

Ecological Dynamics :: QSB/ES 256

When: Spring 2023
TR 12:00-1:15
COB2 266

Instructor: Justin Yeakel
jyeakel@ucmerced.edu
<http://jdyeakel.github.io/>



What is it?

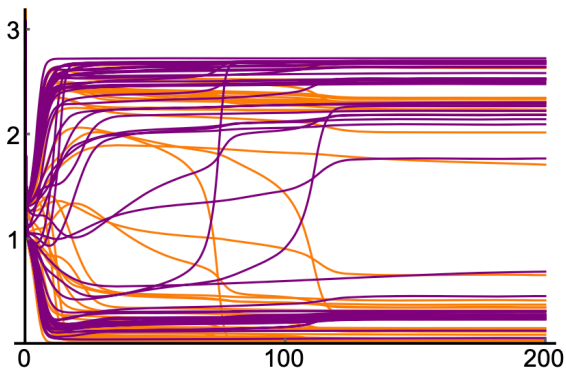
This course is designed to introduce graduate students to thinking about the mechanisms behind species interactions in ecological systems, and how to explore our assumptions with relatively small, relatable, ecological models.

We will learn about and explore models of species interactions across many different scales — from the individual, population, to community level — which will require us to think about the different processes and constraints that come into play within each.

We will begin by thinking about the processes shaping the dynamics of populations, investigate the concept of stability (what makes a population stable or unstable?) and what it means for extinction, and then integrate interactions among and between multiple species. As we continue to expand our scope, we learn how to deal with communities, where complex networks of species interactions must now be simplified in order for us to learn something from them. After tackling this complexity, we use our toolsets to zoom in again and explore the constraints and limitations that govern how individuals interact with the world around them.

What do you need to know?

The most important prerequisite for this course is to have questions and curiosity. If you have questions and curiosity, the gaps that remain will be filled in over time. The toolsets that we will use in the course are primarily composed of analysis, some introductory coding in R, and basic exploration using Mathematica (no prior familiarity with Mathematica is needed). Students will use some very basic tools from Calculus (taking simple derivatives) on occasion, but don't let that scare you away if it's been a while! If you are familiar with the R environment, that will be helpful, but I strive to introduce the material such that no prior experience is necessary. We are here to learn!



What will you get out of the course?

You will leave the course with a better understanding for how to conceptualize your scientific questions into simple models, grasp the limitations and potential power of those models, and be comfortable thinking in 'model space'. The course culminates with a self-directed research project, where you apply tools that we learn in the class to your own systems of interest. And who knows? Perhaps this will lead to a publication!