St.Joseph's College For Women (Autonomous) , Visakhapatnam

I SEMESTER **MATHEMATICS** **TIME: 5 Hrs/Week**

M 1301 (4) **DIFFERENTIAL EQUATIONS** **Max. Marks : 100**

w.e.f 2016-2017

SYLLABUS

OBJECTIVES: To enable the students to

1. Learn the definitions and methods
2. Understand the problems, theorems and identities
3. Apply the principles in Engineering, Physics and other Applied Sciences

UNIT 1: Differential Equations of First Order and First Degree:

Introduction, Exact differential equations, equations reducible to exact form-methods1,2,3,4,5, Linear differential equations,differential equation reducible to linar form(Bernoulli's equations), change of variables, simultaneous differential equations

UNIT 2: Orthogonal Trajectories:

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

Equations solvable $for\ p, Equations$ solvable for y, Equations solvable for x, Equations do not contain x or y, Clairauts equations.

UNIT 3: Higher Order Linear Differential Equations with Constant Coefficients

Solutions of homogeneous linear differential equations of order 'n' with constant coefficients, solutions of non-homogeneous linear differential equations with constant coefficients by means of polynomial operators.

(i) Q(x) = be^{ax}

(ii) Q(x) = $bsinax$ (or) $bcosax$

(iii) Q(x) = b x^k

(iv) Q(x) = e^{ax}.v where v is a function of x

(v) Q(x) = x.v where v is a function of x

UNIT 4 :

(A) Higher Order Linear Differential Equations With Non-Constant Coefficients:

1. Change of the dependent variable, when part of the C.F is known.
2. Method of variation of parameters
3. Cauchy-Euler equations
4. Legender's equations

(B) System Of Linear Differential Equations

UNIT 5: Partial Differential Equations:

Formation of partial differential equations, equations of first order, lagrange's linear equations, charpit's method, standard types of first order non-linear partial diferential equations.

Prescribed text books:

A Text book of B.Sc Mathematics -Vol-I-by S.Chand Publications - 2016 Edition

Reference Books:

1. A Text book of Mathematics – Vol I – Vashishta & Vashishta (1998)
2. Diferential Equations - J.N.Sharma, Dr.R.K.Gupta-Krishna Prakash Media Pvt Ltd (1996)
3. Differential Equations - M.L.Khanna- Jai Prakash& Co(1954)

St. Joseph's College For Women (Autonomous) , Visakhapatnam

I SEMESTER **MATHEMATICS** **TIME: 1 Hr/Week**

M 1351 (1) **DIFFERENTIAL EQUATIONS** **Max. Marks: 50**

w.e.f 2016-2017

PRACTICAL SYLLABUS

OBJECTIVES: To enable the students to

1. Learn the definitions and methods
2. Understand the problems, theorems and identities
3. Apply the principles in Engineering, Physics and other Applied Sciences

UNIT 1:

Differential Equations of First Order and First Degree:

UNIT 2:

Orthogonal Trajectories:

UNIT 3:

Higher Order Linear Differential Equations with Constant Coefficients)

UNIT 4 :

(A) Higher Order Linear Differential Equations With Non-Constant Coefficients:

(B) System Of Linear Differential Equations

UNIT 5:

Partial Differential Equations:

Prescribed text books:

A Text book of B.Sc Mathematics -Vol-I-by S.Chand Publications - 2016 Edition

Reference Books:

1. A Text book of Mathematics – Vol I – Vashishta & Vashishta(1998)
2. Diferential Equations - J.N.Sharma, Dr.R.K.Gupta-Krishna Prakash Media Pvt Ltd (1996)
3. Differential Equations - M.L.Khanna- Jai Prakash& Co(1954)