Modeling Methods in Mathematical Biology
MAP 4484/5489, Spring 2014

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Office Hours (Little Hall 460)
Mon 2 - 4 pm
Tues 10:30 am - noon

Text

Mathematical Methods in Biology,
by J. David Logan and William R. Wolensky

Course Objectives

Mathematical models of biological systems. Topics include models of growth, predator-prey populations, competition, the chemostat, epidemics, excitable systems and analytical tools such as linearization, phase-plane analysis, Poincare-Bendixson theory, Lyapunov functions and bifurcation analysis.
Prerequisite: MAP 2302, and MAS 3114 or MAS 4105, both with minimum grades of C, or permission of the course instructor.

Course Material

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Chapter 1	Introduction to Ecological Modeling
Chapter 2	Population Dynamics for Single Species
Chapter 3	Structure and Interacting Populations
Chapter 4	Interactions in Continuous Time
Chapter 5	Concepts in Probability
Chapter 7*	Stochastic Processes

(Sections from the starred chapters will be covered if time allows.)

Evaluation. There will be two midterms, which will account for a total of 40% of your grade, one (take home) final exam which will account for 30% of your grade and several homework assignments, which account for the remaining 30%. The final grade is curved, and typically it works out close to this:

$$\text{A: } [85-100], \text{B: } [70-85], \text{C: } [60-70], \text{D: } [50-60], \text{E: } [<50]$$

Homework will be assigned for each section and can be found on the course website, but only a subset will be collected. You are responsible for the material in the homework problems, *and you will not succeed in this class if you do not engage with these exercises.*

Make-up Exams. Upon providing written documentation of a serious reason to miss an exam (e.g., a doctors note), make-up exams will be granted. Unless in the case of a medical emergency, requests to reschedule an exam must be made *in advance*.