

**Introduction to Analysis I**  
**M383-801,802 Fall 2020**

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**Course Info:** Posted through Desire2Learn (D2L). You should check the D2L course page regularly for up to date information about the course.

**Delivery method:** Internet/Online. The online delivery will be **asynchronous**. Video lectures will be posted in “Content” in D2L, along with the date by which each video should be watched. Forums will be opened for each section under “Discussions” in D2L, where everyone can post questions about the lecture and homework, as well as discuss class material and answer questions from others. Common questions in the Forum will be addressed in Office Hours.

**Virtual Office Hours:** M, W, F 11:00 - 12:00 Hosted in my WebEx Virtual Office, which can be accessed in at least two ways:

**url:** <https://montana.webex.com/meet/j39v482>

**meeting number:** 929 474 382

**Prerequisite:** M273Q and either M242, M333, or consent of instructor.

**Textbook:** *The Way of Analysis*, by Robert S. Strichartz, Jones and Bartlett Publishers. ISBN 978-0-7637-1497-0.

**Course Description:** This is a proof-based course. The course starts with definition of “real numbers” through rigorous theory of limits. After that, topology of real line including the concepts and properties of open, closed, and compact sets is discussed. Then definition and property of continuous functions are discussed. Finally, differential calculus is introduced and some important theorems in Calculus are proved rigorously. Chapters 1 to 5 of the textbook will be covered.

**Learning Outcomes:** Upon completion of this course, a student will be able to: 1) Apply the basic proof techniques, including direct proofs, indirect proofs, and mathematical induction; 2) Construct counterexamples, in each of the following areas, to conjectures that are actually false even though they look plausible and resemble given results; 3) Define the terms associated with sequences and be able to prove the major results about their limits; 4) Define the terms (for example, continuity and uniform continuity) associated with limits in the context of functions and be able to prove the major results; 5) Define the terms associated with differentiation and be able to prove some of the major results about derivatives (for example, the Product Rule, the Mean Value Theorem, and the First Derivative Test).

**Grading:** Homework 60%, Midterm 20%, Final Exam 20%.

**Homework:** Homework will be assigned regularly on D2L, and must be **submitted via Gradescope** course “M383 Fall 2020”. A module “Gradescope Instruction” was created in Content of D2L which contains some video tutorials, and also a link to the Gradescope help page.

**Midterm:** Due Friday, October 2 at 8:00pm, should be submitted via Gradescope.

**Final:** Due Friday, November 20 at 8:00pm, should be submitted via Gradescope.

Both Midterm and Final exams will be **posted 48 hours prior** to the due time in Content under module “Homework” in D2L, and the same exam will also be released in Gradescope as an online assignment. It should be submitted via Gradescope. Please submit on time, and **late submission will NOT be accepted**. You are **welcome to** use class notes, the textbook, posted homework solutions, and posted video lectures to help you. You **are not allowed to** discuss problems with other humans, seek online help outside of the options listed in the previous sentence, or access/view work or solutions to any of these problems shared in person or via digital means.