Instructor: Quinn La Fond

Email: qlafond@uoregon.edu

Office Hours: TBD

Prerequisites: MA112Z. In particular, a fluency in manipulating algebraic expressions, and a good understanding of polynomials, rational functions, exponential functions, logarithmic functions, and trigonometric functions will prove vital.

Class Meetings: Mon,Tues,Wed,Fri : 10 - 1050 am, STB 254

References: We will mainly follow chapters 2-4 of OpenStax 'Calculus: Volume I'. This is available for free download at openstax.org. I will do my best to maintain updated lecture notes on Canvas as well.

Final Exam: TBD

Calculator Policy: No calculator is needed for this course, and none will be permitted during exams, or daily quizzes. You are of course permitted to use calculators for homework, but are encouraged not to in order to replicate exam conditions.

Office Hours: My office hours are drop-in and available to all students. Typically, students come to my office hours to discuss questions from recent assignments, current grades, or concerns about the course. If you cannot make these hours, please send me an email and we will find a time that works for you.

Grading Policies: The breakdown of the grade for the course is as follows:

Attendance	5%
Daily Warm Ups	5%
Homework	15%
Midterm Exam 1	25%
Midterm Exam 2	25%
Final Exam	25%

Grades are assigned according to the following scale:

A	$90 - 100\%$
B	$80 - 89\%$
C	$70 - 79\%$
D	$60 - 69\%$
F	$\leq 60\%$

Plus and minus grades will be applied to those marks which are within 3 percentage points of the top and bottom of the respective grade bracket.

Daily Warm Ups and Attendance: Calculus is a major jump in mathematical maturity, and as such attending the lectures, and engaging with the material is vital to your success in this course. Because of this, attendance is mandatory, and is a not insignificant portion of your grade. Ideally attendance would be graded on an all or nothing basis, but I recognize that life happens, and it is therefore unrealistic to expect everyone to attend one hundred percent of the lectures. Attendance will be tracked with a daily warmup assignment worth 10 points, consisting of a one to two short questions. They will be on content covered in the previous lecture, and are intended to help you engage with the material. You will get 5/10 for attempting the daily warmup; this is your attendance grade. The other five points will be awarded based on accuracy, but I will grade more leniently than I would on an exam (i.e. more partial

credit will be given for having the correct idea or approach than on an exam). I will drop the lowest 4 quizzes.

Homework: Homework will be assigned every Monday, and due the following Monday. Each assignment will consist of two parts: a selection of problems chosen from the textbook, and 3-5 'challenge problems'. The textbook problems will be graded for completion, and consist of 5% of your homework grade. These are intended to increase familiarity with the concepts introduced in lecture. The 'challenge problems' will be graded for accuracy, and consist of 10% of your homework grade. These are intended to test your mathematical creativity and push your understanding of the concepts introduced in lecture. I encourage the use of outside resources, including but not limited to: friends, websites such as mathstackexchange, and other textbooks. However, if you make use of these resources, you must cite where and how you used them on your work. I cannot stop you from doing so, but I actively discourage the use of large language models (LLM), such as ChatGPT. These are prone to error, and limit your critical thinking skills; regardless, any use of an LLM must be cited like any other resource. **Plagiarism of any form, including failure to cite sources, will not be tolerated.**

Exams: There will be two midterms, in weeks 4 and 8. The content they cover is dependent on the pace of the course, and will be made available closer to their date. These midterms are not intended to be cumulative, but it is important to note that mathematics, especially calculus, builds upon itself, so the concept covered in midterm one will be vital to success on the second midterm. The final exam will be cumulative, with a slight emphasis on material covered in the last third of the quarter.

Late work and Makeups: University of Oregon requires these policies to be reason neutral, and as such **no late work is accepted, and there are no make ups for quizzes and midterms**. However, with the understanding that life gets chaotic, the lowest two homeworks in both categories (textbook problems, and challenge problems), will be dropped, and the lowest four daily quizzes wil be dropped. Moreover, in the even that your final exam grade is better than either, or both, of your midterms grades, your final exam grade will replace them. In particular, if you miss a midterm for whatever reason, you will be able to replace your midterm grade with your final exam grade.

In the case of specific AEC accommodations, religious observances, military deployment and University sponsored events, signed documentation should be provided as early in the term as possible and at least a week prior to the planned absence or request for an accommodation.

Important Dates Here are some important dates to bear in mind:

Monday, March 31st	Classes Begin
Saturday, April 5th	Last day to drop without a W
Monday, April 7th	Last day to add a class
Monday, May 26th	Memorial Day: No Lecture (Homework to be turned in on Tuesday);
Monday, June 9th	Final Exams Begin

See the calendar on Registrar's website for other Spring 2025 deadlines.

Accessibility: For those of you who are currently registered with Accessible Education Center for a documented disability, please present your paperwork to me during the first week of the term so that we can design a plan for you. Those of you with a disability (or who might) but are not registered with AEC should contact them as soon as possible. It is much more likely that measures can be taken to provide adequate special accommodation if the organization is done through AEC. I have attempted to provide documents that are accessible. Please let me know if you need additional accommodations.

Student Conduct: I plan to treat every student with respect and, as such, expect my students to show respect for me and for the class as a whole. Violations of the student conduct code results in the incident being included on your student conduct record as well as academic sanctions such as a failing grade on any coursework related to the violation or simply a failing grade in the course. The University of Oregon requires all instances of cheating be reported, no matter how small. Cheating includes, but is not limited to:

- Looking at another student's exam during a test.
- Failure to cite sources/resources on a challenge problem set.
- Copying the work of another person (student or otherwise) and submitting it as your own.
- Using any materials except those explicitly approved during a test-taking situation.
- Resubmitting graded work that was altered after being returned.

For a list of other descriptions of cheating, see the Student Conduct Code.

Prohibited Discrimination and Harassment Reporting: I am a student-directed employee. For information about my reporting obligations as an employee, please see Employee Reporting Obligations. Students experiencing any form of prohibited discrimination or harassment, including sex or gender based violence, may seek information on safe.uoregon.edu, respect.uoregon.edu, titleix.uoregon.edu, or aaeo.uoregon.edu or contact the non-confidential Title IX office (541-346-8136), AAEO office (541-346-3123), or Dean of Students offices (541-346-3216), or call the 24-7 hotline 541-346-SAFE for help. I am also a mandatory reporter of child abuse. Please find more information at Mandatory Reporting of Child Abuse and Neglect.

Other Important University Policies and Resources: Individuals and the campus as a whole may experience hardships, both short-term and long-term, as a result of factors that pertain to school, family, religion, and other facets of adult life. I endorse the expressions of support provided at:

`https://provost.uoregon.edu/standard-university-syllabus-language`

regarding mental health and wellness, basic needs, and religious observations.

Course Objectives:

a) Learning how to differentiate - this is necessary if you wish to use calculus to solve optimization problems.

b) Learning how to sketch graphs of functions - this is necessary to help identify where to search for local/global extrema when trying to optimize.

c) Understanding some basic facts about limits - this is needed for two reasons: to incorporate an understanding of the geometric interpretation of the derivative as the slope of the tangent line of a graph, and also to aid in sketching graphs of functions exhibiting asymptotic or discontinuous behavior.

d) Students should be able to solve related rates problems. These are less central than optimization, but can be introduced early as a source for problems that require students to practice modeling.

e) Students should be able to find the linear approximation to a function at a specific value of the variable, graph the linear approximation and the function on the same pair of axes, and use the linear approximation to find approximations to values of the function near the point at which the approximation is taken

Learning Objectives

a) Evaluate limits using the algebraic limit laws

b) Identify limits at $\pm\infty$ for rational functions

c) Identify limits of rational functions involving cancellation of linear factors from numerator and denominator

d) Compute left and right limits for a function (or decide they do not exist), given an expression for the function.

e) Identify the points where common functions are continuous and/or differentiable, and the same for functions given graphically.

f) Identify limits, as well as left and right limits, for functions given graphically.

g) State and use the product rule, quotient rule, chain rule, and linearity rules for derivatives.

h) State the definition of the derivative in terms of a limit of difference quotients.

i) Interpret, including units, the derivative as an instantaneous rate of change of a quantity defined in an applied context.

j) Recognize the derivative as the slope of the tangent line.

k) Use calculus to approximate the value of a function near a point p, given information about the function and/or its derivatives at p.

l) Compute derivatives of functions involving polynomials, exponentials, logarithms, and trig functions, using a combination of theorems, differentiation rules, and definitions.

m) Find the equation for the tangent line of a curve at a given point.

n) Calculate derivatives via implicit differentiation

o) Use the methods of calculus to find asymptotes, local minima/maxima, intervals of concavity, intervals where the function is increasing/decreasing, and inflection points. Relate these properties to the graph of the function.

p) Find extrema of a function on open and closed intervals.

q) Solve optimization problems, including word problems.

r) Solve related rates problems, including word problems.

s) Use L'Hopital's rule to evaluate indeterminate forms of limits, including cases requiring multiple applications.

t) Use the Intermediate Value Theorem to prove that roots of a function exist in a given closed interval.

u) State the Mean Value Theorem.

v) Understand and solve simple differential equations via antiderivatives.