BIOL 3085: RESEARCH METHODS & TECHNIQUES
COURSE GUIDE AND POLICIES: JANUARY 2026

DESCRIPTION AND LEARNING OUTCOMES: This lab-based course will focus on exploring concepts, building skills, and implementing hands-on techniques used by biologists to investigate biological diversity. Along the way, we will also discuss primary literature to investigate why studying biodiversity matters, and how we interact with biodiversity in daily life.

Students completing this course will:

1. Implement and troubleshoot fundamental molecular laboratory protocols for the characterization of biodiversity including DNA extraction of plant tissue, Polymerase Chain Reactions, and pre-Sanger sequencing clean-up reactions
2. Hone gel electrophoresis techniques
3. Understand multiple biodiversity concepts employed by biologists and how to quantify biodiversity
4. Explain relationships between groups of organisms that influence population dynamics
5. Understand and apply the scientific process including developing questions and hypotheses, implementing appropriate tests for hypotheses, and appropriately interpreting outcomes
6. Interpret quantitative data and models to explain pattern and process in biology and develop science communication skills
7. Demonstrate understanding of the consequences of human actions on biodiversity

INSTRUCTOR:

Dr. Robert G. Laport — Email: rlaport@collegeofidaho.edu
Office: Boone 221A — Phone: 208-459-5292
Visiting hours: Tu 11:30a-1:30p, Th 11:30a-1:30p, 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 and techniques we will use in this course. Unless otherwise indicated, you are responsible for all reading assignments as indicated on the syllabus.

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, but you may also keep track of your grade in the course.

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, accessible, 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 M, T, W, Th 9:00a-11:30a in Boone 203.

CLASS ATTENDANCE: Students must be registered by the end of the Drop/Add period to attend class (see academic calendar: https://collegeofidaho.smartcatalogiq.com/en/current/undergraduate-catalog/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.

Though some formal class time will be set aside for you to work on group projects, you will need additional time outside of scheduled class meetings to complete your projects

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 day. Consult with Dr. Laport in advance if you anticipate an excused absence.

PRE/POST-TEST (5%): Determined only on completion.

PARTICIPATION (50%): Students will be assigned several preserved plant samples to work with. All students are expected to conduct DNA extractions, Polymerase Chain Reactions (PCRs) using primers for two chloroplast loci, pre-sequencing clean-up, DNA sequence analyses, and a brief written report. Students are also expected to engage with assigned readings and to participate in class discussions designed to reinforce material covered in the course.

TEAM PROJECT (45%): Students will be assigned several preserved plant samples to work with and analyze as noted above. All justifications and important steps in handling, processing, and analyzing samples must be recorded in a notebook. Students will develop a team project relevant to topics in the course. Assistance will be provided, but this is your opportunity to express some independence in the practice of science. Hopefully, this course will motivate your own questions or a subject that you want to explore in depth. Let's discuss how to do it!

Projects require: 1) development of a proposal based upon prior research (approved prior to proceeding), 2) presentation to the class of your hypothesis, experimental design and anticipated results, and 3) 10 min. oral presentation of your final results, 4) poster presentation at the Spring Student Research Conference.

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, including AI-generated responses (e.g., ChatGPT and similar generative AI). If you elect to use AI, you must cite the model as you would for any other reference, but it is also contingent upon you to justify why AI shouldn't just be employed to do the job you are hoping to attain upon graduating from the College.
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!
- Silence or turn off your phone and put it away where it will not distract you during class and when studying.
- Enter "Barbara McClintock" in the text box for the bonus on Canvas before the second meeting of class to indicate that you have read the syllabus.
- Form a study group of your peers for regular meetings, even if only brief.
- Utilize office hours and appointments. Come prepared with questions.

TENTATIVE SCHEDULE

Date	**Topic**	**Assessment**	**Reading**	**Important Events**
Week 1 5-9 Jan	Welcome Survey *Castanea dentata* natural history, blight, evolution, restoration DNA Extractions Polymerase Chain Reaction	5 Jan: Concept Inventory Pre-Test	https://en.wikipedia.org/wiki/American_chestnut The American Chestnut Foundation: https://tacf.org/ The American Chestnut Research & Restoration Project: https://www.esf.edu/chestnut/index.php Check Canvas for Primary Literature	7 Jan: Drop/Add Ends
Week 2 12-16 Jan	Polymerase Chain Reaction	12 Jan: Research Question & Hypothesis		
Week 3 19 Jan: MLK Holiday 20-23 Jan	Polymerase Chain Reaction Pre-Sequencing Clean-ups	20 Jan: Research Report Outline		20 Jan: Withdraw deadline 20 Jan: P/F deadline
Week 4 26-29 Jan	Send clean PCRs for sequencing (Azenta/GeneWiz)? Sequence editing, alignment? Population genetic analyses?	27 Jan: Research Reports Due 29 Jan: SRC Poster Draft 24 Jan: Concept Inventory Post-Test		4 Feb: Final grades due