

**Syllabus for M361K, Spring 2005**  
**Instructor Ki-ahm Lee**

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**Office Hours:** MW, 9:50-10:50am

**Text:** Introduction to Real Analysis 3rd edition written by Bartle and Sherbert.

**Prerequisite and degree relevance** Either consent of Mathematics Advisor, or two of M341, 328K, 325K (Philosophy 313K may be substituted for M325K), with a grade of at least C. May not be counted by students with credit for M365K with a grade of C or better.

**Course description** This is a rigorous treatment of the real number system, of real sequences, and of limits, continuity, derivatives, and integrals of real-valued functions of one real variable.

The real number system: the axiomatic description of the real number system as the unique complete ordered field, with special emphasis on the completeness axiom; the elementary topology of the real line.

Real sequences: the definition and elementary properties of sequential limits; subsequences and accumulation points; monotone sequences; inferior and superior limits; the Bolzano-Weierstrass theorem.

Limits and continuity of functions: the definition and elementary properties of limits of functions, including the usual variations on the basic theme (e.g., one-sided limits, infinite limits, limits at infinity); continuity; the fundamental facts concerning continuous functions on intervals (e.g., Intermediate Value Theorem, Maximum-Minimum Theorem, continuity of inverse functions, uniform continuity on closed intervals).

Differentiation: the definition and geometric significance of the derivative; differentiation rules; the Mean Value Theorem and its consequences; Taylor's Theorem; L'Hospital's rules; convexity.

Riemann Integration: the definition and elementary properties of the Riemann integral; the integrability of continuous functions and monotone functions; the Fundamental Theorems of Calculus.

**HW:** HW will form 20 % of the total grade of the course. Homework will be assigned by me every lecture. You can also find the assigned problems in my homepage. Homework given each week is due on Friday, the next week. Each HW will be worth 10 points. The two worst scores will be dropped. Homework must be neatly done and must be stapled if more than one page is involved. Late homework will not be accepted.

**Midterms:** Exam Date: it will be announced at class and on my homepage. The midterm will form the 40% of the total grade of the course.

**Final Exam:** Exam Date: it will be announced at class and on my homepage. The final exam will form the 40 % of the total grade of the course. It will cover materials studied after the midterm.

**Grading:** Homework 20%; Midterm 40 %; Final exam 40%. If your total score is around the median of the class, you may expect the final grade B-. So don't worry about curving. Somebody, whose score may be below the half of the median, is strongly suggested to visit the Instructor frequently to catch up with this class.

**Make-up exam** If you want to take a make-up exam, you should tell the instructor PRIOR to the exam date. The request must be supported by a properly documented excuse. The make-up exam will be harder than the standard exam.

**Calculator:** Only simple scientific calculator is allowed at the exams.

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