

**BIOL 200: EVOLUTION WITH LAB
POLICY AND COURSE GUIDE: FALL 2018**

DESCRIPTION: Evolution is the grand unifying idea of biology. This study of the evolutionary process will include discussion of the genetic mechanisms of variation, natural selection, change in populations, speciation, coevolution, hominid evolution and biogeography, as well as applications of evolutionary biology to real-world problems. The history of evolutionary ideas from before Darwin to the present will also be covered. Laboratories will involve original research design, data analysis, discussion of a many types of literature and presentation of ideas in a variety of formats.

PREREQUISITES: BIOL 1, BIOL 1 Lab, BIOL 2, BIOL 2 Lab.

INSTRUCTOR:

Dr. Robert G. Laport

Office: FJ 170

Office Hours: TuTh 9:30-10:30 and by appointment. All students are expected to meet with Dr. Laport at least once during the semester.

Email: laportr@rhodes.edu

Phone: 901-843-3558

REQUIRED TEXTS: Reading assignments are not optional. 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.

Zimmer, C., and D. J. Emlen. 2015. *Evolution: Making Sense of Life* (2nd Ed.). Roberts and Company Publishers, Englewood.

MOODLE: We will use Moodle for this course (moodle.rhodes.edu). The syllabus/policy, learning objectives, handouts, assignments, article readings, and announcements will be posted here. Check Moodle often, particularly to ensure that you are aware of your grade to date.

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 (see below), so be sure to bring your barcode every class and lab period.

ACCESSIBILITY RESOURCES AND SERVICES: Students requiring accommodation should contact the Office of Student Accessibility Services (www.rhodes.edu/accessibility; Burrow Hall, 4th Floor, 901-843-3885, TTY 901-843-3018) as soon as possible.

SCHEDULE: This four-credit lecture course meets twice weekly (TuTh 8:00-9:15 am) in FJ-D. The required associated one-credit lab meets once weekly (Th 12:30-3:30 pm) in FJ-165.

CLASS ATTENDANCE: Students not registered by the end of the Drop/Add period (see academic calendar: <http://catalog.rhodes.edu/catalog/academic-calendar-2018-2019>) will not be allowed to attend class. Regular attendance is integral to success in this course and is expected of every student. In the event of an absence, lecture handouts will be provided. Lecture notes must be obtained from another student. Students requiring accommodation for conflict(s) (e.g., major religious holidays) should notify Dr. Laport at the beginning of the semester. Absence in more than two lecture periods is considered excessive.

LABS: Sometimes labs will be held outdoors—rain or shine—so come prepared with sturdy shoes, long pants, jacket, rain gear, warm jacket, water, snacks, insect spray, 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 “real world,” 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 graduate programs and 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.

You will need to bring your notebook to class/lab everyday. 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 that could disprove 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 ad hoc analysis 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 data collectors.

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 are clear. Do not mix tick marks and numbers ("II" 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 will be afforded to students who must be absent from class or lab because of religious holidays, college-sanctioned activities, etc. Students are asked to privately identify all course conflicts at the beginning of the semester or well in advance of known absences.

ABSENCES AND CAMPUS CLOSURES. 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. The course schedule will be adjusted for a missed lecture or lab. No oral presentations or exams will be administered prior to the scheduled times.

PROFESSIONALISM: It is expected that students adhere to the Honor System and display a professionalism in class similar to that expected in the workplace. This pertains to attendance, 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 (20%): Students will be assigned several worksheets, written reports, and reading reports designed to reinforce material covered in lecture and lab. These activities will provide practice for developing reasoning and problem-solving skills, and verbal and written communication skills. The lowest of these score will be dropped.

INDEPENDENT PROJECT (20%): Students will develop an independent research project relevant to topics in the course as part of the lab. Assistance will be provided, but this is your opportunity to develop and test an idea that you conceive. If you have a question that you have always wanted to explore in depth, let's discuss how it could be tested. Projects can begin at any time in the semester, but a proposal must be made by the scheduled date (below). Field studies, dependent on being outdoors, will likely need to be started earlier in the semester than lab or computer-based studies due to seasonal changes.

Projects require: 1) development of a proposal (approved prior to beginning data collection), 2) presentation to the class of your hypothesis, experimental design and anticipated results, and 3) 10 min. oral presentation of your final results.

MIDTERM EXAMS (40%): Two midterm exams each valued at 20% of the total grade will be administered throughout the semester (see class schedule). Questions will be a combination of multiple choice, true/false, fill in the blank, and short answer.

FINAL EXAM (20%): A cumulative final will be administered during finals week (TBA). 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:

Reports, Worksheets, Clicker Questions: 20%

Independent Project: 20%

Midterm Exams: 40%

Cumulative Final Exam: 20%

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 (X) are not granted for low academic performance. Administration of an incomplete is at the discretion of the instructor. To be eligible for an Incomplete Grade, a student must have (1) successfully completed 75 percent of the course with a “C” or higher, (2) have special circumstances (verification may be required) that preclude the student from attending class and completing graded assignments (e.g., illness), and (3) make arrangements to complete missing assignments with the original instructor by the fourth week of the following semester. A course completion agreement must be filed with the Registrar.

HONOR SYSTEM AND ACADEMIC DISHONESTY: It is assumed that all students are familiar with the policies delineated in the Academic Handbook. As members of the Rhodes College academic community, faculty and students accept the responsibility of maintaining the highest standards of intellectual honesty and ethical conduct consistent with the Honor System (below). 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.

COMMITMENT TO DIVERSITY: Rhodes College 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.

SEXUAL MISCONDUCT DISCLOSURE: I will do my best to help any student who comes to me with non-course related concerns. Please keep in mind, however, that all faculty members are mandated to report any incidents of sexual misconduct that comes to their attention. That means that I cannot keep information about sexual misconduct confidential from the college if you share it with me, but the college has specific confidentiality and anti-retaliation protections in place. The Rhodes Counseling Center, the Student Health Services Staff, and the College Chaplain can advise you confidentially. Also, the Title IX Coordinator (Ms. Tiffany Cox) at x3354 can help you access other resources on campus and in the local community. The student Sex/Gender Discrimination and Sexual Misconduct Policy and other Title IX information is in the Student Handbook, and can be found on the website at: <http://handbook.rhodes.edu/title-ix>.

GRIEVANCES: A student who has a grievance with any aspect of this course should meet with me during office hours (not via e-mail or phone) 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.

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!
- Form a study group of your peers for regular, if only brief, meetings.
- Utilize office hours and appointments. Come prepared with questions.

TENTATIVE LECTURE SCHEDULE				
Date	Topic	Assessment	Text	Other Important Events
Week 1 Aug. 23	Natural Philosophy to Darwin and Beyond	Concept Inventory Pre-Test	Chaps.1-2	
Week 2 Aug. 28/30	Constructing the Tree of Life		Chap. 4	8/28 Enrollment Clearance Ends Drop/Add Period Ends
Week 3 Sep. 4/6	Geology and the History of Life		Chap. 3	
Week 4 Sep. 11/13	Raw Material of Evolution	Worksheet 1 Due (Tree Thinking)	Chap. 5	9/12 Pass/Fail Period Ends Extended Drop Period Ends
Week 5 Sep. 18/20	Raw Material of Evolution	Exam I (20 September)	Chap. 5	9/19 Last day to Remove Conditional Grades
Week 6 Sep. 25/27	Mechanisms of Evolutionary Change		Chap. 6	
Week 7 Oct. 2/4	Mechanisms of Evolutionary Change		Chap. 6	

Week 8 Oct. 9/11	Quantitative Genetics		Chap. 7	10/12 Mid-Term Grades Due
Week 9 Oct. 16/18	Fall Recess (16th) Natural Selection and Adaptation	Worksheet 2 Due (Population Genetics)	Chaps.8-10	
Week 10 Oct. 23/25	Natural Selection and Adaptation		Chaps.8-10	10/26 Withdraw Period Ends
Week 11 Oct. 30/ Nov. 1	Natural Selection and Adaptation	Exam II (1 November)	Chaps.8-10	
Week 12 Nov. 6/8	The Origin of Species		Chap. 13	
Week 13 Nov. 13/15	The Origin of Species		Chap. 13	
Nov. 20/22	Macroevolution Fall Break (22nd)		Fall Break	
Week 14 Nov. 27/29	Macroevolution	Worksheet 3 Due (Selection & Adaptation)	Chap. 14	
Week 15 Dec. 4/6	Evolution of Sex Reading Day (6th)	Concept Inventory Post-Test	Chap. 11	
Week 16 Dec. 7-12	Finals Week	Comprehensive Final (Dec. 11 @ 8:30a)		12/14 Final Grades Due

TENTATIVE LAB SCHEDULE			
Date	Topic/Activity	Due Dates	Papers to Read/ Important Links
Week 1 Aug. 23	Phylogenetics & Co-speciation		
Week 2 Aug. 30	Pipetting Skills SimBio (Snails & Crabs)		
Week 3 Sep. 6	Phylogenetics & Co-speciation	Spider Evolution Questionnaire	Yong 2018, Spider Evolution on Hawaii
Week 4 Sep. 13	Phylogenetics & Co-speciation	SimBio (Snails & Crabs) Due	
Week 5 Sep. 20	Goldenrod & Galls (alternative: Phylogenetic Ancestral State Reconstruction)	Beating Dengue with Wolbachia Questionnaire	Yong 2016, Beating Dengue with Wolbachia
Week 6 Sep. 27	Goldenrod & Galls (alternative: Phylogenetic Ancestral State Reconstruction)		
Week 7 Oct. 4	Yeast Multicellularity		snowflakeyeastl ab.com Campbell- Staton et al. 2017
Week 8 Oct. 11	Yeast Multicellularity	Campbell-Staton et al. 2017 Questionnaire	

Week 9 Oct. 18	Yeast Multicellularity	Stopping the Rise of Superbugs Questionnaire	Yong 2017, Stopping the Rise of Superbugs
Week 10 Oct. 25	Ecological Niche Modeling/Niche Evolution		
Week 11 Nov. 1	SimBio (Finches & Islands)	Independent Project Proposals You are Probably Descended from Royalty Questionnaire	Rutherford 2017, You are Probably Descended from Royalty
Week 12 Nov. 8	Independent Projects	SimBio (Finches & Islands)	
Week 13 Nov. 15	Independent Projects		
Nov. 22	Fall Break	Fall Break	
Week 14 Nov. 29	Independent Project Presentations		
Week 15 Dec. 6	Reading Day	Reading Day	
Week 16 Dec. 7-12	Finals Week	Finals Week	