

Math 007
Intro to Math Bio - Fall 2010

Class: Tuesdays and Thursdays, 9:55-11:10 AM, Science Center 104 or Trotter 201

Instructor: Professor Sarah Hews

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Course Description: The goal of this course is to be able to read and understand the mathematics found in scientific articles. To reach this goal, we will use computer labs and a range of in-class projects designed for you to become familiar with a range of mathematical modeling techniques (Boolean equations, difference equations, differential equations, agent based models, etc). You will not be learning the mathematical theory of these modeling techniques but rather how to read them, use them, and understand the implicit assumptions of each model. Think of it as a survey class. We will read several papers throughout the semester culminating with a paper of your choice as your final project. Equal time will be spent on population, organismal, and cell / molecular levels of organization.

Prerequisites: Bio 1 or Bio 2

Administrative Details: Tuesdays will consist of a lab or a project. The labs will be in Trotter 201 and the projects will be in SC 104. There will be lab reports, wiki entries, three articles to read throughout the semester, and a final project.

Wiki Entries: Throughout the semester, you will write and edit entries in the MathBio Wiki. Each entry will focus on a modeling technique that we have covered. More details will be handed out with the first assignment.

Lab Reports: In class, you will use computer labs and projects to become familiar with how mathematics is used in biology (or other fields). You will have a lab report that will be due the week following each project. More details will be handed out for each lab / project.

Papers: At the end of each level of organization, you will read an assigned paper. We will discuss in class and then there will be a short writing assignment. You are not expected to know all of the biology or mathematics in these papers but we will discuss what biological assumptions are made in the models and what these models tell us about the biology. This is the main skill that we are developing towards this semester, so expect the first one to be challenging and that you will feel more comfortable with these assignments throughout the semester. Several readings of the papers will be necessary. During these weeks, there will not be labs or projects.

Final Project: Before fall break, you will select a biological paper to use for your final project. You will present the paper in class after Thanksgiving and hand in an assignment that explains the impact of the mathematics on the last day of class. More details will be presented in class as the time approaches.

Grading: The final course grade will be determined by:

Participation:	5%
Wiki Entries:	10%
Lab Reports:	35%
Responses to Papers:	15%
Final Project:	35%