清華大學數學系
高等微積分一　**Advanced Calculus (I)**

Math 2010-02 Fall 2008

Chapter 1. Euclidean Spaces
1.1. Basic set theory (9/16)
1.2. The real number system (9/16)
1.3. Algebraic structure of Euclidean spaces (9/19)
1.4. Hyperplanes (9/23)
1.5. Norms, inner product, and metrics (9/23)

Chapter 2. Sequences and Series
2.1. Sequences and convergence (9/26)
2.2. The Bolzano-Weierstrass theorem (9/30)
2.3. Limits supremum and infimum (9/30)
2.4. Series and convergence (10/7)
2.5. Absolute convergence (10/7)

Chapter 3. Topology of Euclidean Spaces
3.1. Open and closed sets (10/14)
3.2. Interior, closure, and boundary (10/17)
3.3. Compact sets (10/21, 10/24)
3.4. Connected sets (10/28, 10/31)

Chapter 4. Continuous Functions
4.1. Limits of functions (11/7)
4.2. Continuity (11/11, 11/14)
4.3. Continuity and compactness (11/18)
4.4. Continuity and connectedness (11/21)

Chapter 5. Uniform Convergence
5.1. Uniform convergence of sequences (11/25, 11/28)
5.2. Uniform convergence of series (12/2, 12/5)
5.3. Power series (12/9, 12/16, 12/19)
5.4. Analytic functions (12/23)
5.5. The Arzelà-Ascoli theorem (12/26, 12/30)
5.6. The Stone-Weierstrass theorem (1/2, 1/6)

Midterm Exam 1 (Tuesday, Nov 4): Chapter 1, Chapter 2, Sections 3.1-3.2
Midterm Exam 2 (Friday, Dec 12): Sections 3.3 and 3.4, Chapter 4, Section 5.1
Final Exam (Tuesday, Jan 13): Chapter 1 ~ Chapter 5