

Math Models in Biology	Dr. James Peirce , 1027 Cowley, 785-6604
Spring 2009, MTH 265, 4 Credits	Office Hours: MW 2:30-4:30 in 1027 Cowley
MTuWTh 1:10 - 2:05 in 045 Cowley Hall	email: peirce.jame AT uwlox DOT edu
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It is widely anticipated that Biology and Medicine will be the premier sciences of the 21st century. The complexities of the biological sciences make interdisciplinary involvement essential and the increasing use of mathematics in biology is inevitable as biology becomes more quantitative.

Course Description: An introduction to the use of calculus and stochastic based models to the biological sciences. Mathematical tools such as discrete and continuous differential equations, linear algebra, phase portraits, probability theory and descriptive and inferential statistics that are necessary to analyze and interpret biological models will be covered. Biological topics may include single species and interacting population dynamics, modeling infectious diseases, enzyme kinetics, and quantitative genetics.

Learning Objectives: Demonstrate an understanding of solving problems by recognizing the problem, reviewing information about the problem, developing plausible solutions, and evaluating the results.

Primary Text: *Mathematical Models in Biology*, by Allman and Rhodes. In addition we will be using my notes on 1) dynamic modeling with differential equations and 2) inferential statistics.

Due to the amount of material covered, it is very important that you keep up with the assigned reading and homework. To best prepare yourself for class, you should read ahead.

Homework: Suggested homework problems from the textbook will be assigned each class period and should be attempted by the NEXT CLASS PERIOD. Each Thursday a written homework problems will be assigned and collected.

Even though homework from the textbook will not be collected, a thoughtful completion of the homework problems is the most reliable path to success in this course. I strongly encouraged you to work together on homework.

Exams: There will be no makeup exams. In the event that you miss an exam due to circumstances beyond your control, the final exam will count for a larger part of your grade. The final exam will be comprehensive with an emphasis on material covered after the last exam.

EXAM DATES:

Exam 1	Feb. 12th	Exam 3	April 2nd	Final	Monday May 11th
Exam 2	March 5th	Exam 4	April 23rd		2:30 PM - 4:30 PM

Assessment Quizzes: A week before each exam there will be a 15 minute assessment quiz. The assessment quizzes will be a comprehensive quiz with problems similar to the exam.

Projects: I firmly believe that the act of writing mathematics can enhance your learning. The depth of understanding required to produce a lucid mathematical explanation is generally deeper than that demanded by traditional homework assignments. There will be at least two projects assigned.

Grading: Your final grade will be based on

weekly homework	20 points each; lowest dropped	180 points
4 assessment quizzes	10 points each	40 points
4 exams	100 points each	400 points
projects		60 points
comprehensive final		150 points
TOTAL	Maximum Possible	830 points

A	764-830
AB	730-763
B	681-729
BC	647-680
C	581-646
D	498-580
F	Below 498

Final cutoffs for these grades as well as cutoffs for AB and BC will be determined based on clustering of scores.

Extra Credit: There will be NO opportunity to earn extra credit. If you need a C or better in this class you should try to build a comfortable margin before taking the final exam.

AND Finally: If your cell phone rings, buzzes, or makes an audible sound during class you will bring in cookies to share with class at the next meeting.

Ways to succeed in this class:

Class Attendance: If you miss class due to circumstances beyond your control or if despite efforts you do not understand material covered in class, I am EAGER to provide additional help! If you can't meet during my office hours, feel free to contact me by phone or email to set up an appointment. On the other hand, if you choose to skip class or sleep through class you should not expect me to provide private tutoring on the material you missed.

Ask Questions: If you have questions on the homework you have been working on or on questions on the material covered in class, you can come to my office hours. If you cannot make these hours, just talk to me and we'll set up a time that works for both of us. You're welcome to stop by my office anytime and see if I'm free.

General Strategy: The following list of steps is the way in which I suggest you study for this course:

- Study in groups.
- Each night, read the section that is going to be covered the next class period.
- Look for relationships (similarities and differences) between a new section and the sections that came before (there are usually many).
- Work through (don't just read) the examples in text.
- Come to class the each day prepared to ask questions related to any concept or problem that you do not understand.
- After class, attempt to complete all of the problems that you were not able to complete the night before.
- Try to make sure that you cannot only successfully *complete* the problems, but that you also *understand* why the solution process works.
- Make a point how it is you will communicate your work. On exams and quizzes, it is necessary to "Show Me How" to find the solutions to each problem, not simply come up with the answer.
- Remember that there is quite a bit of help available. So if you cannot complete this list, get help (soon). Specifically, **make use of my office hours!**

Accommodation: Any student with a documented disability (e.g., physical, learning, psychiatric, vision, or hearing, etc.) who needs to arrange reasonable accommodations must contact the instructor and the Disability Resource Services Office (165 Murphy Library) at the beginning of the semester. Students who are currently using Disability Resource Services will have a copy of a contract that verifies they are qualified students with disabilities who have documentation on file in the Disability Resource Service Office.