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:

-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