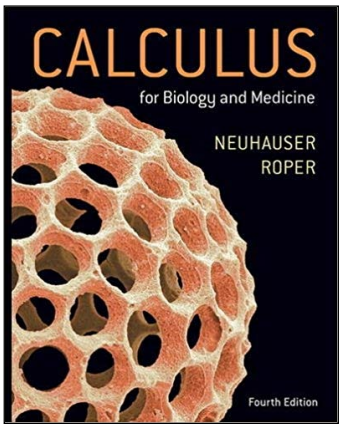
Department of Mathematics
Johns Hopkins University

AS.110.107 Calculus II (Bio. & Soc. Sci.) Course Syllabus

The following list of topics is considered the core content for the course 110.107 Calculus II (Biology and Social Sciences). The current text for the course is:

Text: **Calculus for Biology and Medicine,** *4th Edition*, C. Neuhauser and M. Roper, Boston: Pearson Ed., January 2018, ISBN-10: **0134070046**, ISBN-13: **978-0134070049.**

Course Topics



- **Preview and Review (1 week)**
  - Quick review of Syllabus from 110.106 Calculus I
  - 7.4 Improper Integrals
- **Differential Equations (1+ week)**
  - 8.1 Solving Separable Differential Equations
  - 8.2 Equilibria and their Stability
- **Linear Algebra and Geometry (3- weeks)**
  - 9.1 Linear Systems
  - 9.2 Matrices
  - 9.3 Linear Maps, Eigenvectors and Eigenvalues
  - 9.5 Analytic Geometry
- **Multivariable Calculus (4- weeks)**
  - 10.1 Functions of Two or More Independent Variables
  - 10.2 Limits and Continuity
  - 10.3 Partial Derivatives
  - 10.4 Tangent Planes, Differentiability, and Linearization
  - 10.5 The Chain Rule and Implicit Differentiation
  - 10.6 Directional Derivatives and Gradient Vectors
  - 10.7 Maximization and Minimization of Functions
- **Systems of Differential Equations (1 week)**
  - 11.1 Linear Systems Theory
  - 11.2 Linear Systems: Applications
- **Probability and Statistics (2+ weeks)**
  - 12.1 Counting
  - 12.2 What is Probability?
  - 12.3 Conditional Probability and Independence
  - 12.4 Discrete Random Variables and Discrete Distributions
  - 12.5 Continuous Distributions
  - 12.6 Limit Theorems
  - 12.7 (if time) Statistical Tools