MATH 3372 INTRODUCTION TO ANALYSIS(3 credit hours)

Elmira College

SPRING 2025

Required Text:

1. Terence Tao(2016). ***Analysis I***(3rd ed.). Springer.
2. Robert G. Bartle(2011). ***Introduction to Real Analysis***(4th ed.). Wiley.

Supplemental readings might be included to illustrate or expand on textbook readings.

Pre-requisites: MATH 2261 Mathematical Reasoning and Proofs; MATH 3009 Introduction to Calculus III

Course Description

This course is designed to provide students with a rigorous and comprehensive introduction to the mathematical analysis. It delves into the basic principles of mathematical analysis, emphasizing the development of a solid theoretical framework to enhance problem-solving skills and promote a deeper appreciation for the subject. Topics include the real number system, limits of functions and sequences, differentiation and more.

Course Objectives and Goals

- Define and comprehend the properties of real numbers;
- Develop a rigorous understanding of limits and continuity;
- Investigate the rules of differentiation and their applications;
- Develop the ability to construct rigorous mathematical proofs;
- Develop a strong mathematical mindset for future studies in calculus-related fields.

Evaluation of Performance

Your grade will be based upon your performance on exams, assignments, and participation.

5 Assignments	25%
4 Quizzes	40%
Midterm Exams	15%
Final Exam	20%
Total	100%

Grades will be assigned as follows:

A	93% and above	B-	80 - 82%	D+	67 - 69%
A-	90 - 92%	C+	77 - 79%	D	63 - 66%
B+	87 - 89%	C	73 - 76%	D-	60 - 62%
B	83 - 86%	C-	70 - 72%	F	59% or below

Withdrawal Policy: Please see Elmira College Bulletin for information on this policy.
Academic Honesty: Please read the section on Academic Honesty in the **Code of Conduct**. Briefly, academic dishonesty includes: cheating, fabrication, facilitating academic dishonesty, and plagiarism. Ask if you have any questions on whether something constitutes as academic dishonesty. All work must be original and new. Past assignments from current or other courses will not be accepted. Academic dishonesty will not be tolerated. It will result in zero on the assignment, and a report will be filed with the school. Continued practice will result in failure of the class. Institutional penalties may also apply with repeated acts of academic honesty.

Student Responsibility:

- It is your responsibility to keep track of assignments and due dates.
- You should ask questions concerning assignments and lectures, if you need any clarifications.
- If you are struggling in class, have concerns, and/or unsure about expectations, please stop by during office hours or make an appointment for another time.

Tentative Schedule of Topics

Topic	Materials	Tasks & Evaluations
The Real Numbers	Chapter 1	
The Construction of the Real Numbers	Chapter 2	Assignment 1
Sequences and Their Limits	Chapter 3	
Limit Theorems	Chapter 4	Quiz 1
Limits of Functions	Chapter 5	
Limits of Sequences	Chapter 6	Assignment 2
Differentiation of Functions	Chapter 7	
Continuity and Gauges	Chapter 8	Quiz 2
The Derivative	Chapter 9	
The Mean Value Theorem	Chapter 10	Midterm Exam
Taylor's Theorem	Chapter 11	
Riemann Integral	Chapter 12	Assignment 3
The Fundamental Theorem	Chapter 13	
Pointwise and Uniform Convergence	Chapter 14	Quiz 3
The Exponential and Logarithmic Functions	Chapter 15	
Series of Functions	Chapter 16	Assignment 4
Improper and Lebesgue Integrals	Chapter 17	
Convergence Theorems	Chapter 18	Quiz 4
Absolute Convergence	Chapter 19	
Finite and Infinite Sets	Chapter 20	Assignment 5
Infinite Series	Chapter 21	
Continuous Functions on R	Chapter 22	Final Exam