Spring 2020
Biology 3301 Syllabus
Experiential Learning in Ecology and Evolution
Class: Mon 4:00-5:00PM(NH 040), Wed&Fri 8:30-11:20AM(CSI407)

Instructor
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Office Hours: Tue 10:30-12:30pm, Wed 1:00-3:00pm, Additional hours by appointment

Teaching Assistant
TBD

Course Description
This is a field-based, inquiry-driven course designed to teach study design and science communication for ecology and evolution with an emphasis on field-based techniques. The objectives of the course are for students to gain hands-on experiences with organisms in the field; develop the skills, techniques, and methods of analysis required to conduct biological field studies; communicate the results of scientific studies; and gain an appreciation for natural history. This course will enhance students' ability in critical thinking in the context of their upper division courses in ecology and evolution.

This course is set up to be a sampler of many different types of questions, and techniques used to answer them, in ecology and evolution. This means we will cover lots of ideas in a short amount of time. You will go more in depth with some of these questions and techniques with your independent inquiry projects. We will also refine our tools for formal science writing and oral communication.

Students will conduct guided-inquiry projects utilizing approaches such as the use of keys for identifying organisms, capture and marking of individuals, or using GIS/GPS to describe spatial distributions. Students will also learn sampling techniques to assess various ecological factors, including population size, demography, community composition, behavior, morphology, abiotic characteristics, and physiology. Students will additionally maintain field notebooks, manage and curate data, consider ethics and scientific misconduct, and conduct statistical analyses.

Prerequisites: One upper-level Area B Biology course in the ecology and evolution area (3420 through 3435) or Microbiology (Biology 3458). A statistics course is highly recommended.

Course Structure: Students will be required to participate in *1-2 overnight field trips* held Friday to Saturday. Students should anticipate long hours of intensive learning (and possible camping). We will often have to get up early, follow tight schedules, and work outdoors in adverse environmental conditions. Positive attitudes are a must in fieldwork! Fieldwork can often result in fun unexpected encounters, so stay alert!

Students will be required to complete 6 hours/week in lab (Wednesday & Friday) and 1 hour weekly in recitation (Monday). Students will be expected to maintain projects outside scheduled laboratory sections. Wednesday will be "in class" work time, structured as a workshop while your instructor is available to help. Students will have extensive homework assignments, designed to be worked through during the class period. Work can be done out of class.

Biology Learning Outcomes:

- Students will be able to design an effective ecology or evolutionary study with proper controls and statistical power.
- Students will be able to appropriately collect and interpret scientific data from the field.
- Students will be able to effectively communicate scientific ideas and findings using written, oral, and visual presentations.
- Students will be able to relate ecology to daily life and connect concepts across studies

Oral and Visual Communication Learning Outcomes:

- identify and use the elements of effective oral and visual communication.
- create and deliver effectively structured oral presentations using language correctly and appropriately.
- use visual media that are effective, appropriate, and well-integrated into the presentation.
- analyze and critique oral and visual components of presentations
- respond effectively to questions and comments from audience members.

Readings:
Assorted reading will be posted on course webpage

Course Schedule
The schedule for class meetings is provided online. Please note that we will be moving between lecture/discussion and activity on a regular basis. Being prepared will allow us to have more meaningful discussions addressing any questions that arose from the assigned reading(s).

Please note that this schedule is subject to change. You will be notified of any alterations in class, or via e-mail.

Assessment:

1)Field Journal - 10%
2)Seminar and Reflections Journal - 10%
3)Homework - 20%
4)iNaturalist entries - 5%
5)Participation - 10%
6)Oral presentation: results from faculty led field-trip project - 5%
7)Written proposal - 5%
8)Oral presentation: design pitch for independent project - 5%
9)Oral presentation: independent project's finalized Introduction and Methods - 5%
10)Mock poster presentation - 5%
11)Final Poster - 10%
12)Final Paper - 10%

Late work will not be accepted without prior consent of instructor.

1) Field Journal: You will be expected to maintain a professionally formatted field notebook (in a composition notebook) which will be graded twice during the course of the semester. Instructions on notebook requirements will be posted.

2) Seminar and Reflections Journal: Students will also be expected to maintain a seminar journal which will identifying key points of the biology seminar, and will also provide a description of both the productive and unproductive oral and visual communication techniques utilized by seminar speakers (e.g., the organization of the presentation, the speaker's communication skills). More instructions to follow.

For the reflections part of the journal (use the latter half of the same composition notebook). Because people don't get outside much anymore, we experience a disconnect between our daily lives and the world outside. In an effort to develop your observation skills and to practice recognizing connections between ecology and daily life, you will find a place outside and stay for 20 minutes each week (with your phone off!). More instructions to follow.

3) Homework assignments: You will have weekly homework assignments to be completed before each Friday session. These assignments will help you practice skills learned in class. Most weeks you will be able to work on them during the Wednesday session, where I will be in attendance to help and answer questions. You may consult each other but your finished assignment should be completed individually unless otherwise instructed.

4) iNaturalist entries: use this app to take pictures and identify at least 70 insects from 10 different taxonomic orders.
5) Participation: read and be able to discuss assignments, be an active member of the class both during class meetings and on fieldtrips.

6) Oral Presentation: Report your field-trip based research project, analyses, and findings (15-20 min presentation, teams of 4-5 students).

***7*) Written Proposal:** A team of two will be expected to identify appropriate literature, develop a hypothesis and specific aims and present a feasible experimental plan and analysis strategy.

8) Oral Presentation: Design pitch for independent project (5-7 min presentation, teams of 2 students).

9) Oral Presentation: Finalized Introduction and Methods for independent project (7-15 min presentation, teams of 2 students). This is where you receive final feedback (from instructor, and from peer reviewers) before you start collecting data for your independent project.

10) Mock Poster Presentation: The team of two will develop a research conference style poster based on their research project. Students will present the poster in a mock session and receive feedback on contents and mechanics.

11) Poster Presentation: The final poster presentation will be a public presentation and held jointly with the other Experiential Learning class.

12) Final Paper: The team of two will write a completed formal paper with an Abstract, Introduction, Methods, Results, and Discussion. There will be overlap between your poster and final paper.

My teaching philosophy
I am here to help you to develop skills that will assist you in learning throughout your academic and professional careers. To that end, please feel free to ask questions inside or outside of class if there is something you don't understand. My goal is to provide a supportive community for your learning.

My office hours
It is best to come see me during my scheduled office hours. During office hours I can give you my undivided attention and I will work with you one-on-one to solve problems and help you to better understand material or assignments. If you cannot make it during office hours, you may schedule an appointment in advance.

My email policy
I check my email ~ 2 times per day (approx. at noon and 4pm), so please do not expect immediate responses to your emails. I will try to respond within 24hrs. **NOTE: I rarely check email on weekends.** Email communication should only be used to address quick and easy-to-address questions. More difficult or involved questions should be addressed in person (during class, during office hours).

Courtesy
Please show common courtesy: (1) Be prepared for class and arrive on time, (2) Avoid conversations with others during class, (3) Limit food and beverages to those that can be consumed quietly, (4) Turn off cell phones and other devices before class.
Note that the use of laptops for note-taking is acceptable; HOWEVER, there should be no surfing, chatting, email checking, facebooking, etc. during class.

Attendance:
Regular class attendance is expected as discussion and group activities will be routine. Attending and participating in class will both help you focus your efforts to study the material presented in the readings and will cover material not addressed in the assigned texts. Excused absences will need documentation and class activities will need to be completed with one week of absence.

Honor Code
All students are covered by a policy that prohibits dishonesty in academic work. Under the Honor Code, a faculty member will (or a student may) report an alleged violation to the Academic Honor Council. It is the task of the Council to investigate, adjudicate, and assign a punishment within certain guidelines if a violation has been verified. **Students are required to pledge all written work that is submitted for a grade: "On my honor, I have neither given nor received any unauthorized assistance on this work" and their signature. The pledge may be abbreviated "pledged" with a signature.**

File Sharing

With this statement, I specify that any materials created by your instructor to enhance or assess your learning in this class (including but not limited to examinations, exam keys, problem sets, lecture slides, and clicker questions) are proprietary materials that may not be shared with anyone without prior authorization from the instructor. Sharing these documents in any way is a violation of the Trinity University Honor Code and infractions will be reported to the Honor Council. The sale or donation of these materials to any organization that, as a business or community service, provides study aids is included in this policy. This includes providing materials to such organizations over the

internet. Further, the illicit use of materials obtained from such organizations or individuals is also a violation of the Honor Code and will be reported to the Honor Council. In addition, examinations, exam keys, problem sets, lecture slides, and clicker questions are intellectual property governed by copyright laws. Sharing these materials without authorization is a violation of these laws. Obtaining such materials is also a violation of copyright laws.