

Math 2033 Mathematical Analysis

Course outline - Fall 2023-2024

Course Home page

<https://canvas.ust.hk/>

Instructor

Dr. Jishan Hu

Contact Details: Room 3447; Phone: 2358-7434; e-mail: majhu@ust.hk

Office Hour: 15:00–16:00, Mon. & 10:30–11:30 Fri.

Teaching Assistant

Mr. FEI Zetao

Contact Details: e-mail: zfei@connect.ust.hk

Office Hour: 16:00-17:00, Tue. & Wed.

Math Support Center, Room 3011-3013 (Lift 3 or Lift 2)

Meeting Time and Venue

Lectures: L1: 16:30–17:50, Mon. & 12:00–13:20 Fri., Room 2465

Tutorials: T1A : 18:00-18:50, Thu., Room 2306

T1B : 18:00-18:50, Mon., Room 4620

Course Description

Duration: one semester. Credits: 4 units.

This course teaches mathematical analysis for undergraduates who study mathematics, physics, economics, and engineering.

Exclusions: MATH 2043

Prerequisite: A passing grade in AL Pure Mathematics / AL Applied Mathematics; OR MATH 1014 OR MATH 1020 OR MATH 1024

Assessment Scheme

Based on one midterm examination, one final examination, and the homework assignments.

Homework: 20%; Midterm Exam: 40%; Final Exam: 40%.

Midterm:

14:00 – 17:00 Oct 22 (Sunday) Venue: LTD

Student Learning Resources

Textbooks:

Lecture Notes by Jishan Hu

Teaching Approach

Lectures: The instructor will focus on illustrating the concepts of the course content.

Tutorials: We will focus on examples and problem solving skills. The students will be asked to demonstrate how to solve the homework problems. The performance will be counted towards their course grades.

Intended Learning Outcomes

Upon successful completion of this course, students should be able:

1. to understand the rigorous formulation of calculus;
2. to have solid foundation for future study in pure mathematics, applied mathematics, and other physical sciences.

Course Schedule

Week	Content	Remarks
1	Real Numbers	
2	Basic Topology: Countable & Uncountable Sets	
3	Basic Topology: Open & Closed Sets	
4	Basic Topology: Compact Sets	
5	Numerical Sequences: Convergence, Upper and Lower Limits	
6	Numerical Series: Series, Power Series, Arithmetic Operations	
7	Continuity: Limits, Continuity, Compactness	
8	Continuity: Connectedness, Discontinuities, Monotonic Functions	
9	Differentiation: Mean Value Theorem	
10	Differentiation: L'Hospital's Rule, Taylor's Theorem	
11	Integration: Definition, Properties	
12	Integration: Fundamental Theorem	