

**BIOL 350 AND 350L: PLANT ECOLOGY, EVOLUTION, AND DIVERSITY + LAB
COURSE GUIDE AND POLICIES: FALL 2024**

DESCRIPTION: Plants have evolved a stunning diversity of forms and reproductive strategies, occupy some incredibly challenging ecological niches, and form the basis of food chains and human economic systems. This course surveys plant types emphasizing morphology, reproduction, ecology, geography, and the evolution of major groups. This includes examining water relations, photosynthesis, respiration, and plant-soil and plant-animal interactions that determine the relationships between plants and their physical and biological environments. This course will also explore the history of plant use in society, including the evolving relationships between humans and plants as food, medicine, fuel, fibers, and dyes. Laboratories will involve original research design, data analysis, discussion of literature, presentation of ideas in a variety of formats, and field-oriented components stressing plant identification, ecology, and systematics.

PREREQUISITES: BIOL 201, BIOL 202, BIOL 203, and corequisite labs.

INSTRUCTOR:

Dr. Robert G. Laport

Email: rlaport@collegeofidaho.edu

Office: Boone 221A

Phone: 208-459-5292

Visiting hours: **Tu 10:30a-11:30a, Th 11:00a-12:00p, F 10:00a-12:00p** and by appointment. All students should visit with me at least once during the semester.

COURSE TEXTBOOK: Reading assignments will greatly aid your understanding of the concepts. Unless otherwise indicated, you are responsible for all reading assignments as indicated on the syllabus. A portion of all worksheet and exam questions will relate to the reading assignments. Textbooks can be expensive and difficult to obtain in a hurry, but an electronic version of this text is available for rent if you wish. **If you need assistance obtaining the text, please reach out to me confidentially so that I can help ensure you are able to access the text.**

Evert, R. F., and S. E. Eichhorn. 2013. *Raven Biology of Plants* (8th Ed.). W.H. Freeman and Company, New York.

CANVAS: We will use Canvas for this course (canvas.collegeofidaho.edu). The syllabus/policy, learning objectives, handouts, assignments, article readings, and announcements will be posted here. Check Canvas often, particularly to ensure that you are aware of upcoming due dates and exams, and also to keep track of your grade in the course.

PLICKERS: We will use Plickers (“Paper Clickers”) as a classroom response method in this course. You will use your assigned barcode to respond to formalized in-class questions and quizzes. Responses will count toward your final grade, so be sure to take note of your barcode number and bring your barcode every class and lab period. You may download a replacement barcode on Canvas or at www.plickers.com.

ACCESSIBILITY RESOURCES AND SERVICES: My goal is to create an accessible, equitable, and inclusive classroom. The College of Idaho seeks to provide an educational environment that is accessible to the needs of students with disabilities. The College provides reasonable services to enrolled students who have a documented permanent or temporary physical, psychological, learning, intellectual, or sensory disability that qualifies the student for accommodations under the Americans with Disabilities Act or section 504 of the Rehabilitation Act of 1973. If you have, or think you may have, a disability that impacts your performance as a student in this class, you are encouraged to arrange support services and/or accommodations through the

Department of Accessibility and Learning Excellence located in McCain 201B and available via email at accessibility@collegeofidaho.edu. Reasonable academic accommodations may be provided to students who submit appropriate and current documentation of their disability. Accommodations can be arranged only through this process and are not retroactively applied. More information can be found on the DALE webpage (<https://www.collegeofidaho.edu/accessibility>)

COMMITMENT TO DIVERSITY: The College of Idaho and The Biology Department are committed to creating an academic climate that is safe and respectful of all students, staff, and faculty regardless of race, ethnicity, sexual orientation, gender identity, age, size, socioeconomic background, religion, spirituality, physical ability, mental ability, or any other aspect of one's identity. A climate of mutual respect allows us to ask difficult questions and to participate in honest discussions, even in the context of strong disagreement. Creating this kind of open, honest, and respectful climate is our mutual responsibility. The Biology Department is continually seeking to understand how students and faculty—particularly those from historically excluded groups—experience our classrooms, and to provide actionable resources to support teaching approaches that promote equity and foster a sense of belonging. I encourage you to reach out to me or other Faculty in the Biology Department with any concerns or ideas you may have.

SEXUAL MISCONDUCT DISCLOSURE: I will do my best to help any student who comes to me with concerns. For emergencies, call 911 and/or Campus Safety at x5151 or (208) 459-5151. All faculty members are mandated to report any incidents of sexual misconduct that comes to their attention. The College has specific confidentiality and anti-retaliation protections in place. Health and Wellness Center Staff and the College Minister can advise you confidentially. Also, the Title IX Coordinator (Jodi Nafzger; titleix@collegeofidaho.edu; (208) 459-5139) can help you access other resources on campus and in the local community. The Sexual Misconduct Policy and other Title IX information can be found on the College website at: <https://www.collegeofidaho.edu/about/offices/human-resources/sexual-misconduct>.

GRIEVANCES: A student who has a grievance with any aspect of this course should meet with me to discuss the problem. If an honest and sincere dialogue cannot resolve the grievance, the student may make an appointment to discuss the problem with the Biology Department Chair as the appropriate next step.

SCHEDULE: This four-credit course meets twice weekly (**Tu & Th 9:25-10:40 am**) in **Boone 216**. The required associated lab meets once weekly (**Th 1:40-4:20 pm**) in **Boone 203 or the Herbarium (announced in advance)**.

CLASS ATTENDANCE: Students must be registered by the end of the Drop/Add period to attend class (see academic calendar: <https://iq2prod1.smartcatalogiq.com/en/Catalogs/College-of-Idaho/current/Undergraduate-Catalog/The-College-of-Idaho-s-2022-2023-Academic-Calendar>). Regular attendance is integral to success in this course and is expected of every student. In the event of an absence, in-class handouts and slides will be provided. Notes must be obtained from a classmate. Students requiring accommodation for conflict(s) (e.g., major religious holidays, health issues) should notify me privately at the beginning of the semester or as soon as possible. Non-accommodated absences from more than two class periods is considered excessive and experience shows decreased course performance with increasing absences.

LABS: Labs will sometimes be outdoors—rain or shine—so come prepared with sturdy shoes, long pants, jacket, rain gear, warm jacket, gloves, water, snacks, sunscreen, insect repellent,

etc. Extremely inclement weather may lead to a change in the schedule, perhaps at short notice. If there is a change, I will email the class by noon on lab day. Make sure to check your email, but if you are unable to do so, have a fellow lab member contact you about lab changes.

This is an advanced course. Expect to spend a substantial amount of time on experimental design, collecting data, writing exercises, and completing assignments for this course. The lab focuses on experimental design, collecting, analyzing, and presenting real data. Some aspects may be tedious, others challenging. As in the world outside campus, some experiments will go as planned and others will not. When procedures do not produce expected results, we will think about possible causes and may design new experiments to test some possibilities.

Though some formal lab times are set aside for you to work on independent projects, you will need additional time outside of scheduled lab meetings to complete your projects. The skills you learn in this course will help lay a foundation for Ecology & Evolutionary Biology and Environmental Studies and Sciences graduate programs, and careers in natural resources, wildlife management, data analytics, health careers, and will also provide a foundation for conducting ecology and evolution-focused research.

NOTEBOOKS: Lab/Field Notebooks represent a “diary” of your activities and observations, and are essential for both laboratory and field settings. Notebooks are used to record data, as well as your first thoughts on ideas, chance unrelated (at the time) observations, and explanations for results. A good notebook should be understandable to others as well as you at a future time. Thus, it is essential that your notebook be legible and organized. Because we may experience inclement weather or experiments that could “soil” your notebook, I recommend a bound notebook with water resistant paper (one example: https://www.riteintherain.com/4-625x7-stapled-notebook#cover-colors_black_page-patterns_universal#771FX)

You will need to bring your notebook to class/lab every day. The details of what to record and how to do so will vary from person to person, but some general suggestions:

Lab Notebook:

1. At the beginning of each experimental section, include a short description of the purpose of the experiment. State the hypotheses that you are testing and at least one particular result would not be consistent with the hypothesis. Learn to state your hypotheses, verbally and on paper.
2. Outline the experiment, as a flow chart or cartoon (not necessarily repeating the lab handout!). Note what data is to be collected and what kind of layout you are going to use to record it. What kind of check can you do in the lab to confirm that things are working? What are the controls? Steps 1 and 2 should be done before the lab period.
3. During the lab period, everything you write should be in the notebook (notes and tables of results, including ad hoc figures that you might use). Do not record on paper towels and then recopy to obtain a neat notebook. Think before you write. Your lab notebook should also contain additional notes about the experimental details so that you could use your notebook and the handout to reproduce the experiment with much less supervision and with greater security about its success than in your first run-through. For example, a lab handout might indicate only that a gel should be run until the dye reaches about 2/3 of the way to the bottom. By recording the % gel, voltage/amperage, and running time, you can compare results from experiment to experiment.
4. After the lab, initial analysis: the rough figures and calculations that you might do when you start your analysis of the results.
5. Any time, ideas for repeating the experiment to get better results ...or, if the experiment was unsuccessful, repeating the experiment

Field Notebook:

1. For each day you collect field data, record the date, time, location, weather conditions, and names of people you are working with.
2. Record any notable or interesting observations, even if you aren't sure if they directly relate to your current study. For example, if you are measuring trees and notice a lot of woodpecker activity, make note of this. Or, if a

plot is near a wetland, or looks “odd” in some way, note this. These observations can help interpret your data, and they can provide ideas for future projects.

3. Record data clearly. Be sure the meaning of all abbreviations is clear. Do not mix tic marks and numbers (“||” can be “11” or “2”).

4. At the end of every activity, provide a brief summary of questions being asked, what you did, why you did it, and any preliminary results.

ABSENCE ACCOMMODATIONS: Reasonable accommodations and flexibility will be afforded to students who must be absent from class or lab because of religious holidays, college-sponsored activities, etc. Students are asked to privately identify all course conflicts at the beginning of the semester or well in advance of known absences.

CAMPUS CLOSURES, INTERNET OUTAGES, AND OTHER BARRIERS TO NORMAL INSTRUCTION.

In the event that the College is closed unexpectedly for inclement weather, or any other reason, students should expect a missed exam to be given during the next regularly scheduled class period. Similarly, widespread power or internet outages may also result in adjustments to the course and exam schedule. No oral presentations or exams will be administered prior to the scheduled times.

PROFESSIONALISM: It is expected that students adhere to the Honor Code and display a professionalism in class similar to that expected in the workplace. This pertains to attendance, respect for others, engagement, organizational skills, initiative, responsiveness to feedback, personal responsibility, interpersonal skills, independence, quality of work, and communication.

ASSESSMENTS: Late assignments will be marked down 10% per week. Consult with Dr. Laport in advance if you anticipate an excused absence.

Reports, Worksheets, and Clicker Questions (35%): Students will be assigned several worksheets, written, and oral reports designed to reinforce material covered in class and lab. These activities will provide practice for developing reasoning and problem-solving skills, and verbal and written communication skills. The lowest of these scores will be dropped.

Seminars and Final Project (15%): An important aspect of academic pursuits is to attend seminar presentations by active researchers to learn about new scientific findings. **All students should plan on attending at least two (2) seminars in the Natural Sciences and Mathematics Colloquium, and submitting short summaries and interpretations for each presentation that mirror the reading worksheets on Canvas.** Seminars will be announced in class, via email, and on Canvas.

Students will collectively complete research projects deriving from activities in the lab portion of this course. Assistance will be provided, but this is your opportunity to develop and present research in plant ecology and evolutionary biology. Successful projects require: 1) background research into the specific topics being investigated, 2) oral or written presentation to the class of your hypothesis, experimental design and final results.

Midterm Exams (35%): Two midterm exams each valued at 15% of the total grade will be administered during the semester (see class schedule). Questions will be a combination of multiple choice, true/false, fill-in-the-blank, and short answer. Also included will be a Tree ID Quiz.

Final Exam (15%): A cumulative final will be administered during finals week (**12 December 8:30a-11:00a**). Questions will be a combination of multiple choice, true/false, fill in the blank, and short answer.

GRADES: Letter grades will be assigned as follows based on cumulative performance:

GRADE BREAKDOWN:

>93.3% = A	80.0-83.3% = B-	66.7-69.9% = D+
90.0-93.3% = A-	76.7-79.9% = C+	63.4-66.6% = D
86.7-89.9% = B+	73.4-76.6% = C	60.0-63.3% = D-
83.4-86.6% = B	70.0-73.3% = C-	< 60.0% = F

INCOMPLETE GRADES: Administration of an incomplete is at the discretion of the instructor. The grade of I (Incomplete) may be assigned when a student has met all of the following conditions:

The student has attended class through the final withdrawal date in accordance with the course attendance policy. The last date of attendance should occur after the withdraw deadline.

The student has completed the majority of possible coursework at the point in time and is in good standing, having earned C- or better.

When the instructor believes the student's inability to complete the course is due to legitimate causes beyond the student's reasonable control (such as an illness or traumatic event occurring after the final withdrawal date).

The instructor and student must submit an Incomplete Grade Contract to the Registrar's Office before the last day of finals in the semester in which the student is registered for the course. Final approval for the incomplete is at the discretion of the Registrar, providing that the student meets the conditions listed above. All work for the course must be completed by the first week of the following semester.

ACADEMIC HONOR CODE SYSTEM AND ACADEMIC DISHONESTY: I aim to create a supportive, collegial, and intellectually encouraging environment in my courses. The College of Idaho maintains that academic honesty and integrity are essential values in the educational process. Operating under an Honor Code philosophy, the College expects conduct rooted in honesty, integrity, and understanding, allowing members of a diverse student body to live together and interact and learn from one another in ways that protect both personal freedom and community standards. Violations of academic honesty are addressed primarily by the instructor and may be referred to the student Judicial Board:

<http://collegeofidaho.smartcatalogiq.com/current/Undergraduate-Catalog/Policies-and-Procedures/Academic-Misconduct>

Academic dishonesty is defined as the use of unauthorized assistance with intent to deceive, or to misrepresent the work of another as their own, in meeting course and degree requirements. Academic dishonesty consists of plagiarism, cheating, fabrication and falsification, multiple submission of the same work, misuse of academic materials, and complicity in academic dishonesty (see below). All work in this class is to be completed independently, unless otherwise indicated. Non-compliance will result minimally in a grade of zero for that effort, documentation of the episode, and disciplinary action as set forth by College policy, with penalties ranging from failure of this course to dismissal from the College.

Examples of academic dishonesty include, but are not limited to:

- A. Plagiarism:** Plagiarism is the use of another person's distinctive words or ideas without acknowledgment. Examples include:
1. Word-for-word copying of another person's ideas or words
 2. The mosaic (interspersing of one's own words here and there while, in essence, copying another's work)
 3. The paraphrase (rewriting of another's work, yet still using their fundamental idea or theory)
 4. Fabrication of references (inventing or counterfeiting sources)
 5. Submission of another's work as one's own
 6. Neglecting quotation marks on material that is otherwise acknowledged
- NOTE: Acknowledgment is not necessary when material used is common knowledge.
- B. Cheating:** Cheating involves the possession, communication, or use of information, materials, notes, study aids or other devices not authorized by the instructor in an academic exercise, or communication with another person during such an exercise. Examples include:
1. Copying from another's paper or receiving unauthorized assistance from another during an academic exercise or in the submission of academic material
 2. Using a calculator or other electronic device when its use has been disallowed
 3. Collaborating with another student or students during an academic exercise without the consent of the instructor.
- C. Fabrication and Falsification:** Fabrication involves inventing or counterfeiting information, i.e., creating results not obtained in a study or laboratory experiment. Falsification, on the other hand, involves the deliberate alteration of results to suit one's needs in an experiment or other academic exercise.
- D. Multiple Submissions:** This involves submitting work for which academic credit has already been earned, when such submission is made without instructor authorization.
- E. Misuse of Academic Materials:** The misuse of academic materials includes, but is not limited to:
1. Stealing or destroying library or reference materials or computer programs
 2. Stealing or destroying another student's notes or materials, or having such materials in one's possession without the owner's permission
 3. Receiving assistance in locating or using sources of information in an assignment when such assistance has been forbidden by the instructor
 4. Illegitimate possession, disposition, or use of examinations or keys to examinations
 5. Unauthorized alteration, forgery, or falsification
 6. Unauthorized sale or purchase of examinations, papers, or assignments
- F. Complicity in Academic Dishonesty:** Complicity involves knowingly contributing to another's acts of academic dishonesty. Examples include:
1. Knowingly aiding another in any act of academic dishonesty
 2. Allowing another to copy from one's paper for an assignment or exam
 3. Distributing test questions or information about test materials before the assessment
 4. Taking an exam or test for someone else
 5. Signing another's name on attendance roster or on an academic exercise

EXAMPLE STRATEGIES FOR SUCCESS: Following are suggestions that students have found useful in the past for ensuring success in this course:

- Review your notes shortly after each lecture or lab— the sooner the better. Rewrite them, or at least annotate them. Write down all questions and have an instructor address them during the next class period.
- Read assignments promptly. Each week you will be responsible for substantial readings. Set aside one or two hours each week to complete the readings. Interact with your texts. Write in them! Highlight them!
- Once you have read the syllabus, enter “Barbara McClintock” in the response field for the bonus quiz on canvas before the second meeting of class for two bonus points
- Form a study group of your peers for regular, if only brief, meetings.
- Utilize office hours and appointments. Come prepared with questions

Date	Topic	Assessment	Text	Important Events
Week 1 22 Aug	Plant Awareness Disparity: are you experienced?			
Week 2 27/29 Aug	What are plants made of?		Chapters 2-3	28 Aug Drop/Add Without Instructor Permission Ends
Week 3 3/5 Sep	What are plants made of?		Chapters 2-3	2 Sep Labor Day 4 Sep Census Date Drop/Add Period Ends
Week 4 10/12 Sep	How do plants make a living?		Chapters 6-7, 23, 30	
Week 5 17/19 Sep	How do plants make a living?	Exam I (19 Sep)	Chapters 6-7, 23, 30	
Week 6 24/26 Sep	Some plants have sex, others don't		Chapters 8, 17, 18, 19	
Week 7 1/3 Oct	Some plants have sex, others don't		Chapters 8, 17, 18, 19	
Week 8 8/10 Oct	Plants evolve (and they are really good at it, too)!		Chapters 8, 11, 12, 20	
Week 9 15/17 Oct	Fall Break		Chapters 8, 11, 12, 20	16 Oct Mid-Term Grades Due
Week 10 22/24 Oct	Plants evolve (and they are really good at it, too)!			
Week 11 29/31 Oct	Plants live together (Ecology: Biomes & Communities)	Exam II (31 October)		
Week 12 5/7 Nov	Plants live together (Ecology: Biomes & Communities)			
Week 13 12/14 Nov	Plants live together (Ecology: Biomes & Communities)			
Week 14 19/21 Nov	Country plant, town plant (Plants & Society)		Chap. 21	18 Nov Withdraw Period Ends

Week 15 26/28 Nov	Country plant, town plant (Plants & Society) Fall Recess (28 Nov)			28-29 Nov Fall Recess
Week 16 3/5 Dec	Country plant, town plant (Plants & Society)			
Week 17 9-13 Dec	Final Exams	Comprehensive Final 12 December @ 8:30a		18 Dec: Final Grades Due

TENTATIVE LAB SCHEDULE		
Date	Topic/Activity	Activity Due Dates
Week 1 22 Aug	Plant seeds & begin plant diary - peas, beans, corn Plant Fast Plant seeds - start reading and thinking about traits for artificial selection	
Week 2 29 Aug	Netting bees & recording plants	All Night Streetlights Worksheet
Week 3 5 Sep	Plant-pollinator interactions	Schlanger_Plant Intelligence
Week 4 12 Sep	Bee DNA Extractions	Hardwood Forest and Earthworms Worksheet
Week 5 19 Sep	Bee COI PCR Reactions	Ehrenberg_How to Define a Tree
Week 6 26 Sep	Bee DNA Barcode IDs	Campus Tree ID Quiz
Week 7 3 Oct	Bee Phylogenetics	Air Pollution Makes it Harder for Bees to Smell Worksheet
Week 8 10 Oct	Plant-pollinator presentations & native plant list	
Week 9 17 Oct	Fall Break	Fall Break
Week 10 24 Oct	Ecological niche modeling: Climate change	Herbivores Promote Tree Habitat Specialization Worksheet
Week 11 31 Oct	Ecological niche modeling: Climate change	Woodruff_Bioluminescent Petunias

		Lapointe_Houseplant Engineered to Remove Air Pollution
Week 12 7 Nov	Ecological niche modeling: Climate change	Pollan_Botany of Desire_Marijuana
Week 13 14 Nov	Ecological Niche Modeling: Climate Change	
Week 14 21 Nov	Ecological Niche Modeling: Posters	How Planting Trees Affects Climate Change Worksheet
Week 15 28 Nov	Fall Recess	
Week 16 5 Dec	Ecological niche model poster presentations	
Week 17 9-13 Dec	Final Exams	Final Exams