

Calculus for biological sciences I – Math 246

Syllabus and guidelines 2019

Instructor: Victor Ostrik; office Deady 10B,
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Class meets: MTWF 11:00-11:50am, Deady 301.

Office hours: MF 10-10:50am T 1-2pm (or by appointment), Deady 10B.

Text: *Calculus for the Life Sciences*, by Frederick Adler, 3d edition. We will cover roughly chapters 1, 2, 3.

Class webpage:

<http://pages.uoregon.edu/vostrik/math246bfall19/index246b.html>

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 15% of your grade, the total quizzes will count as 15%, and the final exam will count for 30%.

Learning Outcomes: in this class we will learn how to

- compute and interpret limits at finite and infinite values;
- evaluate the continuity of a function on an interval;
- determine when it is appropriate to use L'Hôpital's Rule and compute limits in those instances;
- compute and interpret first and second derivatives for polynomial, logarithmic, exponential, and trigonometric functions;
- use product, quotient, and chain rules to compute derivatives;
- use graphical, numerical, and algebraic means to identify equilibria of discrete systems and determine their stability;
- find and interpret extrema of continuous and discrete functions;

- use the Mean Value Theorem, Intermediate Value Theorem, and Extreme Value Theorem to draw conclusions about extrema and roots of continuous functions.

Guidelines: 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: Derivatives, limits and continuity. 2.1-2.3.

Week 2: How to compute derivatives. 2.4-2.6.

Week 3: Second derivative, the Chain Rule and inverse functions. 2.7 and 2.9.

Week 4: Derivative of exponential, logarithmic and trigonometric functions. 2.8 and 2.10. Midterm I.

Week 5: Discrete dynamical systems. 1.5-1.6 and 1.10.

Week 6: Derivatives and dynamical systems. 3.1-3.2.

Week 7: Optimization. 3.3.

Week 8: Theorems about functions. 3.4. Midterm II.

Week 9: Limits and derivatives. L'Hôpital's rule. 3.5-3.6.

Week 10: Modeling of breathing. 3.9. Review.

Week 11: Final exam on Thursday, December 12, 8-10am.