

Syllabus for Math 166 (Spring 1998)

Chapter 6 Taylor Polynomials

- (1) Taylor Polynomials of a Function
- (2) Taylor Polynomial of Elementary Functions
- (3) Taylor Formula with Remainder
- (4) Estimation of the Remainder Term
- (5) Approximation of Functions
- (6) Rational, Algebraic and Transcendental Numbers
- (7) The Irrationality of e
- (8) Transcendency of e
- (9) L'Hopital's Rule

Chapter 7 Infinite Sequences and Infinite Series

- (1) Infinite Sequences
- (2) The Concept of Convergence and Divergence
- (3) Infinite Series
- (4) The Concept of Convergence and Divergence of Infinite Series
- (5) Examples (Harmonic Series, p -Series etc)
- (6) Telescoping Series and Geometric Series
- (7) Comparison Test
- (7) Limit Comparison Test
- (8) Integral Test
- (9) Ratio Test
- (10) Root Test
- (11) Alternating Series and Leibnitz's Theorem
- (12) Conditional and Absolute Convergence
- (13) Rearrangement of Series
- (14) Complex Numbers and Infinite Series of Complex Numbers

Chapter 8 Sequences and Series of Functions

- (1) Pointwise Convergence

- (2) Uniform Convergence (Weierstrauss M -Test)
- (3) Uniform Convergence and Continuity
- (4) Uniform Convergence and Integrability
- (5) Uniform Convergence and Differentiability (Counter Examples)
- (6) Taylor Series and Examples
- (7) Power Series and Radius of Convergence
- (8) Integrability and Differentiability of Power Series
- (9) Power Series and Differential Equations

Chapter 9 Vector Algebra

- (1) Vector Spaces
- (2) Dot Product
- (3) Norm
- (4) Projection and Orthogonality
- (5) Cauchy-Schwarz Inequality
- (6) Angles and the Law of Cosine
- (7) Linear Dependence and Independence
- (8) Basis
- (9) Vector Algebra
- (10) Lines and Planes
- (11) Determinant
- (12) Cross Product and Normals
- (13) Distances From a Point to a Line and a Plane
- (14) Cramer's Rule of Solving Simultaneous Equations