THE UNIVERSITY OF UTAH

BIOL 1625 Fall 2023

Sections 001-011

Fundamental Principles of Biology Lab II: Evolution and Diversity of Life

Instructor	Email	Office	Office hours
Adam Rupper, Ph.D.	adam.rupper@biology.utah.edu	CSC 132B	Friday 2-3 pm (or by appointment)

Faculty Specialists

William Brazelton Ph.D.
Bryn Dentinger Ph.D.
Jim Ehleringer Ph.D.
Sarah Bush Ph.D.

BIOL1625 Meeting Times and Location

Section	Day	Time	Location
001	Tues	9:10 – 12:05 AM	CSC 106
002	Tues	12:25 – 3:20 PM	CSC 106
003	Tues	4:35 – 7:35 PM	CSC 106
004	Wed	8:35 – 11:35 AM	CSC 106
005	Wed	11:50 – 2:50 PM	CSC 106
006	Wed	3:05 – 6:00 PM	CSC 106
007	Thurs	9:10 – 12:05 AM	CSC 106
008	Thurs	12:25 – 3:20 PM	CSC 106
009	Thurs	3:40 – 6:40 PM	CSC 106
010	Fri	8:35 – 11:35 AM	CSC 106
011	Fri	11:50 – 2:50 PM	CSC 106

Course Information

Covid 19

Please follow CDC Isolation rules (https://www.cdc.gov/coronavirus/2019-ncov/your-health/isolation.html) if you are experiencing COVID-19 symptoms and/or test positive for COVID-19. There are no grade penalties if you communicate with your TAs and/or Adam Rupper. 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. Testing is still available on campus.

Catalog Course Description

This course introduces the students to experimental strategies for analysis of phylogenetic relationships; organism diversity; the linkage between form, function and behavior; species interactions; and ecosystems services. Prerequisites: C- or better in BIOL 2010 OR corequisites: C- or better in BIOL 1620. This course is 1 credit.

Purpose/Rational for this Course

Biology 1625 is a 1 credit introductory biology lab course for biology majors and pre-professionals and is part of the year-long "Fundamentals in Biology" sequence. The main focus of this course is to provide foundational knowledge and critical thinking skills to prepare students for more advanced biology courses. This course introduces students to natural selection, origins and diversity of life, the relationship between form and function, and the construction and interpretation of phylogenies. High school biology and chemistry knowledge will be expected from students.

*Although concepts are complementary, it is important to remember that BIOL 1625 is a separate class from BIOL 1620, which is why students must register for this course independently.

Course Fee

Registration for this course requires payment of a $40 lab fee. The fee is used to buy lab supplies and equipment for this course.

Text and Instructional Materials

1. Specific supporting background material will be provided by your instructor.
2. Students will maintain an electronic lab notebook using LabArchives. Instructions for setting up notebooks will be provided on the first day of lab.
3. You will need access to a computer with internet to complete and submit online assignments. It will often be useful to bring a computer to lab. Computers are available at each lab bench.

Learning Outcomes

Upon successful completion, students should be able to:

1. develop skills to work in a biology lab and use common biology laboratory equipment and methods.
2. to think like a biologist and be able to recognize broad patterns and develop critical thinking.
3. to understand the scientific method i.e., observe, ask questions, design hypotheses, make predictions, design experiments, conduct experiments, collect data, record and organize data, analyze data, draw conclusions and communicate your findings
4. develop skills to present scientific findings in the form of figures, data summaries, formal scientific writing, and oral presentations.
5. 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.

Communication Plan

All course materials, such as lecture slides, assignments, solutions, grades, etc. will be posted on the course Canvas site. Class announcements will be done via email through the Canvas server. Should you have questions or concerns please contact the lab teaching assistants or your instructor through email. Contact information can be found in this syllabus or on Canvas.

Course Expectations and Organization

This course will be organized in up to four modules. Each module will follow basic outline below:

Week 1 Introduction to concepts and to appropriate lab techniques.
Students pose hypotheses and design an appropriate experimental or comparative approach to address their hypotheses.

Week 2 Students test hypotheses by collecting relevant data.

Week 3 Collection of additional data, if appropriate.
Data analysis.
Communicate findings (e.g., oral presentation).

During Lab: Each lab session will be coordinated by a teaching assistant trained extensively by the instructor. Students will lead their own research project using guidelines provided by your instructors. Hands-on experimentation and problem solving will be an integral part of your lab work. It is expected that each student will follow the guidelines explained to you by the TA and follow the course policies listed below. Each student is expected to record lab activities in a lab notebook which will periodically be reviewed by instructors. In addition, as the lab is a shared research space, it is critical that we maintain a clean and organized lab space.

After Lab: After each lab students will submit graphs, tables, or summaries of experiments as described by you instructor.

How to Succeed in This Course (Course Requirements)

As your instructor, I will do everything I can to help you achieve your goals, but I can only provide opportunities to succeed. If you are having problems in class, please come talk to me, the supplemental instructor from the academic development center, or visit the Student Learning Collaborative center in person.

Keys to success

1. Come to class and arrive on time.
2. You will need a laptop computer you can bring to class, or another device that enables you to write and connect with canvas. If you don't have one, you can check one out from the Marriott Library for the semester https://lib.utah.edu/coronavirus/checkout-equipment.php. Always bring your computer to class. There will often be time you can use to work on assignments with lab mates or TAs.
3. The Canvas site for the class always contains the most up to date course information and should be checked regularly for assignments, due dates, announcements, changes, etc.
4. Assignments must be turned in on time. While there are some group assignments, most assignments must be turned in individually. For example, lab notebook assignments must be submitted to Canvas by each individual student.
5. You are responsible for your education and are responsible for your own work. Not only is it your responsibility to do the work required of you for the class, but you should be constantly assessing yourself and discovering what you know and do not know. It is also your responsibility to seek help from fellow students and the instructor when you need it.

Assessment

Grade Component	Percent

Attendance and Étiquette	15%
Lab assignments and presentations	55%
Notebook	30%

Attendance and Etiquette

Attendance in lab is required. Each unexcused absence (absence with no explanation) results in missing the points for that week and the necessary information for the experiments. Please communicate with your instructor if you are unable to attend class and arrange to make up missed material. Students should follow appropriate safety protocols and general lab rules. You will not be penalized for missing lab due to illness, however you *must* communicate with your TAs and your instructor ASAP to negotiate accommodations.

Students are required to maintain a respectful and safe learning atmosphere. This includes establishing good communication with your lab partners and treating your lab partners with respect. All students will be provided with the rules detailing the behavioral, ethical, and safety policies of this course both during the first week and through information provided on the course Canvas site. Violations of safety policies will result in an automatic deduction of points or a failing grade (severe violations) based upon the instructor's judgment. Being prepared for lab each week is part of safety and etiquette. Failure to be prepared for lab will result in a reduction of points for that day.

Lab Assignments and Presentations

There will be numerous graded and ungraded assignments completed both in class and at home to help you learn the material, assess your own understanding of the material, and reinforce information gained from lab. All assignments are designed to help your learning process and actively completing them will positively influence your understanding and in turn, your grade. Reading materials either before or after class as assigned is required and necessary to successfully complete course assignments.

At the end of each module, you will present your results in a variety of formats. You must be present to receive points for a group presentation. If you cannot be present, you must (IN ADVANCE) negotiate an accommodation with your instructor. Please see Canvas for rubrics and instructions for these activities.

Late submission policy: Without prior permission, assignments submitted late will receive a 10% deduction per day late. If you are going to be late submitting an assignment due to unforeseen circumstances, please get permission from your TA or instructor. No assignment will be accepted ten days after its due date without prior agreement of your instructor (Dr. Rupper). You MUST negotiate an accommodation with your instructor before the ten day late window is closed.

Regrade requests: You must submit a regrade request form to Dr. Rupper within two weeks of an assignment being graded/made visible to students. Requests received after 2 weeks from when the assignment was graded will not be considered.

Quizzes

There are various quizzes on topics of importance that will be **Due Before** the lab period that those topics are discussed. You have three attempts to take these quizzes, but you will receive an average score between those attempts. Please prepare accordingly before taking the quizzes. Correct answers will only be given after the third attempt. **Late submission policy does NOT apply to quizzes.** If you miss a quiz due to unforeseen circumstances, contact your TA or instructor. Requests received ten days after the due date will not be considered.

Lab Notebook

Your LabArchives notebook is the most important record of your research. Guidelines and rubrics for lab notebooks are posted on Canvas. When working in the lab with your group, one person will act as the scribe and record data in their LabArchives notebook. This data belongs to the course and must be shared with group members whether they were present that day or not. This data cannot be deleted or altered after it has been acquired. While you will work with lab partners and share notebook data through LabArchives, you MUST turn in an individual copy of your notebook assignments through Canvas to get credit for each assignment. Late submission policy applies to lab notebook assignments.

Grading Scale

A 93-100%	B- 80-82%	D+ 67-69%
A- 90-92%	C+ 77-79%	D 63-66%
B+ 87-89%	C 73-76%	D- 60-62%
B 83-86%	C- 70-72%	E 0-59%

Standard rounding practices will be used. 92.5% will round to an A.

University Policies and Student Resources

1. 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. Center for Disability Services.

a. Given the nature of this course, 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.

2. 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

3. 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).

4. Drop/ Withdrawal Last day to add, drop (delete), elect CR/NC, or audit classes 9/1/23. Last day to withdraw from classes 10/20/23.

5. Other important information to consider including:

a. Student Code: http://regulations.utah.edu/academics/6-400.php

b. Accommodation Policy (see Section Q): http://regulations.utah.edu/academics/6-100.php

6. 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 Student Wellness Center; 801-581-7776.Code of Student's Rights and Responsibility http://www.regulations.utah.edu/academics/6-400.html
7. Veterans Center
8. LGBT Resource Center

9. Academic Conduct

a. 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.

ADDITIONAL STUDENT RESOURCES ARE POSTED ON CANVAS

Fall 2023 Schedule

	Class Topic
Module 1	Form, function, and diversification of plants. Quantifying stomatal density and distribution; exploration and analysis
Module 2	Generation of phylogenies using DNA barcoding
Module 3	Effects of urbanization on the Jordan River watershed: bacterial loads
Module 4	The role of mutation in evolution: Lederberg Replica Plating

Session	Date	Class Topic
Session 1	Aug 21-25	Syllabus/ Safety/ Lab Archives
Session 2	Aug 28- Sept 1	Stomata Intro/ How to Use Microscope
Session 3	Sept 4-8	Stomata Data Collection/ Analysis
Session 4	Sept 11-15	Stomata Presentation/ Phylogeny Intro/ How to Use Pipettor
Session 5	Sept 18-22	Phylogeny DNA Extraction/ PCR
Session 6	Sept 25-29	Phylogeny Agarose Electrophoresis/ Phylogeny Sequence Prep
Session 7	Oct 2-6	Watershed Introduction
No Class	Oct 9-13	FALL BREAK!!
Session 8	Oct 16-20	Phylogeny Sequence Analysis/ Watershed Plate Water
Session 9	Oct 23-27	Phylogeny Presentation/ Watershed Plate Counts/ Watershed Antibiotic Resistance/ Mutation Start Cultures
Session 10	Oct 30- Nov 3	Watershed Presentation/ Mutation Intro/ Mutation Plate Cultures/ Mutation Plate Cell Counts
Session 11	Nov 6-10	Mutation Plate Replica Plate/ Mutation Plate Cell Counts Data
Session 12	Nov 13-17	Mutation Replica Data Acquisition

No Class	Nov 20-24	Thanksgiving!!
Session 13	Nov 27-Dec 1	Mutation Presentations
No Class	Dec 4-7	Short Week!

The syllabus is subject to change. Any changes will be posted on the course Canvas website.