

Outline (MATH101, Q4, 2005) (by Chi-Ming Leung)

Background

Chapter.Section	Hours	Topic
1.1	read	A Preview of Calculus
1.2	1	Finding Limits Graphically and Numerically
1.3	1	Evaluating Limits Analytically
1.4	1	Continuity and One-Sided Limits
2.4	1	The Chain Rule
2.5	1	Implicit Differentiation
4.5	1	Integration by Substitution
Total hours	6	

Integration Techniques, L'Hôpital's Rule, and Improper Integrals

Chapter.Section	Hours	Topic
8.1	1	Basic Integration Rules
8.2	2	Integration by Parts
8.3	2	Trigonometric Integrals
8.4	2	Trigonometric Substitution
8.5	2	Partial Fractions
8.6	read	Integration by Table and Other Integration Techniques
8.7	2	Indeterminate Forms and L'Hopital's Rule
8.8	2	Improper Integrals
Total hours	13	

Infinite Series

Chapter.Section	Hours	Topic
9.1	read	Sequences
9.2	1	Series and Convergence
9.3	1	The Integral Test and p -Series
9.4	1	Comparisons of Series
9.5	1	Alternating Series
9.6	1	The Ratio and Root Tests
9.7	1	Taylor Polynomials and Approximations
9.8	1	Power Series
9.9	2	Representation of Functions by Power Series
9.10	2	Taylor and Maclaurin Series
Total hours	11	

Conics, Parametric Equations, and Polar Coordinates

Chapter.Section	Hours	Topic
10.1	read	Conics and Calculus
10.2	2	Plane Curves and Parametric Equations
10.3	1	Parametric Equations and Calculus
10.4	2	Polar Coordinates and Polar Graphs
10.5	2	Area and Arc Length in Polar Coordinates
10.6	2	Polar Equations of Conics and Kepler's Law
Total hours	9	

Vectors and Geometry of Space

Chapter.Section	Hours	Topic
11.1	read	Vectors in the Plane
11.2	read	Space Coordinates and Vectors in Space
11.3	1	The Dot Product of Two Vectors
11.4	1	The Cross Product of Two Vectors in Space
11.5	1	Lines and Planes in Space
11.6	2	Surfaces in Space
11.7	1	Cylindrical and Spherical Coordinates
Total hours	6	

Vector-Valued Functions

Chapter.Section	Hours	Topic
12.1	1	Vector-Valued Functions
12.2	2	Differentiation and Integration of Vector-Valued Functions
12.3	1	Velocity and Acceleration
12.4	1	Tangent Vectors and Normal Vectors
Total hours	5	

Lecture	50 hours
Tests	4 hours
Tutorial	22 hours
Holiday	1 hour
Total	77 hours