Ecology (BIOSC 0370/0390)
Summer 2019 (Session 1: 5/13–5/31)
Lecture: M–F 9:00 until ~11:30 AM
Lab: M–F ~1:00 until ~4:30

## I. INSTRUCTOR INFORMATION

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Office Hours: TBD each week (in person and also via Skype)

## II. COURSE MATERIALS

1. Required book for lecture: Ricklefs & Relyea, *Ecology: The Economy of Nature* (7th edition)
2. Required field notebook for lab: "Rite in the Rain" notebook (provided by PLE)
3. Supplemental Documents: Available as PPTs and PDFs on the course Google Drive

## III. COURSE LOGISTICS

*1. Course Description and Goals*

Ecology is the study of the relations of organisms to one another (i.e., populations and communities of organisms) and to their surrounding physical environment. This course will focus on organismal biology, populations of organisms, communities of different species, and ecosystems.

Upon completion of this course, you should: (1) understand mechanisms of evolution via natural selection; (2) be able to identify major biomes and the properties that define them; (3) understand why some organisms live in certain places but not others; (4) recognize the ways in which species interact with one another; (5) master modern laboratory techniques used to study ecology; (5) further develop your critical thinking skills by reading and discussing primary scientific literature; and (6) design, execute, and present the results from ecology experiments.

2. *Content*
   a. Lectures. During the morning session (9:00 AM until approximately 11:30 AM), the course will follow a typical lecture-based course during which I will lecture on various topics (see the schedule below). My lectures will highlight what I feel are the core ideas relating to a particular topic in the textbook. I will not have an opportunity to cover every item in a particular chapter and I have even skipped some chapters. Although my exams will not cover any material that is not presented in my PPTs (or in a scientific paper that we read/discuss in class), you might find it useful to read content that I have not lectured on.

   b. Discussions. On a few occasions, we will have group discussions during class in lieu of a lecture. During class, we will critically discuss a published scientific paper that serves as a case study for a particular topic. This means that you need to have read the paper at least 2x prior to coming to class. For each paper, half of the class will serve as ***advocates*** for the paper and the other half of class will serve as ***disputants*** for the paper. During the first 20 minutes of the paper discussion, all of the ***advocates*** will break into a subgroup and come to a group consensus on the strengths of the conceptual/theoretical framework for the paper, the hypotheses/predictions, and the

experimental design/approach. During this time, the ***disputants*** will discuss the group consensus on the weaknesses of the paper (conceptual or experimental), alternative explanations of the results, and any other critiques related to the science of the paper. Each group will informally present the strengths and weaknesses of the paper (approximately 5 minutes per group). We will then spend the remainder of the class period discussing the paper and relating it to topics that we've covered in lecture.

c. Laboratory Activities. The majority of our time each class will be spent doing laboratory work (and most of these will be in the field). The field component of the course is designed so that you have opportunities to see and practice some of the concepts that you will learn about in class. We will occasionally do laboratory activities inside, but I've tried to keep this to a minimum (assuming that you elected to take an ecology course from a field station because you wanted to be outside!). All laboratory activities will be conducted in small groups of 4–6 students. Almost all of the data from individual laboratory groups will be compiled into a larger dataset. **The techniques learned in, and the results collected from, laboratory activities are fair game on examinations.**

d. Group project. During the final week of the course, each lab group will conduct a small laboratory experiment. We will discuss the details of this project in class.

## IV. LECTURE TOPICS

| Date | Topic | Chapter/Supplemental Reading |
|---|---|---|
| Mon 5/13 | evolution & natural selection | Ricklefs & Relyea, Ch. 7 |
| Mon 5/13 | aquatic biomes and adaptations | Ricklefs & Relyea, Ch. 6 & 2 |
| Tues 5/14 | terrestrial biomes & adaptations | Ricklefs & Relyea, Ch. 6 & 3 |
| Tues 5/14 | life history | Ricklefs & Relyea, Ch. 8 |
| Wed 5/15 | size & scale | |
| Wed 5/15 | metabolism | |
| Thrs 5/16 | population distributions | Ricklefs & Relyea, Ch. 11 |
| Thrs 5/16 | population growth & regulation | Ricklefs & Relyea, Ch. 12 |
| Fri 5/17 | **EXAM 1 (5/13–5/16)** | |
| Fri 5/17 | population dynamics | Ricklefs & Relyea, Ch. 13 |
| Mon 5/20 | predation & herbivory | Ricklefs & Relyea, Ch. 14 |
| Mon 5/20 | parasitism | Ricklefs & Relyea, Ch. 15 |
| Tues 5/21 | competition | Ricklefs & Relyea, Ch. 16 |
| Tues 5/21 | mutualism | Ricklefs & Relyea, Ch. 17 |
| Wed 5/22 | community structure | Ricklefs & Relyea, Ch. 18 |
| Wed 5/22 | community succession | Ricklefs & Relyea, Ch. 19 |
| Thrs 5/23 | Presque Isle introduction | |
| Fri 5/24 | **EXAM 2 (5/17–5/23)** | |
| Fri 5/24 | experiment planning period | |
| Mon 5/27 | **MEMORIAL DAY — NO CLASS** | |
| Tues 5/28 | movement of energy in ecosystems | Ricklefs & Relyea, Ch. 20 |
| Tues 5/28 | Movement of elements in ecosystems | Ricklefs & Relyea, Ch. 21 |
| Wed 5/29 | scientific paper discussion | SR 1 |
| Wed 5/29 | landscape ecology & biodiversity | Ricklefs & Relyea, Ch. 22 |

| | | |
|---|---|---|
| Thrs 5/30 | conservation ecology | Ricklefs & Relyea, Ch. 23 |
| Thrs 5/30 | scientific paper discussion | SR 2 |
| Fri 5/31 | **FINAL EXAM (5/24–5/30 & cumulative)** | |

## V. LABORATORY SCHEDULE

| Date | Topic | Location |
|---|---|---|
| Mon 5/13 | aquatic lab 1: streams | Linesville Creek |
| Tues 5/14 | aquatic lab 2: wetlands and ponds | Bousson Environmental Preserve (Meadville, PA) |
| Wed 5/15 | terrestrial lab 1: coniferous forests | PLE housing site |
| Thrs 5/16 | terrestrial lab 2: deciduous forests | Tryon-Weber Woods |
| Fri 5/17 | human demography | Linesville cemetery |
| Mon 5/20 | parasites: ticks and snails | PLE |
| Tues 5/21 | competition: testing the ideal free distribution | Spillway |
| Wed 5/22 | aquatic invertebrate lab | Indoor lab @ PLE |
| Thrs 5/23 | community succession | Presque Isle State Park (Erie PA) |
| Fri 5/24 | terrestrial invertebrate lab | Indoor lab @ PLE |
| Mon 5/27 | **MEMORIAL DAY — NO LAB** | |
| Tues 5/28 | group experiment planning period | |
| Wed 5/29 | group field experiments | TBD |
| Thrs 5/30 | group field experiments | TBD |
| Fri 5/31 | group research presentations | |

## VI. ASSESSMENT

There are 370 points available in the lecture portion of the course. I will assess your performance by examinations and participation in discussions of scientific papers. Each of the two midterm exams is worth 100 points and the non-cumulative portion of the final exam is also worth 100 points. These examinations will consist of a mix of multiple choice question, short answer, and essays/problem solving questions. There is a cumulative portion to the final exam that is worth 50 points (all essay and/or short answer). Lastly, you can earn a total of 20 points for your participation in the discussion of scientific papers (10 points each x 2 papers).

There are 240 points available in the laboratory portion of this course. I will assess your performance by two laboratory reports, the research presentation of your group project, and by daily participation in the laboratory activities. Your first lab report on the human demography lab is worth 25 points. This lab report is strictly a Methods and Results lab report. You can choose the topic of your second lab report: streams, ponds, coniferous forests, or deciduous forests. This laboratory report is worth 75 points. ***When preparing your laboratory reports, you can include figures that you generated while work with your group members but the written portion of the laboratory report must be done individually.*** Each person in every lab group can choose their own topic for the 2nd lab report. Each group will also present the results from their group experiment (worth 50 points). Lastly, you can earn up to 90 points for your participation in the daily laboratory activities.

## VII. GRADING SCALE

The following scale will be used to convert your percentage (the total # of points earned / the total number of points available) into a letter grade:

| | | |
|---|---|---|
| >97% A+ | 80-82 B- | 63-66 D |
| 93-96 A | 77-79 C+ | 60-62 D- |
| 90-92 A- | 73-76 C | <59% F |
| 87-89 B+ | 70-72 C- | |
| 83-86 B | 67-69 D+ | |

## VIII. Additional Information

1. *Late Assignments:* There are two laboratory reports due in this class. You must bring a printed copy of each of these to class on the dates specified above. Failure to do so will result in a 10% point reduction per day late. Lab reports will not be collected after 9:00 AM on Friday of the week that they are due and you will earn a 0 on that assignment.
2. *Laboratory Presentation:* All group members earn the same grade on the group presentation. The only exception is that if you do not show up to, or participate in, the group presentation. Failure to do so will result in a 0 on that assignment.
3. *Attendance and Participation in Lecture and Lab:* Although I will not formally take attendance, I expect that you attend class and actively participate. Class discussions or laboratory activities cannot be replicated and thus cannot be made up, **even if you have an excused absence**. You are adults and I trust your judgement when deciding if you need to miss a class/lab because you are sick. Please email me as soon as possible and simply let me know that you will not be in class because you are sick (and no, I don't need to know why).
4. *Missed Quizzes and Exams:* Missed examinations cannot be made up.
5. *Cheating and Plagiarism*: Cheating/plagiarism will not be tolerated. Students enrolled in courses at PLE are expected to abide by the academic integrity policies of both the University of Pittsburgh and, where applicable, the other institution through which they enrolled. Students suspected of violating either or both institutions' policies will be required to participate in the procedural process outlined therein. A minimum sanction of a zero score for the quiz or exam will be imposed.

Academic integrity policies can be found at the links below:
University of Pittsburgh: www.cfo.pitt.edu/policies/policy/02/02-03-02.html
Clarion: http://www.clarion.edu/student-life/student-affairs/conduct-policies-andjudicial-services/student-code-of-conduct/academic-integrity-policy.html
Chatham: https://www.chatham.edu/academics/catalog/2017-2018/HonorCode/
Edinboro: http://www.edinboro.edu/directory/offices-services/social-equity/commoncourse-policies.html
IUP: https://www.iup.edu/graduatestudies/catalog/university-policies/academicpolicies/academic-integrity-policy-and-procedures/
Slippery Rock: http://catalog.sru.edu/content.php?catoid=22&navoid=437#acad_inte

6. If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the PLE Program Administrator, 814-273-0416 as early as possible to determine reasonable accommodations for this course.