

Functional and ecophysiological approaches to population and community ecology

EEB 297, Spring 2016

Tentative meeting time: Tu 2-4 PM, Life Sciences 3215

Instructor: Nathan Kraft (nkraft@ucla.edu)

<https://sites.lifesci.ucla.edu/eeb-kraft/eeb-297-spring-2016/>

Course rationale:

Since the very beginnings of the field of ecology there has been an appreciation that the functional or ecophysiological variation among organisms in traits such as body size, leaf structure, metabolic rate or wing morphology can be a helpful tool for understanding the processes that structure populations and communities. This perspective has been reinvigorated in recent years by rapid growth in the subfield of functional trait-based ecology, which has promised to bring greater generality and also a stronger mechanistic basis to many areas of population and community ecology. The goal of this graduate seminar is explore the key foundations of this subfield, to survey the breadth of research questions that are currently being addressed through the use of functional traits, and finally to discuss the challenges and opportunities for innovation that exist on the current research landscape. In keeping with the breadth of the field, we will explore these questions from a broad taxonomic perspective, including work focused on both animals and plants.

Format:

This seminar will explore current topics in trait-based ecology through class discussions of readings and short lectures. A tentative schedule of topics is presented below, though in the meeting first participants will collectively revise this schedule to reflect the interests and background of the class. We will then explore each of these topics through discussions of the primary literature and short presentations.

Readings will be a mix of essential papers assigned to all participants (1-2 per week) as well as a larger group of papers reflecting the breadth of topics in the field that will be divided up to be read and discussed in small groups (1 per week per student), with reports back to the entire group. Each week, one student, the **lecturer**, will be responsible for providing a short (10-15 min) lecture on the background of the papers at the start of class. A second student will be the **discussion leader**, who will have chosen the assigned readings (in consultation with the lecturer and the instructor) and will facilitate the discussion of these readings.

Provisional schedule:***Part I: Foundations***

Week 1: Introduction to the scope of the subject and the seminar, discussion of course schedule, assigning topics.

Week 2: Conceptual basis of trait-based ecology

Week 3: Physiological basis of key plant functional traits

Week 4: Physiological basis of key animal functional traits

Part II: Current applications

Week 5: Demographic variation and population dynamics

Week 6: Species interactions

Week 7: Community pattern and dynamics

Week 8: Biogeographic patterns

Part III: Integration

Week 9: Limitations of the trait-based approach

Week 10: Synthesis and future directions

Learning objectives:

Students will gain:

- Knowledge in both fundamental and current research areas
- Exposure to a diversity of ecological research tools
- The ability to think critically across a range of scales of organization in both plant and animal systems
- Scientific communication skills

Grading:

33% Attendance and preparation

33% Active participation in discussions

20% Presentation as lecturer

13% Discussion facilitation as discussion leader

1% Course Evaluation