



**Fall Semester 2023 SYLLABUS for
Biology 1610-021 Fundamentals of Biology I
uTh / 10:45am-12:05pm HEB2008**

Course Description

This 4-credit course introduces the workings of life from the molecular to the multi-cellular level. This course is intended for Biology majors and other pre-health science pathways. Topics covered in the course include molecular and cellular biology, genetics, information flow, energy metabolism, and cell signaling. The course includes a 3-credit lecture and a 1-credit discussion and BOTH lecture and discussion are required. This course is part of a four-course sequence required for biology majors, which includes 1620 (focusing on evolution, physiology, and ecological interrelationships), and two labs, 1615 and 1625.

Class Modality: Both lecture and discussions are **in-person** on campus and participation points are collected with iClicker. Lecture and discussion times and rooms are shown on the schedule. Quizzes and exams will also be administered in-person via Canvas and during class time. Participation in the course will depend on having access to a laptop, tablet or smartphone and a broadband internet connection, as well as being able to use Canvas and other online resources effectively. Lecture and discussions will use active learning - a form of evidence-based teaching that directly involves the students in the learning process. Student participation both inside and outside the “classroom” is essential.

Prerequisite Knowledge: This is a rigorous and demanding “*foundations in biology for majors*” class. Students are expected to have a high school-level knowledge of chemistry and biology. If you have not taken chemistry and biology in high school, then General Chemistry-I and/or Biol 1010 are recommended courses to take before taking this class.

Instructional Team: Your lead instructor for this section of the course is **Dr. Colby Tanner**. Dr. Tanner will lead all lectures and manage all your course requirements. Biol 1610 is a multi-section course that is coordinated across sections by Dr. Renee Dawson, who may occasionally send you announcements/emails regarding the course. This course also offers Teaching Assistants (TAs) as well as Learning Assistants (LAs) that run discussions (and assist with activities and questions during lectures). TAs and LAs are undergraduate students who, through the guidance of weekly preparation sessions, TA training 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. TAs and LAs will also offer in-person and Zoom study halls times to help you with all course assignments and class concepts. Study hall times will be listed on the Canvas Home page under the Instructional Team tab.

Lecture and Discussions: **Biol 1610-21** is the lecture section for this class. Sections **022-026** are discussion sections that belong to this lecture. Students will be automatically registered for the lecture section when registering for the discussion section. Students are expected to attend both the lecture and the discussion they registered for.

Each student is expected and only allowed to attend the discussion they are registered for.

All lectures will be instructor lead with the help of circulating TAs and LAs and will involve direct instruction and active-learning exercises. A class may begin with a discussion designed to review the previous class and assess student learning. Weekly discussions are also face to face on campus with rooms and times as shown on the CIS schedule. In both lecture and discussion, you will use an audience response system, the iClicker Student app, to answer questions for participation points and to uncover misconceptions. Clicker points are gathered in real-time, and you **must be in the classroom for the clicker to work**. 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 groups during discussion or during lecture, and uploaded to Canvas by midnight (Mountain Time) the following Sunday. We allow **four** missed lectures and **two** missed discussions before the participation points start affecting your grade.

Help with Coursework: TAs and LAs will conduct weekly **Study Halls** in person and on zoom. These study halls are optional small group (usually), informal, drop in, meetings to give you an opportunity to work with your peers on homework assignments (worksheets, DTL, Pre and Post class questions, your old exams/quizzes). You can ask the Study Hall leader (TA or LA) content questions or for advice on study techniques. The study hall schedule with Zoom links will be posted on Canvas within the first two weeks of class. Before each quiz and exam, **review sessions** will also be held. Times and locations will be announced on Canvas. Procedural (How do I upload to Canvas) or content questions are best 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 ensure accuracy

Contacting the Instructor: Dr. Colby Tanner is happy to meet with you right after class or by appointment scheduled via email. To set up an appointment or ask quick questions by email, please use this address: amanda.hoepfner@utah.edu Put Biol 1610 in the subject line so your email can be given preference. Allow 36 hours for a response. If your email hasn't been answered in 36 hours feel free to resend your message. **Do not email through Canvas** since these messages get buried.

Required Materials

Textbook: Biology, How Life Works, **Fourth Edition**, 2023. Authors: Morris J, et. al. Publisher: Macmillan Education. **The ebook subscription is included as a course fee with your class tuition cost** unless you opted out using the link on the course registration page. This course fee includes access to the E-book and a 12-month subscription to the iClicker Student App. Please click on the START HERE link on our Biol 1610 Canvas home page to access instructions for connecting to ebook and iClicker. Help will 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. 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.**

If you are a student enrolled for Fall semester and 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.

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.

1. **Pre-Class:** Will include assigned readings, videos to watch, self-study, and an online pre-class graded assignment that is linked on Canvas. 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. For each assignment, you will have two attempts to answer all of the questions correctly. Each pre-class online assignment is due by class time.
2. **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 submitted on Canvas by midnight (Mountain Time) the following Sunday. *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 other students.**

3. **Discussion:** For select concepts, a learning activity will be carried out during discussion to help improve student comprehension. Worksheets for discussion activities will be graded and need to be submitted on Canvas by midnight (Mountain Time) the Sunday after discussion.
4. **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 for each week (two lectures). These activities will be graded and need to be submitted on Canvas by midnight (Mountain Time) Sunday. Due dates are posted and appear on the Canvas TO DO list.

Assignments and Grading

Weekly Assignments: For each week of class students are required to complete the following assignments:

- 2 pre-class Canvas quizzes, one before each lecture
- Participate in iClicker sessions during lecture and discussion to earn participation points
- 1-2 worksheets in class and/or discussion and upload to canvas weekly.
- 2 Draw-to-learn assignments, one for each class
- 1 post-class practice quiz each week.

Note: Classwork and homework assignment make-ups are not allowed. For sickness or unexpected absences multiple grade drops are allocated for each assignment set. See table below for number of drops. Please plan on using your drops for incomplete assignments.

Quizzes and Exams: Quizzes and exams will be administered using the Canvas quiz feature during class time on the days indicated on the schedule. Each quiz will be timed, 20-30 minutes, and will be on the material since the last quiz. The midterm exams 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, improve 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.

Grading: See Assignment and grading table below. Course grade will be determined from your percentage score out of **800** total points. Here is the breakdown of grade cut offs and where the individual precise grades land in this class: **A=93%; A- =90 %; B+=87%; B=83%; B- =80%; C+=77%; C=73 %; C- =70 %; D+=67%; D=63%; D- =60%; E= < 60%.**

Assignment (Goal) Information	Approx*** Points	Notes
Pre-class (Students explore and engage material before lecture) <i>Canvas pages include pre-class work and Canvas pre-class assignment</i>	36 pts (2 pts each)	-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 in real time) <i>Students will use the iClicker Student app to participate in clicker activities. Subscription is included with textbook.</i>	80 pts (~4 pts each participation point)	-We will <u>drop 4 lowest</u> class clicker scores - Students must answer 75% of questions each day to get 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	90 pts (5 pts each)	-Canvas will automatically <u>drop 4 lowest</u> scores. -Students will use score drop for missed or late assignments.

<i>Directions and upload link is on canvas. Upload a picture of your drawing from your notebook.</i>		
Post-class: Practice Quizzes (Reinforcement, and practice) Canvas pages will have a link to post class quizzes.	55 pts (5 pts each)	-Students have 3 attempts per assignment. -Canvas will automatically <u>drop 2 lowest</u> scores. -Students will use score drop for missed or late assignments.
DISCUSSION Clickers <i>We also use the iClicker Student app in discussions, which students will need to join (each discussion will have a unique session that is different than the lecture session).</i>	50 pts (~5 pts each)	-We will <u>drop the 2 lowest</u> discussion clicker scores. (Two missed week allowed)
Worksheets (Reinforce core concepts, metacognition, practice) <i>Worksheets will be on Discussion or In-class Canvas pages. There is usually one worksheet in discussion and one in class each week.</i>	64 pts (4 pts each)	-Work in groups with peers, LAs/TAs. Upload link will be on Canvas (like DTL) -Canvas will automatically <u>drop 4 lowest</u> scores or missed or late assignments.
Quizzes (Evaluate at regular intervals) <i>In class, on Canvas, see schedule for dates</i>	50 pts (25 pts each)	-Three 25-point quizzes, drop lowest. No makeups. -Practice exam-style questions. -Will help students and instructors evaluate learning. -One drop, no group work, not open book.
Mid Term exams (Summative assessment) <i>In class, on Canvas, see schedule for dates</i>	200 pts (100 pts each)	-TWO 100-point midterm exams. -NO drops, no group work, not open book. -Practice exams will be posted on Canvas.
Final exam (Summative assessment) <i>In class, on Canvas, see schedule for dates, compulsory i.e. E for not taking</i>	150 pts	-COMPREHENSIVE Final -NO drops, no group work, not open book. -Practice exam will be posted on Canvas
	375 pts homework +400 pts Q&E	= approximate** 775 Total pts homework (48%)

*Yes, attending lecture and discussion in-person is required and points are assigned for class participation with clickers. Recording lectures without instructor permission is prohibited. Students should not post lecture recordings/notes/or questions to the web or any other public forum or pass on any of these to another student as we have copyrighted images.

**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.

***Approximate total point means that your instructors may skip an assignment and decrease the total points available in the class but the number of drops and point values of the assignments and tests will not change.

NOTE: We do not negotiate grades or extra credit assignments separately for individual students. Grading rules apply equally to all students of all sections of this multi-section 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
		Module 1: Life and its Building Blocks
1	T, Aug 22	Introduction to the course
2	H, Aug 24	What is Life?
3	T, Aug 29	Fundamentals of life's chemistry
4	H, Aug 31	Water is essential for life: Why? <i>(Sep 1 last day to drop)</i>
	T, Sep 5	No Lecture (other sections had Labor Day off on 9-5)
5	H, Sep 7	pH and building blocks of life
6	T, Sep 12	Quiz 1 + Nucleic Acids
7	H, Sep 14	Proteins
8	T, Sep 19	Enzymes and Energy
9	H, Sep 21	Module 1: Catchup and Capstone
10	T, Sep 26	Exam 1
		Module 2: Information Flow
11	H, Sep 28	DNA Replication
12	T, Oct 3	Transcription
13	H, Oct 5	Translation
	Oct 8-15	Fall Break
14	T, Oct 17	Connect Concepts: Central Dogma
		Module 3: Information Inheritance
15	H, Oct 19	Cell Cycle and Mitosis <i>(Oct 20 last day to W)</i>
16	T, Oct 24	Meiosis
17	H, Oct 26	Meiosis and Sources of Variation
18	T, Oct 31	Mendelian Genetics + Quiz 2
19	H, Nov 2	Mendelian Genetics
20	T, Nov 7	Modules 2&3 Capstone: Mutation
21	H, Nov 9	Exam 2
		Module 4: Energy Use and Conversion
22	T, Nov 14	Lipids and Membranes
23	H, Nov 16	Membrane Transport
24	T, Nov 21	Fundamentals of Energy Conversion
	H, Nov 23	Thanksgiving Break
25	T, Nov 28	Carbohydrate Oxidation
26	H, Nov 30	Electron Transport Chain and Chemiosmosis
27	T, Dec 5	Photosynthesis + Quiz 3
28	H, Dec 7	Module 4 Capstone: Connecting Cellular Respiration and Photosynthesis
	T, Dec 12	Final Exam (3:30-5:30 pm) COMPREHENSIVE

Course Policies

Missed assignments: Generously, two weeks worth of drops are provided for all homework and iClicker assignments to accommodate low scores or assignments late or missed due to unexpected issues. There will be absolutely no make ups for any missed assignments. There is one drop for the 25 point in-class quizzes (no makeups), no drops for exams.

Rescheduling exams: You can arrange to take a make-up exam **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, in writing, 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 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 board, emails, GroupMe or Discord chats are all considered equivalent to classrooms, and student behavior within those environments shall conform to the student code. Specifically:

1. Posting photos or comments that are not related to course topics or personal is not appropriate.
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.

COVID-19 Fall 2023 Statement

- General COVID-19 information and guidelines: <https://coronavirus.utah.edu/>
- Self reporting forms: In order to help monitor the spread of COVID-19 and respond appropriately, the university requires that all students, faculty and staff complete a reporting form if they have been exposed to, are being tested for or have been diagnosed with COVID-19: [Self-reporting Form](#)
- Exposure guidelines: If you have been exposed to COVID-19, you should read and follow the guidelines posted at: [University COVID exposure guidelines](#)

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.

Other 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. 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.*