

Math5333 Analysis

Professor: Min Ru

Office: PGH674

Office Hours: By appointment(e-mail or phone)

Phone: 7147433477(O), 8327780480(H)

Email Address: minru@math.uh.edu

Fax: 7137433505(attn: Prof. Min Ru)

Course Format: On-line course through webct. This is the rigorous theorem/proof-type course in analysis. The goal of the course is to teach students mathematical reasoning and the construction of proofs in the environment of real numbers. Topics covered include the topology of the Reals, convergence and limits, and the proofs of well-known calculus theorems such as the Mean Value Theorem, the Intermediate Value Theorem, the Inverse Function Theorem, and the Fundamental Theorem of the Calculus. Note that the schedule of summer is **very tight**. We need to finish the material within one month, where, otherwise, would take three months. So **don't get behind!!!**.

Textbook: *Analysis* by Steven R. Lay, 4th edition, Prentice Hall.

Syllabus:

Chapter 3: The Real Numbers

Natural numbers and induction, ordered fields, the Completeness Axiom, topology of the real numbers, compact sets, omit Metric Spaces

Chapter 4: Sequences

Convergence, limit theorems, monotone sequences and Cauchy sequences, subsequences

Chapter 5: Limit and Continuity

limits of functions, continuous functions, properties of continuous functions, cover uniform continuity in the context of Chapter 7 and omit continuity in Metric Spaces

Chapter 6: Differentiation

The derivative, the Mean Value Theorem, Hopital's Rule and Taylor's Theorem

Chapter 7: Integration

The Riemann integral, properties of the Riemann integral. The Fundamental Theorem of the Calculus

Grading Policy: Homework 25% ,Midterm Examination 35%, Final Examination 40%.

Homework: Homework will be assigned right after we finish the materials for each chapter. Every time, the due date is different. Homeworks must be handed in by **5:00pm** on the due date– **by e-mail**. Late homework will not be accepted.

Exams: Open book, any notes and homework. Midterm exam is on Saturday June 13, at PGH646, 8:30am-11:30am. The final is on Tuesday, June 30 from 5:30pm-8:30pm.