國立清華大學
微積分二 **Calculus (II)**

Math 1020-05 Spring 2008
Textbook: *Calculus* by Salas, Hille, Etgen (10th edition)
Instructor: Kuo-Chang Chen

Chapter 8. Polar Coordinates and Parametric Curves (1 week)
8.1. Polar coordinates
8.2. Area in polar coordinates
8.3. Parametric curves
8.4. Arc length and speed
8.5. Surfaces of revolution

Chapter 9. Infinite sequences (2 weeks)
9.1. Sequences of real numbers
9.2. Limit of a sequence
9.3. Some limit theorems
9.4. l'Hôpital's rule
9.5. Improper integrals

Chapter 10. Infinite series (3 weeks)
10.1. Series and convergence
10.2. The integral test and comparison tests
10.3. The ratio test and the root test
10.4. Absolute convergence and conditional convergence
10.5. Alternating series
10.6. Taylor polynomials and Taylor series
10.7. Power series

Chapter 11. Vectors in Three-Dimensional Space (1 week)
11.1. Three dimensional coordinate systems
11.2. Dot product of vectors
11.3. Cross product of vectors
11.4. Lines and planes
11.5. Quadratic surfaces

Chapter 12. Vector Functions (1.5 weeks)
12.1. Vector functions and space curves
12.2. Differentiation and integration of vector functions
12.3. Arc length and curvature
12.4. Some applications in mechanics

Chapter 13. Functions of Several Variables (2 weeks)
13.1. Level curves and level surfaces
13.2. Partial derivatives
13.3. Gradients and directional derivatives
13.4. The chain rule
13.5. Tangent lines and tangent planes
13.6. Maximum and minimum values

Chapter 14. Multiple Integrals (2 weeks)
14.1. Repeated integrals
14.2. Double integrals
14.3. Double integrals in polar coordinates
14.4. Triple integrals
14.5. Triple integrals in cylindrical and spherical coordinates
14.6. Change of variables in multiple integration

Chapter 15. Line Integrals and Surface Integrals (2.5 weeks)
15.1. Line integrals
15.2. Green's theorem
15.3. Parametric surfaces
15.4. Surface integrals
15.5. Gauss' theorem
15.6. Stokes' theorem

Midterm Exam 1 (Thursday, March 27): Chapter 8, Chapter 9, Sections 10.1－ 10.5
Midterm Exam 2 (Tuesday, May 13): Sections 10.6－ 10.7, Chapter 11－13
Final Exam (Tuesday, June 17): Chapter 8 ~ Chapter 15