

Andhra Pradesh State Council of Higher Education
CBCS B.A./B.Sc. **Mathematics** Course Structure
w.e.f. 2015-16 (Revised in April, 2016)

Year	Semester	Paper	Subject	Hrs.	Credits	IA	EA	Total	
1	I	I	Differential Equations & Differential Equations Problem Solving Sessions	6	5	25	75	100	
	II	II	Solid Geometry & Solid Geometry Problem Solving Sessions	6	5	25	75	100	
2	III	III	Abstract Algebra & Abstract Algebra Problem Solving Sessions	6	5	25	75	100	
	IV	IV	Real Analysis & Real Analysis Problem Solving Sessions	6	5	25	75	100	
3	V	V	Ring Theory & Vector Calculus & Ring Theory & Vector Calculus Problem Solving Sessions	5	5	25	75	100	
		VI	Linear Algebra & Linear Algebra Problem Solving Sessions	5	5	25	75	100	
	VI	VII	Electives: (any one) VII-(A) Laplace Transforms VII-(B) Numerical Analysis VII-(C) Number Theory & Elective Problem Solving Sessions	5	5	25	75	100	
		VIII		Cluster Electives: VIII-A-1: Integral Transforms	5	5	25	75	100
				VIII-A-2: Advanced Numerical Analysis	5	5	25	75	100
				VIII-A-3: <i>Project work</i> or VIII-B-1: Principles of Mechanics	5	5	25	75	100
VIII-B-2: Fluid Mechanics VIII-B-3: <i>Project work</i> or VIII-C-1: Graph Theory VIII-C-2: Applied Graph Theory VIII-C-3: <i>Project work</i>									

Andhra Pradesh State Council of Higher Education
w.e.f. 2015-16 (Revised in April, 2016)
B.A./B.Sc. FIRST YEAR MATHEMATICS SYLLABUS
SEMESTER –I, PAPER - 1
DIFFERENTIAL EQUATIONS

60 Hrs

UNIT – I (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.

UNIT – II (12 Hours), Orthogonal Trajectories.

Differential Equations of 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-I :

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.

General Solution of $f(D)y=0$

General Solution of $f(D)y=Q$ when Q is a function of x .

$\frac{1}{f(D)}$ is Expressed as partial fractions.

P.I. of $f(D)y = Q$ when $Q = be^{ax}$

P.I. of $f(D)y = Q$ when Q is $b \sin ax$ or $b \cos ax$.

UNIT – IV (12 Hours), Higher order linear differential equations-II :

Solution of the non-homogeneous linear differential equations with constant coefficients.

P.I. of $f(D)y = Q$ when $Q = bx^k$

P.I. of $f(D)y = Q$ when $Q = e^{ax} V$

P.I. of $f(D)y = Q$ when $Q = xV$

P.I. of $f(D)y = Q$ when $Q = x^m V$

UNIT – V (12 Hours), Higher order linear differential equations-III :

Method of variation of parameters; Linear differential Equations with non-constant coefficients; The Cauchy-Euler Equation.

Reference Books :

1. Differential Equations and Their Applications by Zafar Ahsan, published by Prentice-Hall of India Learning Pvt. Ltd. New Delhi-Second edition.
2. A text book of mathematics for BA/BSc Vol 1 by N. Krishna Murthy & others, published by S. Chand & Company, New Delhi.
3. Ordinary and Partial Differential Equations Raisinghanian, published by S. Chand & Company, New Delhi.
4. Differential Equations with applications and programs – S. Balachandra Rao & HR Anuradha-universities press.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Application of Differential Equations in Real life