



**SYLLABUS for
Biology 1620 Fundamentals of Biology II, Section 001**

Fall Semester 2023

MoWe 8:05-9:25am, JTB 310 (in person)

Course Description

This course introduces students to the immensity of biological diversity and the timeline of the origin and evolution of life on Earth, focusing especially on natural selection, the construction and interpretation of phylogenies, physiology, and ecological relationships. We will use *active learning* - a form of evidence-based teaching strategy that directly involves the students in the learning process. Studies have shown 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 1610 (focusing on molecular and cellular biology), and two labs, 1615 and 1625. 4 credits.

Instructors: Please do NOT email instructors through Canvas, email instructors directly through the email addresses listed below. Put Biol 1620 in the subject line so your email can be given preference. Please give the instructor 24 working hours to respond. Please click on the About Course link on the Canvas home page to learn more about your instructors.

Dr. Jim Ehleringer

Email: jim.ehleringer@utah.edu

Office hours: available for questions immediately after each lecture and office hours by appointment, please email to set up a Zoom meeting
(he/him/his)

Dr. Amanda Hoepfner

Email: amanda.hoepfner@utah.edu

Office hours: Wed. 12:30-1:30pm, Bldg 44 Rm 221, also available for questions immediately after each class and by appointment scheduled via email
(she/her/hers)

*For any questions regarding Achieve, iClicker, or grading, please email Dr. Hoepfner

Required Materials

Textbook: *Biology: How Life Works, Fourth 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.* The book subscription includes access to the E-book with *Achieve* learning software and a subscription to iClicker student software. Instructions on how to connect to *Achieve* and iClicker can be found on the Canvas home page. Please click on the *Start Here* Link to access these instructions. Help will also be provided on the first day of class.

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 each class in person and complete assignments and exams in person (exceptions require proper documentation and

reasonable notice before class or assignments are missed). Changes to this policy are up to the discretion of the instructors.

According to the CDC, wearing a mask remains an effective means of preventing infection for both unvaccinated and vaccinated people. Regardless of what someone chooses (mask or no mask), the university seeks to foster a sense of community and asks everyone on campus to be respectful of individual decisions on mask wearing.

The class will not be live-streamed or recorded.

Class help

Discussions (required): Discussions are in person. *Learning Assistants* (LAs) and *Teaching Assistants* (TAs) will hold multiple discussion sections each week. In the discussions, the LAs/TAs will guide you in reviewing quizzes, exams, practice problems, discussion, and active learning activities to help you apply the concepts we are learning in class for a better understanding of the material. These discussion sections are REQUIRED and you must attend the discussion that you are registered for. Attendance will be taken during discussions and will count towards your final grade, please see the assignments and grading section for more details.

Study Hall (optional): This course offers undergraduate *Learning Assistants* (LAs) who, through the guidance of weekly preparation sessions, facilitate discussions among groups of students that encourage active engagement, uncover misconceptions, and overcome content hurdles. The LAs for our class hold Study Hall hours (which may be held in person or over Zoom), which is one-on-one tutoring that you are free to drop in on and get extra help. LAs can help you with all course assignments and class concepts. LAs will not simply “give you the answer”. They will instead direct and empower you to figure out the answer on your own. LAs are available at designated times in the Study Hall (which will be determined the first week of class). Students struggling with a concept can also submit their question or comment to the Canvas discussion board.

Course Structure

This course guides student learning through three integrated components for each class session:

- Pre-class
- In-class
- Post-class work.

Pre-class: Will include assigned readings, videos to watch, self-study, and other resources through *Achieve* (the online platform for the book). The materials listed on the pre-class page on Canvas are required before each class and help you prepare for class. The pre-class material will be posted on Canvas on the pre-class page for each class and will be available one week prior to class meeting.

In-class: The in-class session is live and in person. A class may begin with a discussion designed to address misconceptions revealed by the pre-class reading 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. For select core or challenging concepts, a learning activity may be carried out to help improve student comprehension. **These learning activities will typically be accompanied by a worksheet given out during class that must be turned in before you leave class.**

Post-class: Students are expected to read the book, review class notes, and reflect upon the in-class session. A draw to learn or post-class assignment will be assigned at the end of each class (available on Canvas), which will be **due by the beginning of the following week (each Monday by midnight, 11:59pm)**. In addition, optional reading and viewing materials are provided to supplement the required materials for that topic. These materials are not required, but are likely to help you to better understand key concepts and to explore topics that are of interest to you.

Expected Learning Outcomes

By the end of this course, students should be able to:

- Describe fundamental events in the origins and evolution of life on Earth, including all major branches in the Tree of Life, and evaluate phylogenetic trees.
- Describe key evolutionary innovations: multicellularity, sex, and the evolutionary relationship between form and function.
- Explain major ecological cycles and services, including carbon (photosynthesis, respiration) and nutrient (nitrogen fixation, decomposition) cycles.
- Explain factors associated with mass extinction events through time, including the current Anthropocene Extinction.
- Read and interpret scientific literature, graphs, and data.
- Communicate scientific literature 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 used 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 sub-cellular functions to behavioral and ecological functions 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 scales ranging from the subcellular to organismal, and community scales. Students will also be able to explain 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 will 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.

Assignments and Grading

Assignment (Goal) Information	Final Grade Weight	Notes
In-Class Clicker Questions (Assess learning and identify misconceptions) <i>Students will use the iClicker Student app to participate in clicker activities. Subscription is included with textbook.</i>	13%	<ul style="list-style-type: none"> • <u>4 lowest scores or missed classes will be dropped.</u> • Missed clicker questions or sessions cannot be made up, and students will use score drop for missed assignments.
In-Class Activities (Reinforce core concepts with group interactions) <i>Students will hand in worksheets or write answers on paper.</i>	8%	<ul style="list-style-type: none"> • Canvas will automatically <u>drop 4 lowest scores.</u> • Missed activities cannot be made up, and students will use score drop for missed activities.
Post-class (Connect and cement concepts) <i>Post-class quiz or Draw to Learn assignment on Canvas or Achieve. Upload a picture of your drawing from your notebook.</i>	13%	<ul style="list-style-type: none"> • Canvas will automatically <u>drop 4 lowest scores.</u> • Missed post-class assignments cannot be made up, and students will use score drop for missed assignments.
Discussions (Practice applying concepts from class) <i>Weekly discussions must be attended to work in groups practice and reinforce core concepts</i>	13%	<ul style="list-style-type: none"> • Canvas will automatically <u>drop 2 lowest scores.</u> • Missed discussions cannot be made up, and students will use score drop for missed discussions.
Quizzes (Practice testing at regular intervals) <i>Online through Canvas quiz tab, taken at any time on Friday, see schedule for dates</i>	13%	<ul style="list-style-type: none"> • Six 20-point quizzes. • Canvas will automatically <u>drop your lowest quiz score.</u> • Missed quizzes cannot be made up.
Exams	25%	<ul style="list-style-type: none"> • Two 100-point exams. • <u>No drops.</u>

(Evaluate at regular intervals) <i>Taken in person on paper during class time, see schedule for dates</i>		<ul style="list-style-type: none"> Missed exams cannot be made up.
Comprehensive Exam (Summative assessment) <i>Taken in person on paper, see schedule for dates, compulsory</i>	15%	<ul style="list-style-type: none"> Comprehensive exam (200 points) that will cover material from the entire class. <u>No drops.</u>
	100%	

The scale for final, cumulative letter grades in this course is:

A	93 - 100%	B-	80 - 82.99%	D+	67 - 69.99%
A-	90 - 92.99%	C+	77 - 79.99%	D	63 - 66.99%
B+	87 - 89.99%	C	73 - 76.99%	D-	60 - 62.99%
B	83 - 86.99%	C-	70 - 72.99%	E	< 60%

Course Policies

Rescheduling Assignments, Quizzes, and Exams: The lowest grades for all assignments and in-class clicker questions are dropped to accommodate low scores and unexpected absences. Therefore, **rescheduling assignments is not allowed**. Rescheduling of quizzes and exams is allowed only under extreme extenuating circumstances, such as serious illness or injury. Written documentation, such as a doctor's note, is required in each case and the instructors must be notified asap. Rescheduled quizzes and exams are also allowed for school-sponsored activities if a letter from the faculty mentor is provided and the instructor is notified about it one week before the missed quiz or exam.

How will quizzes be administered? Quizzes will be administered online about every other Friday (see schedule below) through the Quizzes tab on Canvas. These bi-weekly 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 your cheating will be reported to the School of Biological Sciences and the university.

How will exams be administered? Exams will be given over the course of the semester. Each exam will be on material covered since the previous exam (except the comprehensive final). Exams will be administered in class during class time on paper. Exams are closed book meaning no notes, internet or a friend. If we find evidence of cheating on an exam, all students involved will be given a zero for that exam and your cheating will be reported to the School of Biological Sciences and the university.

Regrading Quizzes & Exams: Students may request the reconsideration of a grade on a quiz or exam within one week of the day that the quiz or exam was returned. The re-grade will only be considered if accompanied by a written description of the perceived error in grading and why the answer provided by the student is appropriate. If you submit a regrade request, the entire quiz or exam may be

regraded, which could result in the score increasing *or decreasing* as a result. Re-grade requests are only to be used if there is a genuine mistake made on your exam. Requests are not to be used if you disagree with the point allocation for a question, want to receive a higher grade on the exam, or if you do not understand why you did not receive full credit for a question. Points are received from demonstrating mastery of the material. If you did not receive full credit for a question, it is up to the student to discover what concept they omitted or stated incorrectly *before* they submit a re-grade request. For help, please visit your LAs and TAs during their discussions or Study Hall, ask the instructors after class, or set up an appointment with the instructors. The instructional team is here to help you understand the material and wants you to succeed! Please email your re-grade requests to the instructor of that section. Detail and organization in the request is critical. **Re-grade requests will not be considered after the one-week policy.**

Clickers/participation: An audience response system, the iClicker Student App, will be used to assess student learning during class. During class, questions will be posed throughout the lecture. Clickers (the iClicker Student app) allow you to respond to those questions. This polling is a form of active learning that allows you to practice applying the information you are learning in class. Polling via clickers also allows the instructors to assess how well the overall class is comprehending the material. If you answer 75% of the questions during each class period, you will receive full credit for participation that day (points are awarded based on participation, not accuracy). This allows you to receive credit even if you miss a question due to a slow internet connection or joining a few minutes late. It is your responsibility to ensure that you can respond to the clicker questions, **for help troubleshooting a problem, please see the resources listed under the FAQ page in Canvas.** Clicker points for the class are based on the participation score in iClicker, NOT attendance.

All work submitted must be your own: We encourage you to work in groups to complete your assignments. Discussing the concepts covered in class helps you learn. However, all work submitted must be your own. It is important to practice synthesizing the information by putting it into your own words or drawing the information yourself. Exceptions to this are the quizzes and exams. Quizzes and exams must be completed by yourself and no additional resources are allowed. If you submit identical assignments to another student in class, you will receive a zero on that work and your cheating will be reported to the School of Biological Sciences and the university.

Attendance & Punctuality: The University and your instructors expect all students to attend all class meetings. Students are expected to acquaint themselves with and satisfy the entire range of academic objectives and requirements as described in this syllabus. Given the nature of this course, regular attendance is required and adjustments cannot be granted to allow non-attendance. However, if you need to seek an ADA accommodation to request an exception to this attendance policy due to a disability, please contact the Center for Disability and Access (CDA). CDA will work with us to determine what, if any, ADA accommodations are reasonable and appropriate.

Equipment Failure: It is your responsibility to maintain your electronic equipment, including iClickers, for participation in the course assignments. Equipment failures will not be an acceptable excuse for late or absent assignment. If you experience any equipment problem or have internet connectivity issues that cause you to miss a class or an assignment, one of your drops will be used for the missed class or assignment.

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

Online Classroom Equivalency: Discussion threads, emails 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 also off-topic in an online forum and are prohibited.
2. Off-color language and photos are never appropriate and are prohibited.
3. Using angry or abusive language 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.

****See class schedule on next page****

Course 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.

Week	Date	Topic	Quiz Dates	Instructor
1	Aug 21	Course Introduction		Hoepfner
	Aug 23	Introduction to Evolution		Hoepfner
2	Aug 28	Evolution by Natural Selection		Hoepfner
	Aug 30	Evolutionary Processes		Hoepfner
3	Sept 4	NO CLASS – Labor Day		
	Sept 6	Evolution catch-up day	Quiz 1 – Fri, Sept 8	Hoepfner
4	Sept 11	Sexual Reproduction		Hoepfner
	Sept 13	Species and Speciation		Hoepfner
5	Sept 18	Phylogenetic Trees		Hoepfner
	Sept 20	Origin of Life	Quiz 2 – Fri, Sept 22	Ehleringer
6	Sept 25	Bacteria and Archaea Diversity		Ehleringer
	Sept 27	The Evolution of Photosynthesis		Ehleringer
7	Oct 2	Origin of Eukaryotes		Ehleringer
	Oct 4	EXAM 1		
8	Oct 9	NO CLASS – Fall Break		
	Oct 11	NO CLASS – Fall Break		
9	Oct 16	Carbon and Nitrogen Cycles		Ehleringer
	Oct 18	Land Plants	Quiz 3 – Fri, Oct 20	Ehleringer
10	Oct 23	Gymnosperms		Ehleringer
	Oct 25	Angiosperms		Ehleringer
11	Oct 30	Biogeography - Biomes and Global Ecology		Ehleringer
	Nov 1	Fungi	Quiz 4 – Fri, Nov 3	Ehleringer
12	Nov 6	Symbiosis		Ehleringer
	Nov 8	EXAM 2		
13	Nov 13	The Cambrian Explosion & The Origins of Animals		Hoepfner
	Nov 15	Animal Form and Function	Quiz 5 – Fri, Nov 17	Hoepfner
14	Nov 20	Arthropods and Vertebrates		Hoepfner
	Nov 22	Animal Behavior		Hoepfner
15	Nov 27	Sexual Selection		Hoepfner
	Nov 29	Evolution of Hominins	Quiz 6 – Fri, Dec 1	Hoepfner
16	Dec 4	Extinction and Biodiversity in the Anthropocene		Ehleringer
	Dec 6	Human-Ecosystem Relationships		Ehleringer
Finals week	Mon, Dec 11	Comprehensive Exam @ 8:00-10:00am		

University Policies

1. **COVID-19 Campus Guidelines.** The COVID-19 guidelines for the University of Utah are adapted often due to the ever-changing status of the pandemic. For the most up-to-date information regarding the campus guidelines, visit <https://coronavirus.utah.edu>.
2. **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.
3. **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.
4. **Addressing Sexual Misconduct.** 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. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).
5. **Undocumented Student Support Statement.** Immigration is a complex phenomenon with broad impact—those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801-213-3697 or visit <http://dream.utah.edu>.
6. **Drop/Withdrawal.** Students may drop a course within the first two weeks of a given semester without any penalties. Students may officially withdraw (W) from a class or all classes after the drop deadline through the midpoint of a course. A "W" grade is recorded on the transcript and appropriate tuition/fees are assessed. The grade "W" is not used in calculating the student's GPA. For deadlines to withdraw from full-term, first, and second session classes, see the U's Academic Calendar.

7. **Academic Misconduct.** In order to ensure that the highest standards of academic conduct are promoted and supported at the University, students must adhere to generally accepted standards of academic honesty. Acts of academic misconduct include cheating, plagiarizing, research misconduct, misrepresenting one's work, and inappropriately collaborating. Suspected cases of academic misconduct will be dealt with according to the procedures found in the Student Code, University Policy 6-400(V)(<http://regulations.utah.edu/academics/6-400.php>). Instances of academic misconduct will be recorded in a database that may be made available to other University of Utah Departments and Colleges.
8. **Wellness Statement.** 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 at www.wellness.utah.edu or 801-581-7776.
9. **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.
10. **Diversity / Inclusivity Statement.** It is the intent of the instructors that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is our intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let us know ways to improve the effectiveness of the course for you personally or for other students or student groups.
11. **Learners of English as an Additional/Second Language.** 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 us know if there is any additional support you would like to discuss for this class.