Introduction to Analysis II
M 384-801 Spring 2021

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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 10:30 - 11:30 am Hosted in my WebEx Virtual Office, which can be accessed in at least two ways:

https://montana.webex.com/meet/j39v482
meeting number: 929 474 382

Prerequisite: M 383, 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 and a continuation of M383, and it will cover the following subjects. **Integral Calculus** theory including integral of continuous function, fundamental theory of calculus, useful integration formulas, definition of Riemann integral and its properties. **Sequences and Series** of functions including numerical Sequences and Series, uniform convergence, power series, approximation by polynomials, and equicontinuity. **Multivariable Calculus** including differentiability, partial derivative, the chain rule, and higher order partial derivatives. Chapters 6,7 and 10 of the textbook will be covered.

Learning Outcomes: Upon completion of this course, a student will be able to: 1) Understand the rigorous definition of Riemann integral and under what conditions a function is Riemann integrable; 2) Understand the proof of the fundamental theory of calculus and its application in deriving important integral formulas; 3) Distinguish the difference between conditional and absolute convergence of a series, understand the rearrangement of infinite series, prove convergence of a series by convergence test; 4) Understand uniform convergence and its implication, properties of power series; 5) Understand the theory of approximating continuous functions by polynomials, equicontinuity and Arzela-Ascoli Theorem; 6) Define partial derivative and differentiability of Multivariable functions, understand the relationship between differentiability and existence of partial derivatives, Taylor expansion of Multivariable functions.

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

Homework: Homework will be assigned regularly on D2L, and must be **submitted via Gradescope** course "M384 Spring 2021". 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 Wednesday, March 3 at 8:00pm, should be submitted via Gradescope.

Final: Due Wednesday, April 28 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 "Exam" 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.