MATH 325, FALL 2002, SYLLABUS

CHAPTER 4 **Higher Order Linear Equations** (3 Lectures)
  4.1 General Theory of n th Order Linear Equations
  4.2 Homogeneous Equations with constant Coefficients
  4.3 The Method of Undetermined Coefficients
  4.4 The Method of Variation of Parameters
CHAPTER 6 **The Laplace Transform** (7 Lectures, 1 Review)
  6.1 Definition of the Laplace Transform
  6.2 Solution of Initial Value Problems
  6.3 Step Functions
  6.4 Differential Equations with Discontinuous Forcing
       Functions
  6.5 Impulse Functions
  6.6 The Convolution Integral
CHAPTER 7 **Systems of First Order Linear Equations** (10 Lectures,
  1 Review)
  7.1 Introduction
  7.2 Review of Matrices
  7.3 Systems of Linear Algebraic Equations; Linear
       Independence, Eigenvalues, Eigenvectors
  7.4 Basic Theory of Systems of First Order Linear Equations
  7.5 Homogeneous Linear Systems with Constant Coefficients
  7.6 complex Eigenvalues
  7.7 Repeated Eigenvalues
  7.8 Fundamental Matrices
  7.9 Nonhomogeneous Linear Systems
CHAPTER 8 **Numerical Methods** (3 Lectures)
  8.1 The Euler or Tangent Line Method
  8.3 The Runge-Kutta Method
CHAPTER 9 **Nonlinear Differential Equations and Stability**
  (9 Lectures, 1 Review)
  9.1 The Phase Plane: Linear systems
  9.2 Autonomous systems and Stability
  9.3 Almost Linear systems
  9.5 Predator-Prey Equations
  9.6 Liapunov's Second Method
CHAPTER 10 **Partial Differential Equations and Fourier Series**
  (5 Lectures, 1 Review)
  10.1 Two-Point Boundary Value Problems
  10.2 Fourier Series
  10.3 The Fourier Convergence Theorem
  10.4 Even and Odd Functions
  10.5 Seperation of Variables, Heat Conduction Problems
  10.7 The Wave Equation: Vibrations of an Elastic String