

MA 3253—Syllabus

Textbook: Differential Equations, 6th. Edition, Zill.

1. Introduction -- Chapter 1 -- (3 hours)

Order, Linear DE, Nonlinear DE, Initial Value Problems, Direction Fields, Picard's Existence & Uniqueness Theorem

2. First Order DEs -- Chapters 2 & 3 -- (8 hours)

Separable, Linear, Bernoulli, Homogeneous, Exact, Applications.

3. Higher Order DEs -- Chapters 4 & 5 ---(12 hours)

Linear Homogeneous Equations (Theory)

Linear Homogeneous Equations with Constant Coefficients

Linear Non- Homogeneous Equations (Theory)

Method of Undetermined Coefficients

Reduction of Order

Variation of Parameters

Cauchy - Euler Equations

Applications

4. Laplace Transforms --- Chapter 7 -- (10 hours)

Definition of LT, Inverse LT

Heaviside Function, Dirac Delta Function, Integrals and Periodic Functions

Systems of Linear Equations

Applications

5. One of the following topics -- Chapter 8 or Chapter 10 -- (6 hours)

(a) Systems of First Order Linear DEs (Matrix Method) & Applications (Ch.8)

(b) Phase Plane Analysis & Applications (Ch.10)