SYLLABUS
MA 5471 Real Analysis
Fall 2025

Professor: Dr. Mark Demers
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Lectures: Bannow 341, Wednesdays 6:30 – 9:00 p.m.

Office Hours: Mondays & Wednesdays, 5:00 – 6:00 p.m.

Required Text: **Introduction to Real Analysis**, 4th edition, by R.G. Bartle and D.R. Sherbert.
Published by John Wiley & Sons, Inc.
ISBN 978-0471433316

Class Website: **http://faculty.fairfield.edu/mdemers/analysis** Bookmark this page!
This is a valuable resource that contains the assigned problem sets, links to the class lectures, and important information and announcements regarding the class.

Prerequisites

Knowledge of elementary and multivariable calculus including the theory and techniques of single variable continuous functions, basic differentiation theory and techniques and basic integration theory and techniques.

Outline of Topics by Week

Session	Sections	Material Covered
9/3	2.1, 2.2	Introduction; Axiomatic approach to the real numbers: Algebraic and order properties
9/10	2.3-2.5	Completeness properties; consequences of Supremum Property
9/17	3.1, 3.2	Infinite sequences and properties of limits
9/24	3.3, 3.4	Sequences and subsequences; Bolzano-Weierstrass Theorem
10/1	3.5, 3.6	Cauchy sequences, properly divergent sequences
10/8	4.1-4.3	Limits of functions
10/15	5.1-5.3	Continuous functions
10/22	5.4, 5.6	Uniform continuity, inverse functions
10/29	6.1, 6.2	Derivatives, Mean Value Theorem
11/5	6.3, 6.4	Taylor's Theorem and L'Hospital's Rules
11/12	7.1-7.3	Riemann Integral, Fundamental Theorem of Calculus
11/19	8.1, 8.2	Limits of sequences of functions, interchanging limits
11/26		Thanksgiving Break
12/3	3.7, 9.1, 9.2	Infinite series, absolute convergence
12/10	9.3, 9.4	Conditional convergence, series of functions
12/17		Last Day/Optional Lecture

This outline is only a broad indication of topics to be covered and may fluctuate depending on our pace during the term. The numbered sections refer to the required text for the class. There may be additional handouts during the course of the term that contain required material.

Attendance

In my experience, attendance is an important part of doing well in a course. Although no one is required to participate during class, you are encouraged to do so and I hope you will feel comfortable participating throughout the course of the term. Attendance for all quizzes is mandatory and make-ups will be given only for absences due to documented illness or other valid reasons. You must notify me **in advance** if you plan to miss a

quiz for an official university event. It is your responsibility to remain informed about what is going on in class and to obtain notes from classes you miss during the semester.

Problem Sets

Six problem sets will be assigned throughout the semester and due dates will be announced when the assignment is given (usually 2-3 weeks). Because they constitute a major component of the course, the problem sets will be substantial, comprising both examples and proofs to work out on your own.

You should read the text and use it as a reference to complete the problem sets. I also expect you to read the upcoming sections of the text before each class so that you have some idea what material we will cover each week. This will enable you to keep pace with a fast-moving class as well as be better prepared to ask questions during class. Reviewing your notes and the text during the week will also help to keep the ideas fresh in your mind for the next class.

You are invited to attend office hours to discuss the material presented in class or in the text. If you cannot meet during office hours, email me for an appointment – I am available most days. You may also send me questions by email. You are also encouraged to form study groups and work with other students in the class if you find that helpful. But all work you hand in must be written by you and be your own intellectual property. If you work with a tutor, you cannot have your tutor give you solutions to the assigned problems. Tutors should help with concepts and practice, but the assignments you hand in must be your own work. Evidence of plagiarism on an assignment will result in a zero for the entire assignment. Please refer to the Fairfield Honor Code or ask me if you need further clarification on this issue.

Quizzes

Every two or three weeks, we will have a short, in-class quiz. Quizzes will comprise 2 or 3 questions and will focus on key concepts such as, limits, continuity, definition of derivative and integral, etc. You may be asked for definitions or to construct brief proofs similar to what you have seen in class or on the problem sets. All quizzes will be announced in advance. You are required to attend class on a quiz day.

Grading

Your final grade will be determined by a weighted average of your quiz and problem set grades.

Problem Sets:	80%	(all problem sets weighted equally)
Quizzes:	20%	(all quizzes weighted equally, with lowest grade dropped)

Accommodations for Disabilities

If you require special accommodations, please contact the Office of Accessibility within the Academic Commons located in the Library, (203) 254-4000 Ext. 2615, or email ooa@fairfield.edu. Please notify me within two weeks of the start of the semester of any arrangements you make regarding accommodations.