

BISC 510: THEORETICAL ECOLOGY (Spring 2020)

Meeting time: Tuesday, Thursday, 11:00 am - 12:15 pm

Location: Shoemaker Hall 225

Instructor: Dr. Peter Zee

Email: zee@olemiss.edu

Office: Shoemaker Hall 328

Office hours: By appointment.

Book: *A Primer of Ecology with R*, by M. Henry H. Stevens.

(Available as an eBook through the library). There will be other reading that will be distributed in class and/or on Blackboard.

Course objectives and learning outcomes:

The goal of this course is for students to explore the use of mathematical and computational programming tools to describe and analyze ecological patterns in nature. We will start by analyzing single species population models and build through models of interacting species. Readings from the book will be supplemented by readings from the primary literature. Over the course of the semester, students will gain skills and appreciation of:

1. Mathematical models of ecology
2. Programming in the R programming language
3. Experience reading and discussing theoretical primary literature

These outcomes will be assessed via homework problem sets and through class participation.

Attendance: Attendance at each lecture is required. Participation will be a part of your grade in the class.

Homework: Homework assignments will be assigned on the topics considered in the class. These will include both analytical calculations by hand and computer programming using the R programming language.

Participation and Discussion: All students are expected to actively participate in class through both paper discussions and programming sessions. All students will be responsible for leading the class discussion of one paper.

Grades: Grades will be based on homework assignments, class participation, and leading a paper discussion. Unless any assignment is explicitly stated to be working with others, assignments are meant to be completed alone.

A — 90-100%

B — 80-89%

C — 70-79%

D — 60-69%

F -- <60%

Electronic devices: Turn off and put away all cell phones and other devices during class. Taking notes by hand is highly recommended.

Disability Access and Inclusion: The University of Mississippi is committed to the creation of inclusive learning environments for all students. If there are aspects of the instruction or design of this course that result in barriers to your full inclusion and participation, or to accurate assessment of your achievement,

please contact the course instructor as soon as possible. Barriers may include, but are not necessarily limited to, timed exams and in-class assignments, difficulty with the acquisition of lecture content, inaccessible web content, and the use of non-captioned or non-transcribed video and audio files. If you are approved through SDS, you must log in to your Rebel Access portal at <https://sds.olemiss.edu> to request approved accommodations. If you are NOT approved through SDS, you must contact Student Disability Services at [662-915-7128](tel:662-915-7128) so the office can: 1. determine your eligibility for accommodations, 2. disseminate to your instructors a Faculty Notification Letter, 3. facilitate the removal of barriers, and 4. ensure you have equal access to the same opportunities for success that are available to all students.

TOPICS IN ORDER (topics will span multiple class sessions)

- 1 Introduction to course*
- 2 Getting started with R programming*
- 3 Density-independent population growth*
- 4 Matrix models and structured populations growth*
- 5 Density-dependent population growth*
- 6 Meta-population models*
- 7 Competition*
- 8 Predator-Prey*
- 9 Disease*

******Any changes to the syllabus will be announced in lecture and/or Blackboard******

Enjoy the semester!