Instructor: Jonathan "Nate" Wells
Email: wells6@uoregon.edu
Office: Deady 1C
Office phone: 541-346-0984
Office hours: See Canvas page

Course Description: This course will cover the core concepts in differential calculus required for students of mathematics and physical and social sciences, with focus on solving a wide class of optimization problems. Emphasis will be placed on mathematical modeling and the development of mathematical writing skills.

Prerequisites: MATH 112 or equivalent.

Textbook: *Calculus, Concepts and Contexts*, 4e by James Stewart. Reading assignments will be given on frequent basis, so daily access to the textbook is necessary. This textbook is also used for Math 252 and 253.

Course Website: Documents, a daily schedule, assignments, and grades will be posted on our Canvas page at `http://canvas.uoregon.edu`

Technology: A scientific or graphing calculator, or access to computation software (like Wolfram|Alpha or Excel) is **recommended** for completing some homework problems in this course. Calculators may be checked out from the Math Office in Fenton Hall and the UO Library system. Unless otherwise specified, **no calculators or other electronic devices** may be used during exams.

Communication: If you would like to contact me, I can most easily be reached by email weekdays between 10am and 6pm. While I try to answer email as soon as possible, in some cases, I may not be able to respond until the following school day. You are also welcome to stop by my office outside of office hours—I usually have at least a few free minutes to help.

Course Outcomes: By the end of the course, a student should be able to:

1. Determine the limit of a function at a point and at positive/negative infinity, using both algebraic and geometric techniques.
2. Use the limit of a function to describe asymptotic or discontinuous behavior.
3. Find the derivative of a function using the limit definitions of the derivative.
4. Interpret the derivative as a function and sketch its graph.
5. Apply differentiation techniques to simply the calculation of derivatives for polynomial, rational, algebraic, exponential, logarithmic, trigonometric, and inverse functions.
6. Sketch the graph of a function using knowledge of its derivative.
7. Use implicit differentiation to find the equation of a tangent line to a curve.
8. Find the linear approximation to a function at a specific value, graph the linear approximation, and use it to estimate the values of that function.
9. Model related rates problems and compute the rate of change in one quantity in terms of the rate of change of another.
10. Compute minimum and maximum values of a function using its derivative.
11. Model and solve optimization problems by finding critical values of functions.
12. Apply L'Hospital's Rule to compute the limit of a function in indeterminate form.
13. Use Newton's Method to approximate solutions to an equation that cannot be solved explicitly.

Workload: This course will require daily reading and class attendance, as well as weekly homework assignments. A typical, well-prepared student can expect to devote about 12 hours per week to this course (including time spent in class).

Grading Criteria: $A = 90 - 100\%$; $B = 80 - 89\%$; $C = 70 - 79\%$; $D = 60 - 69\%$; $F < 60$ (with upper and lower 2% of each division corresponding to $+/-$, respectively).

Your grade in the class will be determined by assessments of your proficiency in each of the *Course Outcomes*, weighted as follows:

1	WebWork Homework	10%
2	Written Assignments	10%
3	Daily Reading / Participation	10%
4	Weekly Quizzes	5%
5	Midterm Exams	30% (15% each)
6	Final Exam	35%

WebWork Homework: The best way to improve mathematical skills is through regular practice. Homework will be due weekly on Fridays at midnight (but note I likely won't be able to answer any emails after 6pm Friday). Homework assignments will be completed electronically through the WebWork portal. More information about WebWork can be found below. Additionally, each week an optional Extra Practice assignment will be posted. Each point earned on these assignments will count as 0.5 points of extra credit toward your WebWork homework grade.

Written Assignments: Solving mathematical problems is important; clearly communicating these solutions is even more so. Each week, a written assignment will be posted on Canvas, to be completed and handed in at the start of class on the following Monday. These assignments will usually include three more challenging problems, as well as a short essay prompt. Solutions to each problem must be written in complete sentences, and include brief explanation of the steps used. An example will be posted on Canvas. Additionally, a longer writing assignment will be due Week 10 of the term. More details about this assignment will be given at a later date.

Daily Reading / Participation: Mathematical knowledge takes time to develop, and understanding deepens upon revisiting a concept a 2^{nd}, 3^{rd}, or n^{th} time. Studying basic terminology and elementary examples in the textbook before class means that lectures can be spent clarifying and expanding ideas, rather than introducing them. Daily reading assignments will be posted under the "Assignments" tab of Canvas. These assignments will list the specific section(s) to read for each day, along with several basic questions to check comprehension. Answers are due by 3pm each day of class, and can be submitted by following the same link on Canvas where the assignment was found and then either a) uploading a Word / .pdf file, or b) by clicking the "Text Entry" button and typing directly into the text-box. Each assignment will be graded out of 10 points, according to the following rubric: 6 points for an earnest effort to answer all questions, and up to 4 points for correct answers. Any student who earned less than 10 points may resubmit a revised assignment within 1 week to earn up to 4 points back.

Weekly Quiz: Each week, a take-home quiz will be posted on Canvas, to be completed by the start of class on Wednesday the following week. Although the quizzes will not be proctored, it is expected that you will work on these quizzes on your own, without outside help from classmates, tutors, or the internet.

Midterm Exams: Two 110-minute midterm exams will be given during the term: tentatively, the first is scheduled for Wednesday, January 31 (Week 4), and the second for Wednesday, February 21 (Week 7).

Final Exam: A cumulative, final exam will be given on Tuesday, March 20, from 2:45-4:45 pm. *If you foresee a conflict with the time of the exam, please contact me during the first week of class so that appropriate arrangements can be made. Barring that, the final exam cannot be taken at any other time.*

A few notes on late assignments: Up to twice throughout the term, you may request a 2 day extension on either your WebWork or written assignments, but requests must be made prior to an assignment's deadline. No extensions will be given on reading assignments or quizzes, but at the end of the term, the two lowest reading assignment scores and the lowest quiz score will be dropped.

Accessibility: The University of Oregon is dedicated to creating inclusive learning environments. Please notify me as soon as possible if there are aspects of the instruction or design of this course that result in disability-related barriers to your participation. You may also wish to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or uoaec@uoregon.edu.

Academic Integrity: Students are allowed and encouraged to collaborate on most in-class and homework assignments. However, any work that you turn in for grading must be your own. Exams will be closed book, closed notes, and closed colleague, unless otherwise specified. All written work that references material outside of the textbook should be accompanied by an appropriate citation (APA or AMS format is preferred). The University of Oregon requires that all instances of academic dishonesty be reported, no matter the scope.

Tentative Schedule:

Week	**Sections Covered**	**Week**	**Sections Covered**
1	2.1 - 2.4	6	4.1, 4.2
2	2.6 - 2.8	7	4.3, Midterm 2
3	3.1 - 3.4	8	4.6
4	3.5, Midterm 1	9	2.5, 4.5
5	3.7 - 3.9	10	4.7, Review

Working with WebWork
WebWork is a free online homework system that allows for instant feedback on each question so that timely corrections can be made. However, since the assignments are graded automatically and electronically, it also requires careful attention to detail and precise use of correct mathematical syntax. You may log in to WebWork using your DuckID and password by clicking on the link on the weekly assignment under the "Assignments" tab on Canvas, or by using the following address: `https://webwork.uoregon.edu/webwork2/Math251-26550/`

When working on your assignment, you should have scratch paper available, and neatly write out your thought process in solving the problem. While WebWork does not grade you on this process, writing it out carefully will allow you to more easily return to the question at a later time, to track down any mistakes in your work, and to train you in the skills you will need to demonstrate on quizzes and exams.

If you have questions about a homework problem, one excellent resource is the "Email Instructor" button at the bottom of the WebWork screen. This button will send me a link to the problem you are currently on, as well a list of your current and past answers. It is essential that you include a short message describing what steps you've already taken to solve the problem (along with all calculations you've made) in order to help me diagnose the issue. On most homework problems, it is impossible for me to figure out what you've done incorrectly if I only see the answers you've submitted.