Advanced Topics in Ecology & Evolution

QSB/ES 248

Fall Semester 2021

- **Lecture Time**: Tuesday and Thursday, 9:00 - 10:15AM
- **Lecture Location**: CLSSRM 266 and Zoom
- **Instructor**: Justin D. Yeakel; Office Hours: TBD
- **Course Websites**
  Everything that we do this this course will revolve around this website, where you will find: *Basic course information, schedule, links to readings.* Assignments will be turned in via *Canvas*. All written assignments must be in PDF format.
- **Course Schedule**: [Course Schedule]({{ site.url }}/teaching/advtopicsecoevo/schedule)
- **Course Description**
  - This course utilizes directed readings and discussion of classical and current literature in ecology and evolutionary biology, focusing on literature that emphasizes systems concepts of population variation and linkages across scales from genes to ecosystems. Students are expected to have completed college-level, introductory courses in ecology and/or evolution before taking this course. In Fall 2019, the class will rely on a combination of a chapters from the book ***Evolutionary Ecology: concepts and case studies*** by Fox, Roff, and Fairbairn, and the primary literature. The field of Evolutionary Ecology provides an organizing way to introduce key concepts in both Ecology and Evolution, integrating topics from evolution and ecology and spanning scales from genes to ecosystems. We will, for all topics, emphasize concepts from a systems perspective. This means that we will explicitly discuss, for each topic:
    * Whether the (and which) conclusions depend on the empirical/ experimental/ observational/ computational investigation of biological systems across multiple scales of organization.
    * The ways in which data related to the topic capture emergent properties of populations and networks.

- **Format & Procedures**

  - Each class period, we will discuss either a book chapter or a peer-reviewed paper. Students should have read the papers thoroughly before each class. One student will be in charge of leading the discussion of the papers for each class period, and that individual will need to have a strong enough understanding of the paper(s) to facilitate a lively discussion among the class participants. Discussion

leads are encouraged to meet with the instructor to discuss the readings prior to their assigned day. Each student will be required to facilitate two class period alone and one class period with a co-lead. There will be additional out-of-class work focused on writing syntheses over the course of the semester.

- **Elements of the Course**
  - ***Engagement:*** There are 29 class discussion periods, excluding the 'Week 1' organizational class. You can miss three class periods without penalty (i.e., your three lowest grades will be dropped).
  - ***Question Submission:*** To help facilitate discussions, everyone will be required to submit 3 potential questions/topics for discussion. Questions will be entered on an associated docx file on Box. Make sure you are signed onto Box.com to edit.
    - The standards for the number of times per semester you need to submit discussion questions to achieve different grades in this category are the same as for the Engagement category (i.e., you need to submit questions 26 times over the course of the semester. Your three lowest scores (out of 29 discussion periods) will be dropped.
    - Note that Engagement and Question submission are decoupled. In other words, simply submitting questions does not constitute engagement and, conversely, you can demonstrate in-person engagement in a topic without having submitted questions.
  - ***Discussion Lead:*** Each person will be expected to lead discussion **two times** throughout the semester. To demonstrate your understanding of and preparation for discussion, **you will submit an outline that summarizes your preparation (i.e., addresses the first three bullet points below) prior to the start of the class**. Submission will be via *Canvas* You will be evaluated based on the following attributes.
    - Necessary background context and definitions
    - Explanation of key figures
    - Connection of the topic to Systems themes (see Course description) for the specific themes
    - Incorporation of student-submitted discussion questions
    - In-person discussion leadership
  - ***Syntheses:*** Everyone will submit **7 Syntheses** over the course of the semester (see schedule). Syntheses will cover a particular topic of set of topics, and will consist of a series of carefully worded statements that articulate your understanding of concepts from course readings and papers that you must find yourself. See [here]({{ site.url }}/teaching/advtopicsecoevo/syntheses){:target="_blank"} for an explanation and set of examples of syntheses. Syntheses will be submitted via *Canvas*.

- **Grading**
  - Engagement: 10% total
  - Question submission: 20% total
  - Discussion leads: 3x @ 7% each; 21% total
  - Syntheses: 7x @ 7% each; 49% total
- ***Course Policies***
  - All assignments must be submitted by the posted date and time for full credit. For every day late that an assignment is submitted, the final grade is reduced by 10% of the original points. Assignments turned in up to 1/2 a day late (including all submissions received after the deadline in CatCourses, even a few minutes after the CatCourses deadline) will be marked down by 5%. Note that excuses such as "CatCourses was lagging so it was marked late" are not valid (unless there is a major, system-wide outage).
  - In general,there is built-in flexibility for most elements of the course such that students can drop their lowest grade(s) (eg for engagement and discussion questions). For all other components of the grade, late assignments will be accepted, subject to the point reductions outlines above. Thus, generally no extra-credit or make-up assignments will be given.
  - If you anticipate missing class due to prior obligations (i.e. conference travel, unusual TA obligations, etc) that may mean the build-in flexibility outlined above is not sufficient, please discuss early in the semester with Prof. Yeakel. If you experience any health or other emergency circumstances, please talk with Prof. Yeakel as soon as possible.
  - University's policies concerning academic honesty will be strictly enforced.
- **Course Goals & Outcomes**
  - Course Goals:
    - Critically read and discuss both classical ecological and evolutionary studies and contemporary hot topics in ecology and evolution
    - Develop an appreciation of how classical ecological and evolutionary studies have influenced current thinking in ecology and evolutionary biology, and how much of ecological and evolutionary research exemplifies systems perspectives.
    - Comprehend how paradigm shifts in ecology and evolution occur, and whether there are common features that can be applied to the design and analysis of future studies.
    - Develop the skills for writing a publication-quality review on an ecological or evolutionary topic in need of synthesis.
    - Improve oral communication skills when discussing scientific concepts.

- Course Learning Outcomes: The Course Learning Outcomes (CLOs) support student development of the Graduate Group Program Learning Outcomes (PLOs). The connections between the CLOs are made explicit through the indication of which PLOs are connected to each CLO below. By the end of the course, students will be able to:
  * Name the researcher(s), cite the publication, and explain the general objectives/hypotheses and conclusions in several classical and contemporary papers in ecology and evolution. Clearly articulate the contributions of these studies to the advancement of the fields of ecology and/or evolution. (ES PLOs 1; QSB PLOs 1,3)
  * Discuss in depth how aspects of both ecology and evolution exemplify systems thinking, including principles of population variation and interactions within and among levels of the biological hierarchy. (ES PLOs 1; QSB PLOs 1)
  * Identify a topic in need of synthesis in ecology and/or evolution, conduct a thorough literature search, synthesize the information, and write a publication-quality manuscript on a topic of interest. (ES PLOs 1,2; QSB PLOs 1,4,5)
  * Communicate orally about complex ecological and evolutionary information with clarity of thought, and be able to support and defend positions on concepts, methods, interpretations, and inferences made in ecological and evolutionary studies. (ES PLOs 2; QSB PLOs 3,4)
- Program Learning Outcomes. This course connects to the ES learning outcomes by:
  * PLO 1: Core Knowledge - Graduates will be knowledgeable, skillful and self-directed in the observation and analysis of environmental systems in terms of their capacity to independently identify important research questions, develop experimental plans, analyze data, and formulate conclusions in the context of a doctoral dissertation.
  * PLO 2: Communication Skills - Graduates will be conversant in at least two areas of environmental systems, and be adept at oral, written and visual communication of research results to peers and non-technical decision makers
- Program Learning Outcomes. This course connects to the QSB learning outcomes by:
  * PLO 1, Demonstrate quantitative and systems biology skills (CLOs 1,2,3)
  * PLO 3, Demonstrate effective classroom teaching and communication of scientific concepts (CLOs 1,4)
  * PLO 4, Demonstrate ability to perform original scholarship in specialized areas of biology (CLOs 3,4)
  * PLO 5, Ability to perform original research that advances scientific knowledge (CLOs 3)

- **Academic Integrity**: Academic integrity is the foundation of an academic community and without it none of the educational or research goals of the university can be achieved. All members of the university community are responsible for its academic integrity. Existing policies forbid cheating on examinations, plagiarism and other forms of academic dishonesty.
  - Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy
  - Any work submitted by a student in this course for academic credit will be the student's own work.
  - You are encouraged to study together (virtually) and to discuss information and concepts covered in lecture and the sections with other students (virtually). You can give "consulting" help to or receive "consulting" help from such students (virtually). However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e mail, an e mail attachment file, a diskette, or a hard copy. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Policy can also be extended to include failure of the course and University disciplinary action.
  - During examinations, you must do your own work. Communication in any form is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.
  - Examples of academic dishonesty include:
    * receiving or providing unauthorized assistance on examinations
    * using unauthorized materials during an examination
    * plagiarism - using materials from sources without citations
    * altering an exam and submitting it for re-grading
    * fabricating data or references
    * using false excuses to obtain extensions of time or to skip course-work
  - The ultimate success of a code of academic conduct depends largely on the degree to which the students fulfill their responsibilities towards academic integrity. These responsibilities include:
    * Be honest at all times.
    * Act fairly toward others. For example, do not disrupt or seek an unfair advantage over others by cheating, or by communicating during exams.
    * Take group as well as individual responsibility for honorable behavior. Collectively, as well as individually, make every effort

to prevent and avoid academic misconduct, and report acts of misconduct which you witness.

  - Do not submit the same work in more than one class. Unless otherwise specified by the instructor, all work submitted to fulfill course requirements must be work done by the student specifically for that course. This means that work submitted for one course cannot be used to satisfy requirements of another course unless the student obtains permission from the instructor.
  - Unless permitted by the instructor, do not work with others on graded coursework, including on exams or on homework assignments. When an instructor specifically informs students that they may collaborate on work required for a course, the extent of the collaboration must not exceed the limits set by the instructor.
  - Know what plagiarism is and take steps to avoid it. When using the words or ideas of another, even if paraphrased in your own words, you must cite your source. Students who are confused about whether a particular act constitutes plagiarism should consult the instructor who gave the assignment.
  - Know the rules --- ignorance is no defense. Those who violate campus rules regarding academic misconduct are subject to disciplinary sanctions, including suspension and dismissal.

- **Accommodations for Students with Disabilities**

  The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.

  The instructor will make every effort to accommodate all students who, because of religious obligations, have conflicts with scheduled exams, assignments, or required attendance. Please speak with the instructor during the first week of class regarding any potential academic adjustments or accommodations that may arise due to religious beliefs during this term.