: - 11:30-12:45 ASB 210 (in person)
Discussion sections are required

Course Description

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 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 LF designated (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.

Course instructor:
Dr. Colby Tanner

Instructor Office hours and contact information:

- Dr. Tanner
 - Office hours: by appointment
 - Email: colby.tanner@utah.edu

- **Please Do NOT email me through Canvas. Email instructors directly at the email addresses listed above.** Please put Biol 1610 in the subject line so your email can be given preference. Please also give both instructors 24 working hours to respond to your email.

Lecture (required): This course will be held in person. Except in cases of ADA accommodations or quarantining due to COVID-19 exposure or infection, you will be expected to attend class in person and complete assignments and exams in person. Changes to this policy are up to the discretion of the instructor.

Discussions (required) and LA Office Hours (optional but recommended): You registered for a discussion section to fit your schedule. Weekly discussions are face to face on campus with rooms and times as shown on CIS schedule. This course offers Teaching Assistants (TAs) as well as Learning Assistants (LAs) that run discussions and Study Hall. TAs and LAs are undergraduate students who, through the guidance of weekly preparation sessions and an LA pedagogy course, facilitate discussions among groups of students that encourage active engagement, uncover misconceptions, and overcome content hurdles. They will not simply “give you the answer”. They will instead direct and empower you to figure out the answer on your own. One or two class worksheets are done each week in discussion. The aim is to struggle together on core concepts in order to improve student comprehension. TAs and LAs will also offer Study Halls times to help you with all course assignments and class concepts. Study Hall times are listed on the Canvas Home page under the Instructional Team tab.

Required Materials

Textbook: Biology, How Life Works, Fourth Edition, 2023. 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 the registration page. This \$56.647 fee includes access to the E-book with Achieve learning software and a subscription to the iClicker Cloud App software. Access your ebook and all Achieve study guides through “Macmillan Learning”, then “Achieve”.

Electronic Devices in Class: Students are encouraged to bring their primary electronic devices (laptops/tablets/smart phones) 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 homepage to find details about the course and to help you get started.

- **Pre-class:** Will include assigned readings, videos to watch, self-study, and an online pre-class assignment (optional) that is linked on Canvas. These 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 before class on the day of 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 iClicker Student App, will be used to assess student learning. Students must answer 75% of the questions each day (right or wrong) in order to gain participation points. Just joining for attendance and not participating does not count for points. 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 turned in before you leave class each day.** *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, homework, exams, or quizzes to another students.
- **Discussion:** For select core or challenging concepts, a learning activity will be carried out to help improve student comprehension. **These discussion sections are REQUIRED.** Attendance will be taken during discussions by answering iClicker questions throughout the discussion and will count towards your final grade in this class.
- **Post-class:** Students are expected to read the book, review class-notes and reflect upon the in-class session. Students complete two types of post class homework: a Draw to Learn (DTL) for each lecture and post-class Practice Quiz questions on the lectures each week. **These activities will be graded and need to be submitted on Canvas by midnight (11:59pm, Mountain Time) Sunday.** Due dates are posted and appear on the Canvas TO DO list.
- **Quizzes:** Four quizzes will be administered online on Fridays throughout the semester (see schedule below for dates) through the Quizzes tab on Canvas. These quizzes can be taken at any time on Friday but will close at 11:59pm. Each quiz will be timed, 20-30 minutes, and will be on the material since the last quiz. Even though these quizzes are online, these quizzes are to be taken as if they were in class, meaning, no notes, book, friends, or the internet. To help ensure that students are compliant with the expectations above, once a student has begun a quiz, they may not click off the Canvas quiz tab. Failure to comply with this expectation will result in a decrease in a student’s score. These quizzes are to help you test yourself and 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 will be given a zero for that quiz and up to a failing grade in the course, and your cheating will be reported to the School of Biological Sciences and the university.

- **Exams:** Exams will be administered in person during class time on the days indicated on the schedule. These exams are intended to motivate your studying, improve long-term retention, and to help you gauge how well you are understanding the materials for this course.

Additional Resources for Learning

The Learning Center

The Learning Center offers free academic support to currently-enrolled University of Utah students. Learning Center services are intended to help students gain a deeper understanding of course content and develop transferable skills to become more successful students and lifelong learners. Learning Center services include:

- Individual tutoring: 30-minute or 60-minute appointments held in person or virtually
- Supplemental Instruction (SI): Facilitated, organized study sessions
- Learning Consultations: Individual meetings to discuss developing academic success skills such as time management, study strategies, critical thinking, etc.

To view our services and schedule an appointment, visit <http://learningcenter.utah.edu> .

Student Success Coaching

Student Success Coaches meet individually with students in-person, on Zoom or over the phone in 30-45 minute coaching sessions to provide support, resources and motivation in pursuing your goals and making the most of your college experience. You can work with your coach on goal-setting, time management, finding community, staying healthy and well, discovering new resources and opportunities on campus that can enhance your education...or all of the above!

While you can work with any of the coaches found at <http://ssc.utah.edu> , members of the student success coaching team will be visiting this class and reaching out to you via email to invite you to schedule an appointment. Here's their contact information if you'd like to reach them even before they reach out to you:

- *April Ollivier, Student Success Coach/ april.ollivier@utah.edu /801-946-6847 (call or text)*
- *Eric Scheidt, Student Success Coach/ eric.scheidt@utah.edu /385-867-0092 (call or text)*
- *Loretta Rowley, Student Success Coach/ loretta.rowley@utah.edu /385-867-0086 (call or text)*

Assignments and Grading

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	Final Grade Weight	Notes
Pre-class (Students explore and engage) <i>Canvas pages include pre class work and Launchpad assignment</i>	5%	<ul style="list-style-type: none"> Students have 3 attempts per assignment. Canvas will automatically <u>drop 4 lowest</u> scores. Students will use score drop for missed or late assignments.**
In-class clickers* (Assess learning and identify misconceptions) <i>Students will use the iClicker Student app to participate in clicker activities. Subscription is included with textbook.</i>	10%	<ul style="list-style-type: none"> We will <u>drop 4 lowest</u> class clicker scores Students must answer 75% of questions each day to earn participation points. Check your scores in the Participation column on iClicker app NOT the attendance column. Students will use score drops for missed days or low participation scores.
Post Class: Draw to learn <i>Draw to Learn assignment on canvas. Upload a picture of your drawing from your notebook.</i>	10%	<ul style="list-style-type: none"> Canvas will automatically <u>drop 4 lowest</u> scores. Students will use score drop for missed assignments.
Post-class: Practice Quizzes (Reinforcement, and practice) <i>Canvas pages will have a link to post class questions.</i>	5%	<ul style="list-style-type: none"> Students have 3 attempts per assignment. Canvas will automatically <u>drop 2 lowest</u> scores. Students will use score drop for missed assignments.
Worksheets (Reinforce core concepts, metacognition, practice) <i>Worksheets will be provided in class or on canvas.</i>	10%	<ul style="list-style-type: none"> Canvas will automatically <u>drop 2 lowest</u> scores. Students will use score drop for missed assignments.
Discussions* <i>We use the same iClicker Student app in lecture but students must also join their discussion section in iClicker.</i>	10%	<ul style="list-style-type: none"> Will <u>drop the 2 lowest</u> discussion scores or missed discussions
Quizzes (Evaluate at regular intervals) <i>On Canvas, see schedule for dates</i>	10%	<ul style="list-style-type: none"> Five 20-point quizzes Practice exam-style questions Will help students and instructors evaluate learning. <u>Missed quizzes cannot be made up.</u> Canvas will automatically <u>drop your (1) lowest quiz score.</u> No group work, not open book.
Mid Term exams (Summative assessment) <i>In class, on paper, see schedule for dates</i>	25%	<ul style="list-style-type: none"> Two 100-point midterm exams <u>NO drops</u>, no group work, not open book
Final exam (Summative assessment) <i>In class, on paper, see schedule for dates, compulsory i.e. E in the course for not taking</i>	15%	<ul style="list-style-type: none"> 150-point COMPREHENSIVE Final <u>NO drops</u>, no group work, not open book.
	100%	

*Attending lecture and discussions in person is required and points are assigned for class and discussion participation with clickers.

**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.

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	Instructor
		Module 1: Life and its Building Blocks	
1	M, May 13	Introduction to the course	Tanner
2	W, May 15	What is Life?	Tanner
3	T, May 17	Fundamentals of life's chemistry	Tanner
4	M, May 20	Water is essential for life	Tanner
5	W, May 22	pH and building blocks of life	Tanner
6	F, May 24	Nucleic Acids	Tanner
	F, May 24	QUIZ 1 must be taken on Friday, May 24	
	M, May 27	NO CLASS – Memorial Day	
7	W, May 29	Proteins	Tanner
8	F, May 31	Enzymes and Energy	Tanner
9	M, June 3	Module 1: Capstone	Tanner
10	W, June 5	Review and Catchup	Tanner
11	F, June 7	Exam 1	
		Module 2: Information Flow	
12	M, June 10	DNA Replication	Tanner
13	W, June 12	Transcription	Tanner
14	F, June 14	Translation	Tanner
15	M, June 17	NO CLASS – Juneteenth Day	
16	W, June 19	Review and Catchup	Tanner
17	F, June 21	Module 2 Capstone: Central Dogma	Tanner
	F, June 21	QUIZ 2 must be taken on Friday, June 21	
		Module 3: Information Inheritance	
18	M, June 24	Connect Concepts: Central Dogma	Tanner
19	W, June 26	Cell cycle and Mitosis	Tanner
20	F, June 28	Meiosis	Tanner
	F, June 28	QUIZ 3 must be taken on Friday, June 28	
21	M, July 1	Sources of Variation and Mendel	Tanner

22	W July 3	Mendelian Genetics	Tanner
23	F, July 5	Module 3 Capstone: Mutation	Tanner
	F, July 5	QUIZ 4 must be taken on Friday, July 5	
24	M, July 8	Review and Catch Up	Tanner
25	W, July 10	Exam 2	
		Module 4: Energy use and conversion	
26	F, July 12	Lipids and Membrane	Tanner
27	M, July 15	Membrane Transport & Diffusion/Osmosis	Tanner
28	W, July 17	Fundamentals of Energy Conversion	Tanner
29	F, July 19	Carbohydrate Oxidation	Tanner
30	M, July 22	Electron Transport Chain & Chemiosmosis	Tanner
	W, July 24	No Class: Pioneer Day	
31	F, July 26	Photosynthesis	Tanner
	F, July 26	QUIZ 5 must be taken on Friday, July 26	
32	M, July 29	Module 4 Capstone: Energy	Tanner
33	W, July 31	Review and Catch Up	Tanner
34	Th, Aug 1	Final Exam COMPREHENSIVE (section 011) 10:00-12:00	
34	F, Aug 2	Final Exam COMPREHENSIVE (section 001) 10:00-12:00	

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, one, two, or four grade drops are provided for all assignments (except exams) to accommodate low scores or assignments late or 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: If you believe that there has been a grading error, please check the information in your textbook or discussion first. Then explain, in writing, why your answer should have been awarded more points using sound scientific reasoning. Please be specific and professional. Regrades requests are only 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 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/enus/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

9 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. If you need help, reach out for campus mental health resources, including counseling, trainings and other support.

Financial Wellness Center: FWC provides competent and confidential financial counseling services for students. Their goal is to help students establish healthy financial habits and knowledge that can prepare you for life long financial success. Some of the topics we cover are: budgeting, student loans, credit cards, scholarships, paying for school. Email: financialwellness@sa.utah.edu Phone: 801-585-7379 Please see the FWC website for events schedule and more info: Financialwellness.utah.edu

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.*