BIO 306: Ecological Methods (1 Cr.)

Instructor: Dr. Sarah A. Orlofske
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Office: TNR 446
Office Hours: Mon & Tues 1:00PM – 3:00PM, Thurs 11:00AM-12:00PM, and by appointment.

Required Text and Materials:

-*Field & Lab Methods for General Ecology* (Brower et al.) 4th edition (rental)
-Access to R statistical software FREE DOWNLOAD (http://mirror.las.iastate.edu/CRAN/) and available in campus computer labs

Course Meeting Days/Times Monday 9:00-11:50 & 3:00-5:50
Tuesday 5:00-7:50

Location: TNR 460

Course Objectives: To study and apply a variety of methods used to conduct and interpret ecological studies of populations, communities, and ecosystems, and to explore fundamental concepts in ecology via both theoretical approaches and hands-on activities.

COURSE POLICIES

Communication and course documents: In addition to our interactions in class, I will frequently use email and D2L as a means of sharing information. While taking this course, I expect that you check your email and D2L on a regular basis.

Attendance: This course includes significant collaboration and we only meet once/week. Therefore, on-time attendance is mandatory. You will drop one-half of an entire course grade for each unexcused absence. Excused absences are restricted to documented, verifiable, extraordinary situations (e.g., university sanctioned events, extreme illness or other emergent medical situations, deaths in the family, etc.). Timely communication with me about such absences is key. I reserve the right to consider significantly late arrivals (i.e., > 15 minutes late) as absences. Note that if you miss a class it is your responsibility to obtain missed information/data from one of your classmates.

Late Policy: Assignments lose 20% of their point-value for each day they are late.

Students with Disabilities: I will be happy to help you if you need special accommodations to succeed in this course. Please see Student Disability Services to complete the paperwork required to document your needs and then contact me so that appropriate arrangements can be made. More information can be found here: http://www.uwsp.edu/disability/Pages/default.aspx

Academic Integrity: It is your responsibility to be aware of your rights and responsibilities as a UWSP student. Please take the time to read and understand the information found here (and let me know of any questions): http://www.uwsp.edu/stuaffairs/Documents/RightsRespons/SRR-2010/rightsChap14.pdf

Grading: To determine your final grade, the following metric will be used:

≥ 94%	90-93%	87-89%	84-86%	80-83%	77-79%	74-76%	70-73%	67-69%	60-66%	≤ 59%
A	A-	B+	B	B-	C+	C	C-	D+	D	F

Activity/Assignment	**Points**
Scientific Papers (Online and In-class Discussions) 4X10	40
R-Tutorial	5
Inferential Statistics Pre-lab	5
Questions, Hypotheses & Experimental Design	10
Lab assignments/reports 9X15	135
Final Paper (Long-Term Research Project)	40
Exam	30
TOTAL	265

I will return graded material WITHIN 2 WEEKS from the assignment due date. If you believe I've made a mistake in grading your work, you must bring your concern to my attention within one week of receiving the graded assignment. I will not reconsider the assigned grade after one week.

☛ **Your grade at the end of the class will be based solely on the assignments and exams turned in up to and including the final. No extra projects, no re-submissions, no re-takes or no extra credit will be given to raise a grade no matter how close you are to the next letter grade. Please do not ask; the answer will be no. In addition, attending tutoring or office hours will help improve your understanding but will not be considered when assigning grades.**

EXPECTATIONS

You are expected to be an active participant in all of our meetings and activities. This means that I expect you to take notes, engage in discussions, ask questions, share thoughts and opinions, and volunteer to help each other out when appropriate.

ASSIGNMENTS

Scientific Paper Reading and Discussion: Scientific articles are a primary means of scientific communication. These assignments are designed to help students learn to interpret and understand scientific literature as well as gain exposure to the primary source of information. Each student will read, comment, and critique scientific papers throughout the course through discussion forums in D2L and in class. All students are required to make comments on the paper ahead of class and come prepared with discussion questions. In class, the focus of the discussion will be on the topics and content of the articles and of the boarder issues in terms of ecology.

Simulations and Mathematical Analysis: Many laboratories, in-class activities, and the course research project will depend on the use of computer simulations, spreadsheets, equations, and statistical analysis. Students should expect to use technology effectively to generate and/or analyze data. Assessments include preparing graphical results and interpreting the results biologically. These are the same tools used by professionals in the field of ecology.

Field trip: You will be outdoors for several hours during field exercises. Wear clothes that are warm (many layers work best) and that can get wet/dirty. Field trips will not be cancelled due to cold/hot weather or light rain- only if there is lightning or dangerous conditions. Check D2L on the morning of a field trip if you suspect it may be cancelled.

Final Exam: The exam will consist mostly of essay questions with some short-answer questions. You must understand how different topics relate to one another. The exams will not only test whether you know the material, but your ability to use what you know to solve problems. You will be required to interpret data presented in graphs and tables and use mathematical formulae.

Research Project & Final Paper: Each student will write ***an individual paper*** based on the data and analysis from the long-term group research project. The papers will be 4-6 double spaced pages and will include at least 3 sources from the scientific literature. The paper will consist of the standard components of a scientific paper including Abstract, Introduction, Methods, Results, and Discussion. More specific information on how to write a scientific paper will be provided in class.

Course Schedule:

Week of:	Activity	Assignment (Due the following week unless otherwise stated in italics)
4-Sep	Labor Day Holiday (Please complete the assignments as a pre-lab for next week's class)	Read sections 1-2 of the statistics tutorial document *Due 9/18/2017:* Complete recording and describing ecological data assignment and complete the introduction to R tutorial.
11-Sep	Intro to experimental design & hypothesis testing in Ecology	Read section 3-6 of the statistics tutorial document and complete the inferential statistics pre-lab Read Background on Ponderosa Pine
18-Sep	Inferential statistics	Ponderosa Pine Lab
		Read Estimating Stream Invertebrate Diversity Part 1
25-Sep	Aquatic Habitat Assessment and Sampling - Outdoor lab	*DUE at the end of lab:* Completed Biomonitoring Habitat & Invert Data
		Read Estimating Stream Invertebrate Diversity Part 2
2-Oct	Species Diversity	Estimating Stream Invertebrate Diversity: Assignment Read Hoverman and Relyea 2012 & Online Discussion
9-Oct	Life History & Population Ecology	*DUE at the end of lab:* Completed questions, hypotheses and experimental design Read Guidelines for Scientific Research Paper
16-Oct	Set up Long-term Research Projects; Finding Sources & Writing Scientific Papers	
23-Oct	Population Estimation	Mark Recapture Assignment Read Sea Turtle Demographics Lab Intro
30-Oct	Demography & Life Tables	Sea Turtle Lab Read Ripple & Beschta 2005 & Online Discussion
6-Nov	Predation	Wolf-Sheep Predation Lab Read Helmus et al. 2014 & Online Discussion
13-Nov	Biogeography	Island Biogeography Simulation Lab
20-Nov	Wrap up long-term research projects; Final data collection and data analysis	*Final paper DUE @ Final Exam* Read Preston et al. 2014 & Online Discussion
27-Nov	Parasitism and species interactions	TIEE Assignment Part 1
4-Dec	Food web ecology	TIEE Assignment Part 2
11-Dec	Final Exam; Final Paper Due	