國立清華大學
微積分二 Calculus (II)

Math 1020-05 Spring 2010
Textbook: *Calculus* by Salas, Hille, Etgen (10th edition)
Instructor: Kuo-Chang Chen

Chapter 11. Infinite sequences (2 weeks)
11.1. Sequences of real numbers
11.2. Limit of a sequence
11.3. Some limit theorems
11.4. l'Hôpital's rule
11.5. Improper integrals

Chapter 12. Infinite series (3 weeks)
12.1. Series and convergence
12.2. The integral test and comparison tests
12.3. The ratio test and the root test
12.4. Absolute convergence and conditional convergence
12.5. Alternating series
12.6. Taylor polynomials and Taylor series
12.7. Power series

Chapter 13. Vectors in Three-Dimensional Space (1 week)
13.1. Three dimensional coordinate systems
13.2. Dot product of vectors
13.3. Cross product of vectors
13.4. Lines and planes
13.5. Quadratic surfaces

Chapter 14. Vector Functions (1.5 weeks)
14.1. Vector functions and space curves
14.2. Differentiation and integration of vector functions
14.3. Arc length and curvature
14.4. Some applications in mechanics

Chapter 15. Functions of Several Variables (2 weeks)
15.1. Level curves and level surfaces
15.2. Partial derivatives
15.3. Gradients and directional derivatives
15.4. The chain rule
15.5. Tangent lines and tangent planes
15.6. Maximum and minimum values

Chapter 17. Multiple Integrals (2 weeks)
17.1. Repeated integrals
17.2. Double integrals
17.3. Double integrals in polar coordinates
17.4. Triple integrals
17.5. Triple integrals in cylindrical and spherical coordinates
17.6. Change of variables in multiple integration

Chapter 18. Line Integrals and Surface Integrals (2.5 weeks)
18.1. Line integrals
18.2. Green's theorem
18.3. Parametric surfaces
18.4. Surface integrals
18.5. Gauss' theorem
18.6. Stokes' theorem

Midterm Exam 1 (Tuesday, April 6): Chapter 11, Chapter 12
Midterm Exam 2 (Thursday, May 13): Chapter 13 ~ 15
Final Exam (Thursday, June 17): Chapter 11 ~ Chapter 18