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ANDHRA UNIVERSITY  
DEPARTMENT OF MATHEMATICS  
B.A./M.Sc MATHEMATICS  
I SEMESTER  
M 104 DIFFERENTIAL EQUATIONS - I

Syllabus

UNIT I: Linear Differential equations of Higher Order: Preliminaries - Higher order linear differential equations - a modelling problem - Linear independence - equations with constant coefficients - equations with variable coefficients - Wronskian - variation of parameters - some standard methods - method of Laplace transforms.

Chapter 2 of prescribed text book.

UNIT II: Solutions of Differential equations in Power Series: Preliminaries - Second order linear equations with Ordinary points - Legendre equations with Legendre Polynomials - Second order equations with regular singular points - Properties of Bessel functions.

Chapter 3 of prescribed text book.

UNIT III: Systems of Linear Differential Equations: Preliminaries - Systems of First order equations - Model for arms competitions between two nations - Existence and uniqueness theorem - Fundamental matrix - Non homogeneous linear systems - Linear systems with constant coefficients - Linear systems with periodic coefficients.

Chapter 4 of prescribed text book.

UNIT IV: Existence and Uniqueness of solutions: Preliminaries - Successive approximations - Picard's theorem - Some examples - Continuation and dependence on initial conditions - Existence of solutions in the Large - Existence and Uniqueness of solutions of systems - Fixed point method.

Chapter 5 of prescribed text book.

Text book: S.G. Deo, V. Lakshmikantham and V Raghavendra: Text book of Ordinary Differential Equations, Second edition, Tata McGraw-Hill Publishing Company Limited, New Delhi, 1997.

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