

**MATH 325**  
**FALL 1995 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 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
- 9.6 Liapunov's Second Method

**CHAPTER 8 Numerical Methods**

- 8.1 The Euler or Tangent Line Method
- 8.2 Errors in Numerical Procedures
- 8.3 Improvements on the Euler Method

**CHAPTER 10 Partial Differential Equations and Fourier Series (4 Lectures, 1 Review)**

- 10.1 Separation of Variables; Heat Conduction
- 10.2 Fourier Series
- 10.3 The Fourier Theorem
- 10.4 Even and Odd Functions
- 10.5 Solution of Other Heat Conduction Problems
- 10.6 The Wave Equation: Vibrations of an Elastic String

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