MATH 473/576
Introductory Real Analysis (4 units)

Course Outline

Sections	Topics	# of weeks
5–8	**Foundations:** Limits; continuous functions; fundamental theorems; least upper bounds; uniform continuity.	3.0
9–14	**Derivatives and Integrals:** Derivatives and differentiation; significance of the derivative; convexity and concavity; inverse functions; parametric curves; Riemann sums and integrals; the Fundamental Theorem of Calculus.	5.0
22–24	**Infinite Sequences and Infinite Series:** Infinite sequences; infinite series; uniform convergence; power series.	5.0
	Tests	1.0

Textbook: *Calculus*, 4th edition, by M. Spivak.

Adopted: Fall 2006; Revised: Fall 2010, Fall 2013.

OR

Sections	Topics	# of weeks
2.1–2.5	**The Real Numbers:** Algebraic properties; order and absolute value; completeness and least upper bounds. (Note: This material is mostly a review from Math 267.)	1.0
3.1–3.7	**Sequences and Series:** Sequences and their limits; limit theorems; monotone sequences; the Bolzano–Weierstrass theorem; Cauchy's criterion; introduction to infinite series.	2.0
4.1–4.3	**Limits:** Limits of functions; limit theorems.	1.0
5.1–5.4, 5.6	**Continuous Functions:** Continuous functions and their basic properties; continuous functions on intervals; uniform continuity; monotone and inverse functions.	2.0
6.1–6.4	**Differentiation:** Derivatives; the Mean-Value Theorem; l'Hospital's rules; Taylor's theorem.	2.0
7.1–7.3	**The Riemann Integral:** Riemann sums and basic properties of the Riemann integral; classes of Riemann integrable functions; the Fundamental Theorem of Calculus.	2.5
8.1–8.2	**Sequences of Functions:** Pointwise and uniform convergence; interchange of limits.	1.0
9.1–9.4	**Infinite Series:** Absolute and conditional convergence; tests for convergence; series of functions; power series.	1.5
	Tests	1.0

Textbook: *Introduction to Real Analysis*, 4th edition, by R.G. Bartle and D.R. Sherbert.

Adopted: Fall 2013.