



Catalog Description:

Ordinary and partial differential equations: Fourier series, boundary and initial value problems.

Prerequisite:

2153, 2162.xx, 2173, 2182H, 4182H, both (1172 or 1544 or 154) **and** 2568, 254.xx, 263.xx, 263.01H, or 264H.

Exclusions:

Not open to students with credit for Math 2255, 5520H, 2174, 255, 415.xx, or 521H.

Textbook:

Elementary Differential Equations and Boundary Value Problems, 10th Edition, by W. Boyce and R. DiPrima, ISBN 978-1-118-15738-1

-or- Lectures Notes, by Greg Baker, published by Zip Printing.

Topics List:

- 1.1 Some Basic Mathematical Models & Direction Fields
- 1.3 Classification of Differential Equations
- 1.2 Solutions to some Differential Equations
- 2.2 Separable Equations
- 2.1 Linear Equations with Variable Coefficients
- 2.3 Modeling with First Order Differential Equations
- 2.4 Difference between Linear and Nonlinear Equations
- 2.5 Autonomous Equations and Population Dynamics
- 3.1 Homogeneous Equations with Constant Coefficients;
- 3.3 Complex Roots of the Characteristic Equation
- 3.4 Repeated Roots

Midterm 1

- 3.2 Solutions of Linear Homogeneous Equations; the Wronskian
- 3.4 Reduction of Order
- 4.5 Non-homogeneous Equations; Method of Undetermined Coefficients
- 3.7 Mechanical and Electrical vibrations
- 3.9 Forced Vibrations
- 10.1 Two-point Boundary Value Problem

Midterm 2



- 10.2 Fourier Series
- 10.3 The Fourier Convergence Theorem
- 10.4 Even and Odd Functions
- 10.5 Separation of Variables; Heat Conduction in a Rod
- 10.7 Wave Equation: Vibrations of an Elastic String
- 7.1 Introduction
- 7.3 Systems of Linear Algebraic Equations; Linear Independence, Eigenvalues, Eigenvectors
- 7.5 Homogeneous Linear Systems with Constant Coefficients
- 7.6 Complex Eigenvalues
- 7.4 Basic Theory of Systems of 1st Order Linear Equations