

FOUNDATIONS OF ANALYSIS

Syllabus

Instructor: Michael Henle

Office Hours: T and Th 3:30-5:00 P.M. in King 202

Phone: x58383 or 775-7676

Text: **Understanding Analysis** by Stephen Abbott (Springer Verlag, NY, 2000)

Evaluations:

Written Problem Solutions (due DAILY in class)	200
Midterm Exams (due October 22 and November 24)	200
Final Exam (due Tuesday, December 21 at 4 PM)	<u>100</u>
TOTAL:	500 points

Course Goals:

1. To build intuitive understanding of numbers, the real numbers, limits, sequences, functions, continuity, differentiation, and integration.
2. To study the logical structure of classical analysis (i.e. the calculus).
3. To practice writing clear and correct proofs.

Outline of the Semester:

Week of	Topics	Reading
September 4	Irrational numbers	§1.1
September 10	Proofs and logic	§1.2-1.3
September 17	Completeness of the real numbers	§1.3-1.4
September 24	Limits of infinite sequences	§2.1-2.3
October 1	Completeness and limits	§2.3-2.6
October 8	Basic topology of the real line	§2.7, 3.1-3.2
October 15	Compactness and connectedness	§3.3-3.4
Fall Break		
October 29	Functional limits and continuity	§4.1-4.4
November 5	Compactness, connectedness and continuity	§4.5-4.6, 5.1
November 12	Differentiation	§5.2-5.4
November 19	Uniform concepts	§6.1-6.3
November 26	Series of functions	§6.4-6.5
December 3	Integration	§7.1-7.3
December 10	The Fundamental Theorems	§7.4-7.5