Ecology: Concepts and Applications EAS 509

COURSE SYLLABUS
University of Michigan ● Winter 2023 ● 4 units

Instructor: Dr. Stella Cousins
scousins@umich.edu

Lecture: Lecture: TTh 8:30-10:00
Dana 1028

Office Hours: Th 10:00–12:00/zoomTBA

Graduate Student Instructor: Sophie Daudon
sdaudon@umich.edu

Labs in Dana 3325:
509-003 Th 4-6 PM
509-002 Fri 9-11 AM

Office Hours: Where: Dana 4046/zoom See Canvas for times

Course Outline
Ecology explores the distribution and abundance of organisms and how living things interact with each other and with their environment. In this course, you will have the opportunity to learn about ecological patterns and the processes generating these patterns. We will demonstrate how important ecological principles can be applied to practical environmental problems.

Course goals: Upon completion of EAS 509, you should be able to:
1) Understand the fundamental principles of ecology and ecological research.
2) Apply ecological concepts and knowledge to the diverse interdisciplinary challenges presented by management of ecosystems and species in our rapidly changing world.
3) Recognize and apply the tools and techniques common to ecological inquiry, including design, analysis, and interpretation of data.
4) Develop, write, and clearly communicate the components of a simple scientific study.
5) Be conversant and confident enough in your ecological knowledge to continue natural sciences education at SEAS and/or on your own.

How we’ll attain these goals:
• By exploring key aspects of ecology including ecosystems, genetics and evolution, physiology, populations and demography, community organization, and landscapes and conservation, with examples from both research and environmental management.
• In lab, through practice evaluating and applying available data sources to analyze and investigate environmental hypotheses and patterns.
• By actively discussing the ideas and issues associated with ecological concepts and their real-world applications; by addressing problems collaboratively and with context.
• Through inquiry-based activities focused on how organisms relate to their environments and affect the movement of energy and nutrients in ecosystems.

Key Materials:
 a. Ecology Schedule Spreadsheet (requires UM authentication): this is a live document updated throughout the term – bookmark and check back frequently!

assign required reading from this edition. Other versions will be similar, though with different pagination.

c. **Interactive Reading Software (Simutext)** Simutext is a software program that facilitates interactive reading, reading comprehension questions, and short lab simulations to practice with ecological ideas. Download and setup instructions will be included with your first assignment. Readings with questions will make up part of your Practice assignments. Interactive reading and questions are preparation for lectures and will be due **before** related material is presented in class.

d. **Additional reading** and media from scientific journals, videos, and news coverage will also be required. Links typically found on the course Schedule.

e. **Recommended book** *Why Ecology Matters* Krebs, Charles. 2016. University of Chicago Press. ISBN 9780226318295 or 022631829X. (New copies ~$30). This very approachable and condensed book covers most of the major concepts in ecology with examples from a variety of disciplines. Assigned chapters will be available on Canvas; additional chapters are optional but provide good examples for the course.

f. **Canvas course page** (https://umich.instructure.com/courses/576205) Canvas hosts all course info and resources, including assigned readings, assignments, lecture notes, and lecture-capture videos. Assignments will be submitted through Canvas; pay careful attention to your notification settings and uploading assignments correctly.


h. **Deeper dives** we’ll frequently provide further information for those curious to learn more!

**Expectations**

**Class participation and work environment:** being present, engaging in class discussions, being attentive, respectful, and punctual, and contributing to a positive learning environment are all expected. I will work to foster an environment where everyone feels safe, welcome, and included, and expect your equal participation in attaining this goal. As professional students, you are also expected to refrain from non-essential personal business during class and lab.

**Academic integrity:** Each person is responsible for completing original work without plagiarizing colleagues or other sources, including during group work. Any information that comes from an outside source **must be fully attributed**; merely altering another person’s wording is plagiarism and will not be permitted. You are expected to **understand what plagiarism is**, both accidental and deliberate, and to be familiar with the [University of Michigan standards](https://www.umich.edu/units/cprogs/tas/services/plagiarism/) on professional academic behavior.

**Lab:** **Attendance at all labs is expected.** Because labs meet only once per week and are especially difficult to repeat, we request that excused absences be avoided if at all possible. Especially for group activities in the second half of the term, your presence is essential for your group to function well. Labs are the best time to meet one-on-one with an instructor and get feedback on your research project.
Attendance: Brief excused absences are allowed for illness/isolation, religious holidays, participation in official university events, job interviews, dependent care, and other emergencies. Excessive unexcused absences will lead to grade deductions as determined by the instructors.

Learning Mechanisms

Class time will be allocated to lectures, discussions, computing-based labs and a group research project. Active participation in class activities and discussion is an important component of this course. In-person participation is preferred when feasible. You are expected to complete a substantial portion of the learning in this course on your own time. This includes reading assignments, problem sets, lab assignments, and developing a research project with your colleagues.

Lectures: It is highly recommended that you attend all lectures. We will be covering important material in the lectures that is not covered in the readings or the labs, and actively discussing course concepts. Material presented in lectures will appear in labs, problem sets, and projects. You are encouraged to make a habit of attending lecture, using lecture videos only for review, illness, or special circumstances. Lectures may be audio/video recorded and made available to other students in this course. As part of your participation in this course, you may be recorded. If you do not wish to be recorded, please contact the instructor to discuss alternative arrangements.

Preparation and Practice: Preparation for class includes regular reading assignments. All reading/media assignments are designed to build a foundation for your understanding of lectures and labs, and are best completed before the material is covered in lecture. You will also be expected to respond to and discuss course content with your peers and the instructor during in-class discussions.

Comprehensive problem sets are intended to test your understanding of key concepts and provide structured practice interpreting and applying ecological ideas. Material from lectures, labs, reading, and in-class activities/discussions will be included. Responses will be multi-format: multiple choice, fill-in-the-blank, and short answer, and data analysis and interpretation. Problem sets are “open book” (you may consult course materials), but must be your own work (400 pts, weekly reading and three problem sets; engagement scored separately.

Labs: Labs are intended to support learning and provide you with the opportunity to connect abstract concepts to patterns in environmental data. Labs are also designed to expose you to different topics and interpretation techniques, which will provide the foundation for your group research projects. Three two-week labs, due the second week of each, and pre-lab skill building (first half of the term, 250 pts total).

Research Project: The group research project is designed to expose you to all of the steps involved in completing scientific research, from generating a research question to completing a scientific manuscript and giving an oral presentation. You are encouraged to begin thinking purposefully about the project from the beginning of the term. Each group will develop a hypothesis based on an ecological topic of interest, then design, implement, and share a short scientific research presentation (mostly second half of the term, 300 pts total in multiple parts).
Evaluation

**Submitting work:** All coursework will be submitted via Canvas unless otherwise noted. Late work will be penalized at -20% per day for two days (48 hours). Work more than two days overdue will not be graded without prior arrangement. Alternate work or altered deadlines will be offered only in extenuating circumstances.

**Grading:** Course engagement and submitted assignments are expected to sum to a total of 1000 possible points. The diagram below shows all major assignments planned at the outset of the course. **Students will also be evaluated for engagement/participation at the conclusion of the course.** Opportunities for additional credit and/or a grading curve may be implemented at any time at the instructor’s discretion; the point total may be adjusted by up to 100 points to allow for additional or alternative requirements.

<table>
<thead>
<tr>
<th>PRACTICE</th>
<th>RESEARCH PROJ</th>
<th>LABS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS2</td>
<td>INTX-EVO</td>
<td>PRE LABS</td>
</tr>
<tr>
<td></td>
<td>INTX-POP</td>
<td></td>
</tr>
<tr>
<td>PS3</td>
<td>INTX-ISELE</td>
<td>LAB 2A</td>
</tr>
<tr>
<td></td>
<td>INTX-ECO</td>
<td></td>
</tr>
<tr>
<td>PS1</td>
<td>INTX-NUT</td>
<td>LAB 3A</td>
</tr>
<tr>
<td></td>
<td>INTX-CCH</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RP ANALYSIS</td>
<td>LAB 2B</td>
</tr>
<tr>
<td></td>
<td>RP PLAN 2</td>
<td>LAB 1B</td>
</tr>
<tr>
<td></td>
<td>RP PEER</td>
<td>LAB 1A</td>
</tr>
<tr>
<td></td>
<td>RP PRESENT</td>
<td>LAB 3B</td>
</tr>
</tbody>
</table>

Resources

**Support for learning differences:** Our aim is to make all course material accessible to everyone. If you need accommodations for a learning difference, please contact the Services for Students with Disabilities (SSD) office at ssdoffice@umich.edu as soon as you can.

**Writing:** Communication is essential to showing your colleagues what you understand. If you want to improve your writing, many services especially for graduate students are available at The Sweetland Writing Center: [https://lsa.umich.edu/sweetland/graduates/writing-workshop.html](https://lsa.umich.edu/sweetland/graduates/writing-workshop.html). You may also be interested in the English Language Institute: [lsa.umich.edu/eli/](https://lsa.umich.edu/eli/)

**Health:** If you face health challenges such as stress, anxiety, depression, or lack of sleep, please don’t wait to seek help. Rackham can help connect you with a variety of support programs: [https://rackham.umich.edu/rackham-life/health/](https://rackham.umich.edu/rackham-life/health/)

**Tips for Success**

I’m lost! Take a breath. Check the course schedule on Canvas. Re-read the syllabus, check with a friend, or ask an instructor for assistance. We are here to help you succeed :).

**Study Suggestions:** In this course, we will be reading & discussing to build a foundation on the topic and applying key concepts during lab and field activities. My advice is to 1) take careful notes, during both reading and lecture and 2) ask questions, whenever the opportunity arises, including office hours. Taking notes by hand is minimally distracting and maximally flexible!