

Syllabus for Mathematics 9A.

Text: 11th edition of Thomas' Calculus by Finney, Weir and Giordano

REQUIRED LECTURES

Limits and Derivatives [4 lectures]

- 2.1 Rates of Change and Limits
- 2.2 Calculating Limits Using the Limit Laws
- 2.3 Precise Definition of a Limit
- 2.4 One-sided Limits and Limits at Infinity
- 2.5 Infinite Limits and Vertical Asymptotes
- 2.6 Continuity
- 2.7 Tangents and Derivatives

Differentiation [9 lectures]

- 3.1 The Derivative of a Function
- 3.2 Differentiation Rules
- 3.3 The Derivative as a Rate of Change
- 3.4 Derivatives of Trigonometric Functions
- 3.5 The Chain Rule and Parametric Equations
- 3.6 Implicit Differentiation
- 3.7 Related Rates
- 3.8 Linearization and Differentials

Applications of Derivatives [12 lectures]

- 4.1 Extreme Values of Functions
- 4.2 The Mean Value Theorem and Differential Equations
- 4.3 Monotonic Functions and the First Derivative Test
- 4.4 Concavity and Curve Sketching
- 4.5 Applied Optimization Problems
- 4.6 Indeterminate Forms and L'Hopitals's Rule
- 4.8 Antiderivatives

Additional lectures