Department of Mathematics
Johns Hopkins University

110.109 Calculus II (Phys. Sci. & Eng.)
Course Syllabus

The following list of topics is considered the core content for the course 110.109 Calculus II (Physical Sciences and Engineering). The current text for the course is:

Text: **Single Variable Calculus: Early Transcendentals,** *6th Edition*, James Stewart, ISBN-10: 0-495-01169-X ISBN-13: 978-0-495-01169-9

Course Topics

- **Techniques of Integration (1+ weeks)**
  - 7.1 Integration by Parts
  - 7.2 Trigonometric Integrals
  - 7.3 Trigonometric Substitution
  - 7.4 Integration of Rational Functions by Partial Fractions
- **Differential Equations (2- weeks)**
  - 9.1 Modeling with Differential Equations
  - 9.2 Direction Fields and Euler's Method
  - 9.3 Separable Equations
  - 9.5 Linear Equations
- **Parametric Equations and Polar Coordinates (2 weeks)**
  - 10.1 Curves Defined by Parametric Equations
  - 10.2 Calculus of parametric Curves
  - 10.3 Polar Coordinates
  - 10.4 Areas and Lengths in Polar Coordinates
- **Improper Integrals (1 week)**
  - 7.8 Improper Integrals
- **Sequences and Their Limits (1 week)**
  - 11.1 Sequences
- **Infinite Series and Convergence (2 weeks)**
  - 11.2 Series
  - 11.3 The Integral test and Estimates of Sums
  - 11.4 The Comparison Tests
  - 11.5 Alternating Series
- **Alternate Series, Power Series, Radius of Convergence (1 week)**
  - 11.6 Absolute Convergence and the Ratio and Root Tests
  - 11.8 Power Series
- **Calculus w/ Power Series, Taylor Series and Polynomials, Remainders (2 weeks)**
  - 11.9 Representing Function as Power Series
  - 11.10 Taylor and Maclauren Series
  - 11.12 Applications of Taylor Polynomials