

Math 3043 Honors Real Analysis

Syllabus - Fall, 2017

Course Home page

<http://www.math.ust.hk/~majhu>

Please check the course home page for news regarding the course.

Instructor

Dr. Jishan Hu

Contact Details: Room 3455; Phone: 2358-7434; e-mail: majhu@ust.hk

Office Hour: 09:00 – 11:00, Tue. & Fri.

Teaching Assistant

Mr. Xuanzhong DAI,

Contact Details: Room 3209B; Phone: 2358-7468; e-mail: xdaiac@connect.ust.hk

Meeting Time and Venue

Lectures:

Tue.: 19:30 – 20:50, Room 5564 (Lift 27-28)

Fri.: 19:00 – 20:20, Room 5564 (Lift 27-28)

Tutorials: Mon.: 18:00 – 18:50, Room 1511 (Lift 27-28)

Course Description

Duration: one semester. Credits: 4 units.

This course is the continuation of Math 2043. It teaches mathematical analysis for advanced undergraduates who study mathematics, physics, economics, and engineering.

Exclusions: Math 3033

Prerequisite: Grade A- or above in Math 2043

Assessment Scheme

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

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

Student Learning Resources

Textbooks:

Walter Rudin, Principles of Mathematical Analysis, 3rd Ed., McGraw-Hill.

Some other supplemental materials will be provided by the instructor.

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	Series of Functions, Uniform Convergence	
2	Equicontinuity, the Stone-Weierstrass Theorem	
3	Power Series	
4	Fourier Series	
5	the Contraction Principle	
6	the Inverse Function Theorem, the Implicit Function Theorem	
7	Lebesgue Measure	
8	Measure Space	
9	Measurable Functions, Integration	
10	Extention of Integration, Convergence Theorems	