

Math 572- Elementary Real Analysis



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Office Hours

M-Th
Afternoons
after 2:00

If you cannot
meet during
this time, we
can make
arrangements
to meet at
another time.

**Course
Philosophy**

Course Content

**Text: Advanced
Calculus (Schaum's
Outline by Wrede and
Speigel)**

Week 1-Limits and
Continuity

Chapter 3

Week 2- Derivatives

Chapter 4

Week 3-Integrals and
the Fundamental
Theorem of Calculus

Chapter 5

**Test 1
(material
through
week 3)**

Week 4-Series and
Sequences

Chapter
11

Week 5-Differential
Equations

Content and Process Learner Outcomes

Through assignments, quizzes, exams, and in-class work, students will demonstrate knowledge of content and process objectives that include the following:

- Modeling real-world phenomena with functions and their derivatives and integrals.
- Making connections among numeric, symbolic, graphical representations of functions, their derivatives and integrals, and real-world models
- Correctly choosing and applying appropriate functions and/or their derivatives and integrals to real-world problems, including those best modeled by linear, quadratic, exponential, polynomial, logarithmic, radical, rational, absolute value, and piece-wise, and algebraic combinations of any of the aforementioned.

- Investigating limits and continuity numerically, symbolically, graphically, and logically.
- Interpreting different aspects of functions numerically, symbolically, graphically, and logically, including modeling real-world phenomena with intercepts, asymptotes, maxima/minima, domain/range, increasing/decreasing, and end behavior of functions, using the derivative.
- Modeling and solving a variety of problems using the tools of calculus, including limits, derivatives, and integrals.

Performance Learner Outcomes

There are two related objectives for this course. (1) Real Analysis is the study of real valued functions of real-valued variables. The subject is a rigorous study of functions and their relationship to mathematics. In particular it is the study of Calculus from an advanced standpoint. Participants should expect to be able to prove important theorems in the context of advanced calculus. (2) Real Analysis has applications to much of high school and advanced mathematics. Participants, as professional teachers, should expect to be able to make connections

Materials
Week 8-Differential Equations

Separate Materials

Final Exam (comprehensive)

Through assignments, quizzes, exams, and in-class work, students will demonstrate knowledge process objectives that include the following:

Problem-Solving

- Working on extended problems
- Using diverse methods to solve problems
- Using questioning and generalization in solving problems
- Modeling real-world phenomena mathematically.

Group Work

- Working cooperatively
- Sharing ideas
- Dividing tasks effectively among group members

Writing and Communication

- Reading and understanding complex problems
- Summarizing the essential ideas of a problem
- Describing methods used to approach a problem
- Expressing solutions in written and verbal form
- Evaluating and improving the quality of written work.

with the content in lower level analysis courses. These courses, traditionally, include high school Algebra II, Precalculus or Math Analysis and Calculus Levels.

Technology

A graphing calculator is required for this class. The Texas Instruments TI-83 (+) is recommended. Some 3-D graphing software may also be helpful, such as found in Maple or on the TI-89

Assessments	Percent of Final Grade	Final Point Distribution	Final Grade
Written Homework	25%	93-100%	A
Participation	25%	90-92%	A-
Midterm Exams	25%	87-90%	B+
Final Exam	25%	83-86%	B
		80-82%	B-
		77-79%	C+
		73-76%	C
		70-72%	C-
		67-69%	D+
		63-66%	D
		60-62%	D-
		Below 60%	F

