

**ACHARYA NAGARJUNA UNIVERSITY :: NAGARJUNANAGAR-522 510**

**First year B.Sc. Mathematics Syllabus of Paper-I**

**Semester-I**

**DIFFERENTIAL EQUATIONS**

**UNIT - 1: (12 hours). Differential equations of first order and first degree**

Linear differential equations; Differential equations reducible to linear form; Exact differential equations: Integrating factors; Change of variables; Simultaneous differential equations; Orthogonal Trajectories.

**UNIT-II : (12 hrs), Differential equations of the first order but not of the first degree:**

Equations solvable for  $p$ ; Equations solvable for  $y$ ; Equations solvable for  $x$ ; Equations that do not contain  $x$  (or  $y$ ); Equations of the first degree in  $x$  and  $y$  - Clairaut's Equation.

**UNIT-III: (12 hours) Higher order linear differential equations**

Solution of homogeneous linear differential equations of order  $n$  with constant coefficients; Solution of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators.

**UNIT -IV: (12 hours) Higher order linear differential equations**

Method of variation of parameters; Linear differential equations with non-constant coefficients; The Cauchy - Euler equation. System of Linear Differential Equations.

**UNIT - V: Partial Differential Equations-I**

Formation of partial differential equations - Equations of first order - Lagrange's Linear Equation - Charpit's method - Standard types of first order non-linear partial differential equations.

**Prescribed Text book:** Scope and treatment as in Differential Equations and Their Applications by Zafar Ahsan, published by Prentice-Hall of India Pvt. Ltd. New Delhi - Second edition: Sections 2.5 to 2.9, 3.1, 3.2, 4.2, 5.2 to 5.7, 7.3, 7.4.

**I.N.Sneddon:** An Introduction to partial differential equations (McGraw Hill-2000)

**Reference Book:**

1. V. Krishna Murthy & others "A text book of Mathematics for BA/BSc Vol. 1, S.Chand & Company, New Delhi
2. Rai Singhanian, "Ordinary and Partial Differential Equations", S. Chand & Company, New Delhi

**Reference Book:** P.K. Jain and Khaleel Ahmed, "A Text Book of Analytical Geometry of Three Dimensions", Wiley Eastern Ltd., 1999.

Differential Equations with applications and programs - S. Balachandra Rao & HR Anuradha-universities Press.

