



BISC315L: Introduction to Ecology

4 units

Lecture Meeting days/time: Monday, Wednesday 2:00-3:20pm

Lecture Location: [Zumberge Hall](#) (ZHS) 360

Instructor: Cameron Egan (he/him/his), Ph.D.

Office: AHF 141

Office Hours: Wednesdays 12 pm – 1 pm and Thursdays 11 am – 12 pm

- Office hours are dedicated time for you! My door will be open, and drop-ins are encouraged.
- During these hours I sit and excitedly wait for you to come to chat about biology (or anything you want really)!
- I have availability outside of my scheduled office hours. Please contact me via email to set up an appointment.

Contact Info: camegan@usc.edu

Course Description

An introduction to the different disciplines within the field of ecology. Topics include the ecology of individuals, physiological and behavioral ecology, population ecology, community ecology and ecosystem ecology. Evolution is treated both as a separate unit and throughout the course as a unifying theme. Students will attend a three-hour lab each week to get hands-on experience designing ecological studies, along with the collection, analysis, and interpretation of real-world ecological data.

Lab Meeting days/time: Monday 10:00-12:50pm

Lab Location: [Zumberge Hall](#) (ZHS) 469

Lab Teaching Assistant: Eliza Kirsch

Contact Info: ekirsch@usc.edu

Office: TBA

Office Hours: TBD

Lab Description

Labs will consist of guided inquiry activities designed to introduce you to methods of data collection and analyses of ecological data. A portion of the labs will take place outside (regardless of the weather). Please come prepared to work in the field!

A key component of both the lab and seminar will involve programming in R to visualize and analyze ecological data. In the lab, students will have both individual and team assignments to provide practice coding in R, one of the main languages used today in performing statistical analysis. Comfort with R will be helpful in learning other languages in the future in a statistical context. Off-the-shelf software, while more convenient, may not be available in the work environment you find yourself in and certain tests you may need may not be available in any such software. Thus, learning to code is the best path forward for future practitioners of ecological science.

Learning Objectives

At the end of the course, you will:

- Understand the scope of ecology and its place in the natural sciences
- Be able to define the levels of ecological organization, such as population, community, ecosystem, and landscape.
- Demonstrate a broad understanding of the processes that shape the distribution and abundance of organisms from the micro-habitat to the global scale.
- Analyze interactions within the context of specific habitats and judge how the habitat shapes the distribution and abundance of species.
- Demonstrate understanding of key factors that influence the habitat include climate, energy input, spatial/temporal complexity, and resource availability.
- Apply concepts of biological evolution to all course topics.
- Recognize that the distribution of organisms is a product of positive and negative interactions within and across trophic levels, including competition, mutualism, predation, and parasitism.
- Interpret how organism function, habitat context and interactions within and across trophic levels influence the flow of energy and the movement and recycling of matter in communities and ecosystems.
- Evaluate how ecological processes across all scales are affected by human activities, and apply basic ecological principles to meet societal resource management and conservation goals.
- Be able to distinguish among allied scientific disciplines (environmental science, conservation biology, restoration ecology, and environmental engineering) and compare their purposes with that of ecology.
- Gain experience developing ecological hypotheses and designing observational and experimental studies in field and laboratory settings.
- Gain experience with modeling, data collection techniques, and statistical analysis used to test ecological hypotheses.
- Synthesize information from the primary scientific literature; logically interpret the results of original research in the context of established ecological knowledge.
- Be able to analyze, interpret, and communicate data gathered from ecological research in the field using R and RStudio.
- Practice written and oral communication skills necessary to communicate research findings and interpretations to policy makers, scientists, stake holders and the general public.

Website: <https://brightspace.usc.edu/d2l/home>

Brightspace will be your home base for this course! Please check frequently for announcements and course materials including lecture notes, additional/supplemental readings, lab assignments, lab discussion board, and grades.

Required Texts

Lecture: [Ecology 6th Edition by Bowman and Hacker](#)

Laboratory: Laboratory material will be posted as PDF files on Blackboard

Evaluation Criteria and Grading

Assessment	Points	% of Grade
Lecture		
Midterm I (Sep 23)	142.5	19%
Midterm II (Oct 21)	142.5	19%
Final Exam (cumulative - weighted) TBA	150	20%
Laboratory		
Lab Discussions	15	2%
Lab assignments	300	40%
TOTAL	750	100%

Tentative Lecture Schedule

Date	Lecture Topic	Lecture Readings
26-Aug	Introduction to Course & Ecology	Syllabus, Ch 1
28-Aug	The Physical Environment	Ch 2
02-Sep	No class - Labour Day Holiday	
04-Sep	Biomes and California Ecoregions	Ch 3
09-Sep	Adaptations to Environmental Variation	Ch 4/5
11-Sep	Evolution, Selection, and Speciation	Ch 6
16-Sep	Life History and Reproductive Strategies	Ch 7
18-Sep	Behavioural Ecology	Ch 8
23-Sep	Midterm 1	
25-Sep	Population Distributions	Ch 9
30-Sep	Population Dynamics	Ch 10
02-Oct	Population Growth and Regulation	Ch 11
07-Oct	Predation (including herbivory)	Ch 12
09-Oct	Eliza Guest Lecture on Research	
14-Oct	Symbioses	Ch 13/15
16-Oct	Competition and Facilitation	Ch 14
21-Oct	Midterm 2	
23-Oct	Ecological Communities	Ch 16
28-Oct	Change in Communities	Ch 17
30-Oct	Community Diversity	Ch 19
04-Nov	Ecosystem Ecology - Productivity and Trophic Levels	Ch 20
06-Nov	Ecosystem Ecology - Energy Flow and Food Webs	Ch 21
11-Nov	No class - Veteran Day Holiday	
13-Nov	Ecosystem Ecology - Nutrient Supply and Cycling	Ch 22
18-Nov	Biogeography and Landscape Ecology	Ch 25
20-Nov	Global Ecology	Ch 23
25-Nov	Applied Ecology	Ch 23
27-Nov	No class - Thanksgiving Holiday	
02-Dec	Urban Ecology	Miguel Ordeñana (NHM)
04-Dec	Careers in Ecology – Class Activity	

Tentative Laboratory Schedule

Following is a tentative schedule of lab activities. As with the lecture, they may subject to modification dependent on time and learning needs.

Date	Lab Topic	Pre-lab Reading	Lab Deliverables
26-Aug	No lab - First week of classes		
02-Sep	No lab - Labour Day		
09-Sep	Introduction to experimental design and presenting lab results and discussion board and Plant Productivity Experiment Setup	Tilman et al. (2001) Diversity and productivity in a long-term grassland experiment	
16-Sep	R Crash Course	Video on downloading/installing R and R studio + setting up working directory	Pre-Lab Assignment: Set-up working directory (1%) Post-Lab Assignment: Graphing and Statistical Analysis (4%)
23-Sep	Mammal foraging behaviour experiment setup and initial data collection	Jones et al. (2001) Coexistence of temporally partitioned spiny mice	Develop class line of inquiry and experimental design, and initial data collection
30-Sep	Mammal foraging behaviour experiment part II (data collection, sharing, and analysis)		Post-Lab Assignment: Visualization, analysis, and interpretation (5%)
07-Oct	NHM and Ornithology Lab	Material posted to Brightspace	Lab Assignment (5%)
14-Oct	Modelling Populations	Florida scrub lizard video (Brightspace):	Lab Assignment: Anolis population growth and regulation (5%)
21-Oct	Co-evolution of Plant-Pollinator Systems Part 1	Garbuzov and Ratnieks (2014) Quantifying variation among garden plants in attractiveness to bees and other flower-visiting insects	Design experiment and collect data in lab
28-Oct	Co-evolution of Plant-Pollinator Systems Part 2		Poster Presentations (5%)
04-Nov	Insect Diversity	Adams et al. (2020) Local- and landscape-scale variables shape insect diversity in an urban biodiversity hot spot	Lab Assignment: Community Diversity (5%)
11-Nov	No lab - Veteran Day Holiday		
18-Nov	Plant Productivity Harvest and Analysis		Lab Assignment: Biodiversity and Ecosystem Function (5%)
25-Nov	Urban Campus Restoration Part 1	LA Times Article: What are the 7 most important native plants in L.A.? (https://www.latimes.com/lifestyle/story/2021-05-17/la-most-important-native-plants-in-los-angeles) Klaus and Kiehl (2021) A conceptual framework for urban ecological restoration and rehabilitation	
02-Dec	Urban Campus Restoration Part 2		Group Presentation: Restoration Plan Proposal (5%)

Course Specific Policies

Communication – I am here to support you in your learning and want you to be in contact with me as much as possible. The best way to reach me is by email. Please be sure to include the course number in the subject line (**BISC315**). I do my best to respond to emails within 24hr (during the week) and on Monday if your email is sent over the weekend. If it has been more than 24hrs please send me a gentle reminder. Also please remember there are a lot of you and only one of me!

Policy on Missed Lecture Exams – No make-up lecture exams will be given in this course. You may be excused from an exam in the event of a documented illness, emergency, or other serious problem beyond your control. No other excuses for missing exams will be accepted. If you miss an exam for a legitimate reason, and wish to ask for accommodation, please contact me within 24 hours of the missed exam, send an email to me requesting that you be excused.

In the case of illness, this request must include either an official letter from your doctor stating that you were too sick to take the exam, or your doctor's name and contact information with permission for us to contact the doctor for a limited discussion of your condition. Note that neither you nor the doctor need tell us the nature of your illness.

If you miss an exam for non-illness related reasons, you must provide similarly convincing documentation of the emergency to the Lab Manager within a week. If we judge your excuse to be valid, we will give you a grade for the missed exam equal to the average of your grades for the equivalent exams that you did take. Except in extraordinary circumstances, we will make accommodations for only one missed lecture exam. If your excuse is judged not to be valid, or you do not provide it within the allotted time, you will receive a score of zero for the missed exam.

If you miss the final exam and have provided a valid medical excuse to the Lab Manager within 48 hours of the exam time, a final course grade of Incomplete (IN) will be recorded and you will be permitted to take a make-up final exam during the following semester.

Extra Credit – **No extra credit will be given** for special projects, etc.

Impairments Affecting Your Performance – Students occasionally encounter difficulties that affect their academic performance, such as illness, accidents, bereavement, depression, anxiety, learning disabilities, and other problems. If you encounter such difficulties, please bring them to the attention of one of the instructors. We can refer you to resources and may be able to offer accommodation. All such discussions will be confidential. Please seek help as soon as you feel your performance is being affected.

Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Course Evaluations

Course Evaluations will be conducted towards the end of the semester and will appear in the 'Course Evaluations' tab on the Blackboard. It is an important review of your experience in the class with the intent being for you to provide feedback on my teaching practice. Please take the time to complete these evaluations as I use these to help improve/strengthen my teaching. I welcome all constructive feedback!

Statement on Academic Conduct and Support Systems

Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, compromises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. [The Office of Student Accessibility Services](#) (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has

completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

[Learning Support & Resources](#) - You are part of a learning community made up of faculty, staff, and fellow students. Follow the link to find resources to help support your academic growth and success!

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323) 442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.