

Calculus for biological sciences I – Math 246
Syllabus and guidelines 2009-2010
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Text: *Calculus for Biology and Medicine*, by Claudia Neuhauser, 2nd edition. We will cover roughly chapters 2, 3, 4 and 5.

Exams: There will be 2 midterms at the end of week 4, and at the end of week 8. There will be a two hour final exam at the time scheduled by the registrar's final exam calendar.

Quizzes: We will also have 3-4 quizzes (usually on Fridays).

Problem Sets: There will be (mostly) weekly homework assignments, Homework will usually be due on Wednesday. We will usually devote Tuesdays to problem solving.

Grades: Each hour exam will count as 20% of your grade, the total homework will count as 20% of your grade, the total quizzes will count as 10%, and the final exam will count for 30%.

It is extremely important to study the relevant part of the text *before* the related lecture. This will make lectures easier to understand and give you a chance to ask questions that come up reading the text.

Doing the homework seriously is the most important thing you can do to succeed in this course. Start early, and do some every day. I encourage you to work together on homework, as long as the work you do is really your own.

Please do ask questions about the homework, or any other aspect of the course in class. I will always be happy to spend the first few minutes of class dealing with homework questions, or questions from previous lectures, so come prepared! In order to ask questions effectively, make notes to yourself as you review lectures (and discover points that are unclear to you), as you study the text (and notice things that you are not sure you understand), and as you work on homework and come to problems you have trouble with.

Approximate Schedule

Week 1: Discrete population models and sequences. 2.1-2.2.

Week 2: Long time behavior and the idea of limits. 2.3.

Week 3: Limits of functions and continuity. 3.1-3.3.

Week 4: Calculation of limits. 3.4-3.5.

Week 5: Derivative. Differentiation rules. 4.1-4.3.

Week 6: Chain rule. Implicit differentiation. Trigonometric functions. 4.4-4.5.

Week 7: Inverse functions. Exponential function and logarithm. 4.6-4.8.

Week 8: Derivatives and graphs. 5.1-5.3.

Week 9: Optimization problems. L'Hospital's rule. 5.4-5.6.

Week 10: Review.

Course Goals

Main goal of this class is to understand the derivative both as the slope of the tangent and as a rate of change, and to learn how to compute it. The most important applications: optimization and curve sketching should be emphasized.

Potential Problems:

(1) Algebra background. A lot of the students in this course will have insufficient algebra background. Many of them can catch up, but they'll have a real slog, and will have to spend way more time on homework than the 8-9 hours per week that I expect from everyone. They have trouble with things like factoring polynomials and simplifying rational expressions. This makes it hard for them to do things like integration of rational functions. Many students will need to be reminded about trigonometric identities which used in differentiation of trigonometric expressions.