

Math 225
Introduction to Differential Equations

Text Book: A FIRST COURSE IN DIFFERENTIAL EQUATIONS with Modeling Applications By
DENNIS G. ZILL (Tenth edition)

- **Chapter one (Introduction to Differential Equations):**

- 1.1 DEFINITIONS AND TERMINOLOGY
- 1.2 INITIAL-VALUE PROBLEMS

- **Chapter two (First-Order Differential Equations):**

- 2.2 SEPARABLE EQUATIONS
- 2.3 LINEAR EQUATIONS
- 2.4 Exact EQUATIONS
- 2.5 SOLUTIONS BY SUBSTITUTIONS

- **Orthogonal trajectories.**

- **Chapter four (Higher-Order Differential Equations):**

- 4.1 PRELIMINARY THEORY—LINEAR EQUATIONS
- 4.2 REDUCTION OF ORDER
- 4.3 HOMOGENEOUS LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS
- 4.4 UNDETERMINED COEFFICIENTS—SUPERPOSITION APPROACH
- 4.5 UNDETERMINED COEFFICIENTS —ANNIHILATOR APPROACH
- 4.6 VARIATION OF PARAMETERS
- 4.7 CAUCHY-EULER EQUATION
- 4.9 SOLVING SYSTEMS OF LINEAR DEs BY ELIMINATION

- **Chapter six (Series Solutions of Linear Equations):**

- 6.1 REVIEW OF POWER SERIES
- 6.2 SOLUTIONS ABOUT ORDINARY POINTS

- **Chapter Seven (The Laplace Transform):**

- 7.1 DEFINITION OF THE LAPLACE TRANSFORM
- 7.2 INVERSE TRANSFORMS AND TRANSFORMS OF DERIVATIVES
- 7.3 OPERATIONAL PROPERTIES