COURSE-I

CBCS/ SEMESTER SYSTEM

B.A./B.Sc. MATHEMATICS (w.e.f. 2020-21 Admitted Batch)

DIFFERENTIAL EQUATIONS

SYLLABUS (75 Hours)

Course Outcomes:

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

1.Solve linear differential equations

2.Convertnonexact homogeneous equations to exact differential equations by using integrating

factors.

3.Know the methods of finding solutions ofdifferential equations of the firstorder but not of the

firstdegree.

4.Solvehigher-order linear differential equations, both homogeneous and non homogeneous, with

constant coefficients.

5. Understand the concept and apply appropriate methods for solving differential equations.

Course Syllabus:

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 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 of x,

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is expressed as partial fractions.

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

P.I. of f(D)y = Q when Q is bsinax 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=

k

bx

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

ax e 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=

m

x V , 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; The

Cauchy-Euler Equation, Legendre's linear equations, miscellaneous differential equations.

Co-Curricular Activities(15 Hours)

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

Solving

bx

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 $Q =$

m

$x^m V$, 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; The

Cauchy-Euler Equation, Legendre's linear equations, miscellaneous differential equations.

Co-Curricular Activities(15 Hours)

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Solving