

N.e.f. 2003 - 2004 AB
SX-S113 SYLLABUS
3-A

ANDHRA UNIVERSITY
DEPARTMENT OF MATHEMATICS
/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.