

BIO SCI E190 – POPULATION & COMMUNITY ECOLOGY LAB – FALL 2017

Time: Tuesday & Thursday 9:30-10:50

Room: AIRB 1030

Instructors & Office Hours:

Professor Cascade Sorte, csorte@uci.edu, Steinhaus 359, OH Tues 11 am-noon in SH 359

Teaching Assistant Piper Wallingford, piper.wallingford@uci.edu, OH Wed 9-10 am in SH 387

Course Content: Predicting population growth rates and conserving biodiversity are two critical roles for ecologists in the current age of the Anthropocene. This course covers processes specific to groups of individuals of single species (populations) and multiple species (communities). Topics include growth, regulation, dynamics, and persistence of populations, and community interactions, development, diversity, and biogeographical patterns. We will also discuss the management and policy importance of population prediction and community indices.

Learning Goals: By the end of this course, you will have developed:

1. a foundational understanding of vocabulary, theory, and methodology in population and community ecology,
2. your abilities in interpreting and evaluating the results and presentation of ecological data,
3. skills in field survey methods and data manipulation and analysis,
4. increased effectiveness in communicating scientific information via writing and oral presentation, and
5. greater breadth and depth of scientific intuition.

Course Format: This course combines concept lectures, working group and paper discussions, and dry lab, computer lab, and field survey activities. This format recognizes that the most effective learning strategies differ between students, course content, and learning goals. Students should come to class having done any required reading or preparation. Classes will typically begin with a (ungraded) quiz and end with a 5-10 min re-cap of key concepts, progress towards learning goals, and remaining unanswered questions.

Readings: Required PDF readings and writing resources will be posted on the course Canvas site.

Suggested: “Ecology” by Cain, Bowman, and Hacker *and* “A Primer of Ecology” by Gotelli (*on reserve in library*)

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|----------------------------------|----|--------------------------|
| Grading (out of 100 pts): | 30 | Participation |
| | 20 | Quizzes (10 pts each) |
| | 10 | Leading Paper Discussion |
| | 40 | Project |

Grading Scale: A+ = 97+, A = 93-96, A- = 90-92, B+ = 87-89, B = 83-86, B- = 80-82, C+ = 77-79, C = 73-76, C- = 70-72, D+ = 67-69, D = 60-66, F <60. *Grades round up, so that 92.5 = A.*

Participation: Class attendance is required and included in your grade as participation. To receive full credit, you will need to come to class on time and well prepared (having done any required reading or assignment), actively participate throughout the discussion/activity, and follow any instructions specific to the activity. Up to 2 absences (*not* including field trips) are allowed without affecting your grade (i.e. the lowest 2 participation grades will be dropped). Save at least one for sickness as > 2 absences will require extensive documentation and make-up work.

Field surveys: Fieldwork is an integral part of the course and counts towards both participation credit and the project grade. Students will contribute to the project data set by attending one of 3 surveys at nearby coastal sites.
Shaw’s Cove in Laguna Beach – Wednesday, October 18, 2-4 pm (low tide at 15:20 and height of 0.09 m)
Rockpile Beach in Laguna Beach – Thursday, October 19, 2:30-4:30 pm (15:55, 0.04 m)
Little Corona in Newport Beach – Sunday, October 22, 3-5 pm (17:44, 0.10 m)

We will also conduct field surveys at the UC Preserve adjacent to campus on the last day of class.

Quizzes: Two 40-min. quizzes will be given, one at the end of each (Population and Community) unit. Quizzes are designed to test comprehension of concepts covered in lecture, discussions, and labs and will be free-response (i.e. no multiple choice). Practice questions will be incorporated into the course to help you prepare for the first quiz.

Leading Paper Discussion: Groups of four students will sign up to lead paper discussions that complement the day's topic. So that we stay on the "cutting edge", papers must have been published in 2015 or later in one of these ecology journals: *Ecology*, *Ecology Letters*, *Oikos*, and *Oecologia*. Discussion leaders are responsible for:
 >1 weeks before the discussion period: (1) email pdf of *two options* for your discussion paper to Prof. Sorte, and (2) schedule ½ hour meeting with Prof. Sorte to discuss the paper and your plan for leading discussion
 Day of discussion: come prepared to lead and engage your fellow students for a 30-40 min period. This should include presentation, discussion questions, small group work, games, etc. with leaders talking < 50% of the time.

Project: Your final project will be an opportunity to show your development in the course "learning goals" as you use actual ecological data (either the data set provided to you or data collected on your own) to evaluate research questions and hypotheses related to population and community ecology. The project will have the following steps:
 Oct. 19 – Receive project dataset & start brainstorming research questions
 Oct. 31 – Project proposal due by 5 pm (5 pts)
 Nov. 21 – Rough draft of paper due by 5 pm (10 pts), receive peer paper to review by 11/22
 Nov. 30 – Peer review due (bring 2 printed copies to class) & discussed during class (5 pts)
 Dec. 14 – Final poster presentation (during final exam period) (10 pts)
 Dec. 15 – Final draft of paper due by 5 pm (10 pts)
 Further details, instructions, and grading rubrics will be provided in class and on Canvas.

Schedule (*subject to change*)

| Class | Day | Date | Topic | Activity | Ch's* | |
|-------|-----|-------|--|--|------------|--|
| 1 | TH | 9/28 | Introduction to Populations | Population survey methods | 7,8 | |
| 2 | TU | 10/3 | Scientific Writing & Publication | Scientific paper working groups | | |
| 3 | TH | 10/5 | Life History | Paper discussion (Prof. Sorte & TA Wallingford) | 7,9 / 3 | |
| 4 | TU | 10/10 | Life History & Population Growth | Excel refresher & life tables in Excel | 9 / 1,2 | |
| 5 | TH | 10/12 | Population Growth | Population growth curves in Excel | 9 / 1,2 | |
| 6 | TU | 10/17 | Populations Dynamics | Paper discussion (Group 1) | 8,10 / 1,2 | |
| 7 | TH | 10/19 | Introduction to Project Data Set | Project working groups | | |
| 8 | TU | 10/24 | Population Persistence & Metapopulations | Paper discussion (Group 2) | 10 / 4 | |
| 9 | TH | 10/26 | QUIZ 1 (Population Ecology) | Statistics refresher in Excel | | |
| 10 | TU | 10/31 | Community Interactions: Competition | Interaction models in Excel **Proposal due by 5 pm | 11 / 5 | |
| 11 | TH | 11/2 | Community Interactions: Predation | Paper discussion (Group 3) | 12 / 6 | |
| 12 | TU | 11/7 | Community Interactions: Facilitation | Paper discussion (Group 4) | 14 | |
| 13 | TH | 11/9 | Community Interaction Webs | Data interpretation working groups | 15 | |
| 14 | TU | 11/14 | Community Diversity | Paper discussion (Group 5) | 18 | |
| 15 | TH | 11/16 | <i>No Class - Replaces time for intertidal field surveys</i> | | | |
| 16 | TU | 11/21 | Introduction to R Statistical Software | **Rough Draft due by 5 pm | | |
| | TH | 11/23 | <i>NO CLASS - HOLIDAY</i> | | | |
| | | | <i>HAPPY THANKSGIVING!</i> | | | |
| 17 | TU | 11/28 | Community Development | Paper discussion (Group 6) | 16 | |
| 18 | TH | 11/30 | Biogeography & Macroecology | Peer review discussions; **Reviews due in class | 17 | |
| 19 | TU | 12/5 | QUIZ 2 (Community Ecology) | Science in the media | | |
| 20 | TH | 12/7 | Conservation Applications | Field trip on campus & discussion | | |
| FINAL | | 12/14 | 8:00-10:00 FINAL POSTER SESSION | **Final Paper Due by 5 pm on Fri 12/15 | | |

* Chapters in suggested, optional texts given as: Cain, Bowman & Hacker / Gotelli
 Required reading assignments will be announced and distributed in class and/or on Canvas.

Please Note: Students are responsible for adhering to UCI policies on class attendance (beyond the participation policies listed above), requesting disability services, and academic honesty (all cases of suspected plagiarism will be referred to the Office of Academic Integrity, and all plagiarized assignments will be given a 0 grade).