

Ecology CORE Course (EEB 509)

Spring 2018

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Meeting location: 427 Hesler Biology Building

Course schedule: Monday & Wednesday, 2:30-4:30PM
4 credit hours

Office hours: Michael Blum, 485 Dabney Hall
Monday, 12:00-1:00PM and by appointment

Other faculty available by appointment.

Course description

The EEB graduate Ecology and Evolutionary Biology CORE is intended to provide a rigorous introduction to key, or 'core' areas of Ecology and Evolution Biology. Building on the Evolutionary Biology segment of the course, the Ecology segment of the course aims to elevate students' capacity to read and critically evaluate the current literature and to discuss a broad range of topics in Ecology and Evolutionary Biology with visiting speakers, search committees, potential employers, and the like.

The Ecology CORE course is not intended to teach students everything about Ecology. Rather, the aim is for students to develop (1) a foundation of knowledge and confidence upon which to build the specialized knowledge required for individual research programs and (2) the breadth of knowledge necessary to participate in academic science; and to potentially (3) reveal shared interests and thus inspire new collaborations.

Course objectives

This course is intended for graduate students pursuing advanced studies in Ecology and Evolutionary Biology.

Objectives of this course include:

- Increasing students' understanding of the scientific method as well as the development and interpretation of scientific data
- Increasing students' abilities to understand and evaluate scientific controversy
- Increasing students' understanding of the science of Ecology and understanding of specific topics of study, including but not limited to:
 - The origins and history of Ecology as an academic discipline
 - The aims, principles, and frontiers of sub-disciplines, including:
 - Behavioral Ecology
 - Community Ecology
 - Ecophysiology
 - Ecosystem Ecology
 - Evolutionary Ecology
 - Global Change Ecology
 - Quantitative Ecology
 - Population Ecology

By the end of this course, students should have a working knowledge of foundational papers, mathematical models, and current ideas that are motivating further (sub)disciplinary advancement.

- Increasing students' understanding of how the science of Ecology informs other specific topics of study such as human health, public policy, agriculture, energy, urban planning, and sociology.

Learning outcomes

Students taking this course are expected to attain a greater capacity to:

- Identify and describe the principles of Ecology, including theoretical and empirical aspects of sub-disciplines
- Develop and critique logical arguments in Ecology based upon disciplinary and sub-disciplinary principles
- Apply basic knowledge, principles and theories in Ecology to contemporary societal concerns
- Use a variety of quantitative and qualitative techniques- in addition to knowledge of Ecology- to acquire, evaluate, and synthesize scientific evidence

- Communicate scientific evidence and logical arguments through written and verbal formats

Course format

This course covers a series of modules on major conceptual areas in Ecology. Scheduled meetings will include a combination of lectures, discussions, in-class exercises and/or assignments led by EEB faculty.

A strong emphasis will be placed on independent reading. Papers for each module will be made available to students via the course Canvas site. These papers will include both classic 'foundation' papers as well as modern 'frontier' and 'synthesis' papers on key topic areas. Some, but not all, of these papers will be discussed in class. **Students are expected to have read and studied all assigned papers before each meeting.** It is **strongly suggested** that students form reading groups to discuss the papers outside of class time.

Throughout the semester, students will be asked to attend lectures or seminars (e.g., all regularly scheduled department seminars) that are relevant to the topics covered in the course. All students will be expected to keep abreast of current events relevant to the topics covered in the course.

Reading assignments

Reading assignments will be drawn from the primary scientific literature and/or the popular press as noted in the course schedule or during scheduled meetings. Reading assignments will be made available to students in electronic format through the Canvas site for this course, as the semester proceeds.

We will be making extensive use of online resources provided by the Canvas service, so please sign on at your earliest convenience and confirm that you have access to the course's Canvas web page.

Writing project

An important objective of this course is for students to develop greater capacity to undertake and critique ecological research. To meet this objective, individual students or groups of students will be expected to complete a writing project that falls into one of the following categories:

1. ***An observational or experimental (i.e., empirical or mathematical simulation) study*** involving the analysis of *existing* data. The study shall be designed to test an ecological hypothesis derived from (sub)disciplinary principles. The study shall be drafted as a "*brevia*" peer-review article.

2. **A synoptic review (meta-analysis)** of emerging trends or critique of a current controversy in the scientific literature. The paper shall be drafted as a “*letter*” peer-review article.

The objective of this exercise is to draft high caliber peer-review manuscripts formatted for submission to *Science*, *Nature*, *PNAS*, *TREE*, or the like, for publication. Each type of project will involve writing a brief manuscript of 1500-2500 words accompanied by no more than 2 accompanying tables, figures, and/or text-boxes. The article composition- whether it is a study, review or critique- should be comparable to recent publications of similar intent in the peer-review literature.

Timeline:

On January 29, individuals or groups of students will submit a ≤150 word abstract describing their project of choice, accompanied by a list of ≥5 recent and relevant references, to the course coordinator.

On February 19, individuals or groups of students will submit an outline of the paper supported by ≥20 relevant references, to the course coordinator and for peer-review discussion.

On February 21, In-class discussion of paper outlines.

On March 21, individuals or groups of students will submit a first draft of a fully formatted paper to the course coordinator and for peer-review discussion.

On March 26, In-class discussion of first drafts.

On April 23, individuals or groups of students will turn in a final draft to the course coordinator and for peer-review discussion.

On April 25, individuals or groups of students will present a 15-minute seminar on their respective writing project. In-class discussion of final drafts.

Assessment

Assessment for this course will be based on the following:

Participation (40%): Participation during scheduled meetings is an integral part of the course. All students are expected to prepare for and participate in scheduled meetings.

Assignments (15%): In-class and take-home assignments will be given regularly as the semester progresses to assess students’ understanding of course materials.

Writing project (35%): Individuals or groups of students will be assessed based on the completion of a writing project (described above).

Presentation (10%). Individuals or groups of students will be assessed based on the completion of a 15-minute presentation of their writing project (described above).

Written Work: ALL written work will be assessed according to the quality, the facts and arguments presented, as well as spelling, punctuation, and grammar. See below for policies on plagiarism in written work.

Course grades will be assigned according to the following criteria:

For an A grade: Superior participation and attendance. Demonstration of high creativity, initiative, and resourcefulness in all areas of the course. You must achieve an average score of 94% or more across all areas of the course. An A- will be given to those scoring between 90-93%.

For a B grade: Satisfactory participation and attendance. For a B+ you must achieve an average score above 87% across all areas of the course. For a B you must achieve between 84-86%. A B- will be given to those scoring between 80-83%.

For a C grade: Participation and attendance below the standard expected of graduate students. For a C+ you must achieve an average score above 77% across areas of the course, whereas a C will be given to those scoring between 74-76%, and a C- will be given to those scoring between 70-73%.

For a D or F grade: Below an average score of 70% across areas of the course, and poor participation and attendance, where a D+ = 67-69%; D = 64-66%; D- = 60-63%. A D or F constitutes a grade that cannot be used to satisfy degree requirements.

Course policies

All students are expected to:

1. Attend and participate in all class discussions and activities.
2. Read all assignments before coming to class.
3. Complete all in-class and take-home assignments including the course writing project and associated presentation.

No scheduling accommodations for assignments will be made except by prior arrangement for good cause (e.g. official University business, a medically recognized disability, or a death in the immediate family). In all cases you must notify and discuss the need for accommodation with the course coordinator.

Attendance and Lateness: Participation is central to success in this course. If you are absent for 4 or more class meetings without receiving prior consent from the course coordinator, you will not pass the course. Each instance of late arrival is considered as half an absence.

Class Conduct: When discussing the class material and reading, everyone must consider that the course encompasses a diverse group of individuals from various backgrounds and belief systems. It is imperative that we all feel safe to express our views and experiences in an ethical, respectful manner. No form of cultural, ethnic, gender, linguistic, sexual, racial, or religious harassment will be tolerated. Accordingly, please be respectful of those around you during class.

If you act in a way that is disruptive or disrespectful to your fellow classmates or an instructor, you will be asked to leave the class and you will be marked absent.

Cell Phones, tablets and laptops: Please turn off and put away all cell phones and all other small electronic devices unless approval is given for use during an in-class assignment. If you take out your cell phone or if you are observed texting during class, you will be asked to leave immediately and you will be marked absent for the day.

Tablets and laptops may only be used for taking notes during class meeting, or for other approved uses for an in-class assignment. If you are observed using these devices for other purposes during class, you will be asked to leave immediately and you will be marked absent for the day.

Communication: Communication is important. Students are encouraged to establish communication with the course coordinator and instructors concerning any matters with the class, including but not limited to:

- If you are having trouble with any of the material or assignments, if you are falling behind in the class or are having any other problems keeping up with course material
- If you have any other issue arise during the semester that is substantially affecting your performance in the course

Please talk with the course coordinator and/or instructors as early in the semester as is possible to avoid falling behind in the course.

Special accommodations

At the beginning of the semester, any student who feels s/he may need an accommodation because of a documented disability should contact the course coordinator privately to discuss specific needs and contact Student Disability Services at 100 Dunford Hall (website: <https://sds.utk.edu/>; phone: 865-974-6087; e-mail sds@utk.edu) to register for services and coordinate accommodations.

Academic integrity

In all work submitted for academic credit, students are expected to represent themselves honestly. The presence of a student's name on any work submitted in completion of an academic assignment is considered to be an assurance that the work

and ideas are the result of the student's own intellectual effort.

Note on plagiarism: Plagiarism is the use or presentation of another individual's work as one's own without quotation marks or reference to the original source. ***Plagiarism is not allowed under any circumstances whatsoever.***

- Plagiarism includes: (1) Handing in the work of another student with your name on it; (2) Handing in a paper or assignment that includes text taken DIRECTLY from a website or article or book that IS NOT IN QUOTATION MARKS and HAS NOT BEEN CITED OR REFERENCED PROPERLY; (3) very close paraphrasing of published work or another student's work – please pay special attention to this if you work on assignments with another student in this class, and always make sure all your written work is your own and not paraphrasing other students' work. For further clarification:
 - *Unintentional Plagiarism:* Students are often penalized for plagiarism without having even known that they were doing it. The only way to make sure that you never plagiarize unintentionally is to **cite all sources** that you use when completing any written assignment.
 - *Self-Plagiarism:* This is when you do work for one class, then submit it for another class without notifying the instructor. Some professors will allow you to double up your assignments; others will not. If you wish to submit something similar to work you've done or are currently doing for another course, you need to first ask for permission.

Accordingly- in written work, you will be expected to cite references for the information you provide, and any time you quote directly from a source you will be expected to acknowledge the quote and the source. Students suspected of plagiarism will be questioned and asked to provide their sources. **If the instructor believes that plagiarism (in written work) or cheating (on exams) has occurred, the student will be referred to the university administration for further review.**

For further information, consult the "Academic Policies" section of the UT 2017-2018 course catalog and the "Academic Affairs" and "Academic Conduct" sections of the Hill Topics 2017-2018 Student Handbook.

Course content and tentative schedule

Lecture slides, reading assignments and other study aids will be provided on Canvas. Students are encouraged to bring these materials to course meetings. Lecture slides and other materials may be updated following each lecture.

The syllabus and course schedule are subject to change at the discretion of the instructors. Students will be informed of relevant changes during the course.

Week	Date	Topic Area	Lead instructor
One	Jan 10	1 Introduction	Blum
Two	Jan 15	MLK Day	
	Jan 17	2 History of Ecology	Simberloff
Three	Jan 22	3 Evolutionary Ecology- Plasticity	Fordyce
	Jan 24	4 Evolutionary Ecology- Adaptation & Co-evolution	Fordyce
Four	Jan 29	5 Behavioral Ecology- Foundations	Derryberry
	Jan 31	6 Behavioral Ecology- Frontiers	Derryberry
Five	Feb 5	7 Population Ecology- Foundations & Frontiers	Gaoue
	Feb 7	8 Models in Population Ecology	Gaoue
Six	Feb 12	9 Community Ecology- Foundations	Simberloff
	Feb 14	10 Community Ecology- Frontiers	Simberloff
Seven	Feb 19	11 Models in Community Ecology	Fefferman
	Feb 21	12 Discussion of writing projects	Blum
Eight	Feb 26	13 Ecosystem Ecology- Ecosystems & Services	Schweitzer
	Feb 28	14 Ecosystem Ecology- Global & Local Cycles	Schweitzer
Nine	Mar 5	15 Ecosystem Ecology- Microbial mediation of C & N cycling	Schweitzer
	Mar 7	16 Ecosystem Ecology- Ecosystems & Evolution	Schweitzer
Ten	Mar 12	SPRING BREAK	
	Mar 14	SPRING BREAK	
Eleven	Mar 19	17 Ecosystem Ecology- Frontiers	Schweitzer
	Mar 21	18 Models in Ecosystem Ecology	Fefferman
Twelve	Mar 26	19 Discussion of writing projects	Blum
	Mar 28	20 Global Change Ecology- Biological Invasions	Simberloff
Thirteen	Apr 2	21 Global Change Ecology- Forecasting Species Distributions	Papeş
	Apr 4	22 Global Change Ecology- Ecophysiology & Climate Change	Sheldon
Fourteen	Apr 9	23 Global Change Ecology- Socioecology & Cities	Blum
	Apr 11	24 Global Change Ecology- Infectious Disease	Blum
Fifteen	Apr 16	25 Global Change Ecology- Agriculture & Energy	Giam
	Apr 18	26 Global Change Ecology- Restoration	Blum
Sixteen	Apr 23	27 Models in Global Change Ecology	Fefferman
	Apr 25	28 Presentations and discussion of writing projects	Blum