B.A/ B.Sc	Semester-I	Credits:4
Course:1	DIFFERENTIAL EQUATIONS	Hrs/Weak:5

Course Outcomes:

After successful completion of this course, the student will be able to;

- Solve linear differential equations
- Convert non exact homogeneous equations to exact differential equations by using integrating factors
- Know the methods of finding solutions of differential equations of the first order but not of the firstDegree.
- Solve higher-order linear differential equations, both homogeneous and non homogeneous, withconstant coefficients.
- Understand the concept and apply appropriate methods for solving differential equations.

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.

UNIT II:(12 Hours)

Differential Equations of first order but not of the first degree:

Equations solvable for p; Equations solvable for y; Equations solvable for x; Equations homogeneous in x and 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 1/f(D) is expressed as partial fractions of x,

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

P.I. of f(D)y = Q when Q is bsin 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 **,** where V is a function of x.

P.I. of f(D)y = Q when Q= xV **,** where V is a function of x.

P.I. of f(D)y = Q when Q= x^mV **,** where V is a function of x.

UNIT V:(12 Hours)

Higher order linear differential equations-III :

Method of variation of parameters; Linear differential Equations with non-constant coefficients(Solution whena part of CF is known method only); The Cauchy-Euler Equation, Legendre's linear equations.

Co-Curricular Activities(15 Hours)

Seminar/ Quiz/ Assignments/ Applications of Differential Equations to Real life Problem /Problem Solving.

TEXT BOOK :

1. Differential Equations and Their Applications by Zafar Ahsan, published by Prentice-Hall ofIndia Pvt. Ltd, New Delhi-Second edition.

REFERENCE BOOKS :

1. A text book of Mathematics for B.A/B.Sc, Vol 1, by N. Krishna Murthy & others, published byS.Chand & Company, New Delhi.
2. Ordinary and Partial Differential Equations by Dr. M.D,Raisinghania, published by S. Chand &Company, New Delhi.
3. Differential Equations with applications and programs – S. Balachandra Rao & HR AnuradhaUniversities Press.
4. Differential Equations -Srinivas Vangala & Madhu Rajesh, published by Spectrum UniversityPress.