



## **BISC315L: Introduction to Ecology**

**4 units**

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

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

**Instructor: Cameron Egan, Ph.D.**

**Office: AHF 141**

**Office Hours: Wednesday, Thursday 12:00-1:00 (or by appointment)**

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

**Contact Info: [camegan@usc.edu](mailto: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 3:30-6:20**

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

**Lab Teaching Assistant: Teagan Baiotto**

**Contact Info: [baiotto@usc.edu](mailto:baiotto@usc.edu)**

**Office: TBA**

**Office Hours: TBA**

### **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. With the exception of one 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 mechanisms responsible for local small-scale, large-scale, and regional differences in climate and abiotic conditions.
- Understand how abiotic conditions influence the abundance and distribution of individuals, populations, and communities.
- Understand the role of physiological, behavioral, and physical adaptations in determining the fitness and distribution of species.
- Understand the basic mechanisms controlling population growth and be able to apply basic growth models to estimate future population size.
- Understand the concept of ecological communities and understand the types of interactions that exist within communities (competition, facilitation, mutualism, parasitism, commensalism, predation).
- Be able to apply ecological concepts towards applied aspects of ecology including conservation biology, ecological restoration, and management of urban ecosystems.
- Understand the principles of ecological field sampling and conduct field research using a variety of sampling techniques.
- Be able to analyze, interpret, and communicate data gathered from ecological research in the field using R and RStudio.

**Website:** <https://blackboard.usc.edu/>

Blackboard 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 6<sup>th</sup> 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 18)                     | 112.5      | 15%         |
| Midterm II (Oct 16)                    | 112.5      | 15%         |
| Midterm III (Nov 13)                   | 112.5      | 15%         |
| Final Exam (cumulative - weighted) TBA | 112.5      | 15%         |
| Laboratory                             |            |             |
| Lab assignments                        | 225        | 30%         |
| Discussion Board                       | 45         | 6%          |
| Data Contribution                      | 30         | 4%          |
| <b>TOTAL</b>                           | <b>750</b> | <b>100%</b> |

**Tentative Lecture Schedule**

Following is a tentative schedule of topics for the term which may subject to modification dependent on time and learning needs.

| <b>Date</b> | <b>Class Topic</b>  | <b>Readings</b>                            | <b>Deliverables</b> |
|-------------|---|--|---------------------|
| 21-Aug      | Introduction to Course & Ecology as a science                       | Syllabus, Ch 1                             |                     |
| 23-Aug      | The Physical Environment  | Ch 2                                       |                     |
| 28-Aug      | Biomes and California Ecoregions                                    | Ch 3                                       |                     |
| 30-Aug      | Coping with Environmental Variation                                 | Ch 4                                       |                     |
| 04-Sep      | <b>Labor Day - No Class</b>   |  |                     |
| 06-Sep      | Evolution, Selection, and Speciation                                | Ch 6                                       |                     |
| 11-Sep      | Life History and Reproductive Strategies                            | Ch 7                                       |                     |
| 13-Sep      | Behavioral Ecology  | Ch 8                                       |                     |
| 18-Sep      | <b>Midterm I</b>  |  | <b>Midterm I</b>    |
| 20-Sep      | Population Distributions  | Ch 9                                       |                     |
| 25-Sep      | Population Dynamics   | Ch 10                                      |                     |
| 27-Sep      | Population Growth and Regulation                                    | Ch 11                                      |                     |
| 02-Oct      | Predation (including herbivory)                                     | Ch 12                                      |                     |
| 04-Oct      | Symbioses (from mutualism to parasitism)                            | Ch 13, Ch 15                               |                     |
| 09-Oct      | Symbioses (from mutualism to parasitism)                            | Ch 13, Ch 15                               |                     |
| 11-Oct      | Competition   | Ch 14                                      |                     |
| 16-Oct      | <b>Midterm II</b>   |  | <b>Midterm II</b>   |
| 18-Oct      | Ecological Communities  | Ch 16                                      |                     |
| 23-Oct      | Change in Communities   | Ch 17                                      |                     |
| 25-Oct      | Biogeography  | Ch 18                                      |                     |
| 30-Oct      | Community Diversity   | Ch 19                                      |                     |
| 01-Nov      | Ecosystems - Productivity and Trophic                               | Ch 20                                      |                     |
| 06-Nov      | Ecosystems - Flow of Energy and Nutrients                           | Ch 21/22                                   |                     |
| 08-Nov      | Landscape Ecology   | Ch 24                                      |                     |
| 13-Nov      | <b>Midterm III</b>  |  | <b>Midterm III</b>  |
| 15-Nov      | Global Change - Climate change, habitat loss, and species invasions | Ch 25                                      |                     |
| 20-Nov      | Conservation Biology  | Ch 23                                      |                     |
| 22-Nov      | <b>Thanksgiving Holiday</b>   |  |                     |
| 27-Nov      | Urban Ecology   | Supplemental Reading<br>(check Blackboard) |                     |
| 29-Nov      | Restoration Ecology   | Supplemental Reading<br>(check Blackboard) |                     |

**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.

| <b>Date</b> | <b>Lab Topic</b>   | <b>Pre-lab reading (available on Blackboard)</b>  | <b>Deliverables</b>   |
|-------------|--|---|---|
| 21-Aug      | <b>No lab first week of class</b>  |   |   |
| 28-Aug      | Introduction and lab logistics and safety; Introduction to experimental design and presenting lab results and discussion board | <ul style="list-style-type: none"> <li>Proper display of data and statistics.</li> <li>Plant diversity experiment lab</li> </ul>  | Set up plant diversity experiment which will be harvested later in term.  |
| 04-Sep      | <b>No lab - Labor Day</b>  |   |   |
| 11-Sep      | R Crash course: Visualizing and Analyzing Ecological Data  | <ul style="list-style-type: none"> <li>Video on downloading/installing R and setting up working directory</li> </ul>  | <b>Assignment: Pre-lab set-up working directory (2.5%)</b><br><b>Assignment: Graphing and statistical analysis exercise (2.5%)</b>    |
| 18-Sep      | Mammal foraging behaviour experiment setup and data collection   | <ul style="list-style-type: none"> <li>Jones et al. (2001) Coexistence of temporally partitioned spiny mice</li> </ul>  | <b>Data contribution (1%)</b>   |
| 25-Sep      | Mammal foraging behaviour data sharing and analysis  |   | <b>Assignment: Mammal Foraging Behaviour (5%)</b><br><b>Discussion Board Contribution (1.2%)</b>                                      |
| 02-Oct      | Anolis Lizard Population Viability   | <ul style="list-style-type: none"> <li>Florida scrub lizard video</li> </ul>  | <b>Assignment: Anolis population growth and regulation (5%)</b><br><b>Discussion Board Contribution (1.2%)</b>                        |
| 09-Oct      | <b>No lab - Fall Recess</b>  |   |   |
| 16-Oct      | Plant diversity harvest and analysis   | <ul style="list-style-type: none"> <li>Tilman et al. (2001) Diversity and productivity in a long-term grassland experiment</li> </ul>   | <b>Assignment: Biodiversity and Ecosystem Functioning (5%)</b><br><b>Data contribution (1%) ;Discussion Board Contribution (1.2%)</b> |
| 23-Oct      | Ecosystem decomposition data collection  |   | <b>Data contribution (1%)</b>   |
| 30-Oct      | Ecosystem decomposition data sharing and analysis  | <ul style="list-style-type: none"> <li>Kotze &amp; Setälä (2021) Urbanisation differently affects decomposition rate of recalcitrant woody material and labile leaf litter</li> </ul> | <b>Assignment: Ecosystem decomposition (5%)</b><br><b>Discussion Board Contribution (1.2%)</b>  |
| 06-Nov      | Insect diversity data collection   |   | <b>Data contribution (1%)</b>   |
| 13-Nov      | Insect diversity data sharing, analysis, and discussion  | <ul style="list-style-type: none"> <li>Adams et al. (2020) Local- and landscape-scale variables shape insect diversity in an urban biodiversity hot spot</li> </ul>                   | <b>Assignment: Community diversity (5%)</b><br><b>Discussion Board Contribution (1.2%)</b>  |
| 20-Nov      | Conservation Biology Paper Discussion  | <ul style="list-style-type: none"> <li>Benson et al. (2020) Survival and competing mortality risks of mountain lions in a major metropolitan area</li> </ul>                          |   |
| 27-Nov      | <b>No lab final week of classes</b>  |   |   |

### 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, you should proceed as follows. Within 48 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](https://osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto: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](mailto: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.