KVR GOVT. COLLEGE FOR WOMEN (AUTONOMOUS), KURNOOL
Re-Accredited by NAAC with Grade "A"
CHOICE BASED CREDIT SYSTEM (w.e.f. 2016-17)
FIRST YEAR B.Sc. MATHEMATICS
FIRST SEMESTER, CORE COURSE-I
CORE COURSE-I: DIFFERENTIAL EQUATIONS(w. e. f. 2021-2022)

Course Syllabus(75 hours):

UNIT – I (12 Hours)

Differential Equations of first order and first degree:

Linear Differential Equations; Differential equations reducible to linear form; Exact differential equations; Equations reducible to exact form ; Integrating factors; Change of variables.

Equations reducible to first order and first degree by $p = \frac{dy}{dx}$ substitution.

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, $\frac{\mathbf{1}}{\boldsymbol{f(D)}}$ 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 bsinax or bcos 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; The Cauchy-Euler Equation, Legendre's linear equations, System of two linear differential equations with constant coefficients

Co-Curricular Activities(15 Hours)

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

Text Book :

1. A text book of B.Sc.Mathematics, Volume-I (Theory and Practical), by V.Venkateswara Rao,N. Krishna Murthy & others, published by S.Chand & Company, New Delhi.

Reference Books :

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

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 Anuradha-Universities Press.

4. Differential Equations -Srinivas Vangala & Madhu Rajesh, published by Spectrum University Press.

ANNEXURE - II
KVR GOVT. COLLEGE FOR WOMEN (AUTONOMOUS), KURNOOL
Re-Accredited by NAAC with Grade "A"
CHOICE BASED CREDIT SYSTEM (w.e.f. 2016-17)
FIRST YEAR B.Sc. MATHEMATICS
SECOND SEMESTER ,CORE COURSE-II
THREE DIMENSIONAL ANALYTICAL SOLID GEOMETRY(w. e. f. 2021-2022)

Course Syllabus(75 Hours):

UNIT – I (12 Hours)
The Plane :
Equation of plane in terms of its intercepts on the axis, Equations of the plane through the given points, Length of the perpendicular from a given point to a given plane, Bisectors of angles between two planes, Combined equation of two planes, Orthogonal projection on a plane.

UNIT – II (12 hrs)
The Line :
Equation of a line; Angle between a line and a plane; The condition that a given line may lie in a given plane; The condition that two given lines are coplanar; Number of arbitrary constants in the equations of straight line; Sets of conditions which determine a line; The shortest distance between two lines; The length and equations of the line of shortest distance between two straight lines; Length of the perpendicular from a given point to a given line.

UNIT – III (12 hrs)
The Sphere:
Definition and equation of the sphere; Equation of the sphere through four given points; Plane sections of a sphere; Intersection of two spheres; Equation of a circle; Sphere through a given circle;Intersection of a sphere and a line; Power of a point; Tangent plane

UNIT – IV (12 hrs)
The Sphere and Cones:
Angle of intersection of two spheres; Conditions for two spheres to be orthogonal; Radical plane; Coaxal system of spheres; Simplified from of the equation of two spheres.
Definitions of a cone; vertex; guiding curve; generators; Equation of the cone with a given vertex and guiding curve; equations of cones with vertex at origin are homogenous; Condition that the general equation of the second degree should represent a cone;

UNIT – V (12 hrs)
Cones and Cylinder:
Enveloping cone of a sphere; right circular cone: equation of the right circular cone with a given vertex, axis and semi vertical angle: Condition that a cone may have three mutually perpendicular generators; intersection of a line and a quadric cone; Tangent lines and tangent plane at a point; Condition that a plane may touch a cone; Reciprocal cones;
Cylinder: Equation of a Cylinder whose generators are parallel to a given line and a base curve.

Co-Curricular Activities(15 Hours)
Seminar/ Quiz/ Assignments/Three dimensional analytical Solid geometry and its applications/ Problem Solving.

Text Book : A text book of Mathematics for BA/B.ScVol 1, by V Krishna Murthy & Others, published by S. Chand & Company, New Delhi.

Reference Books : 1. Analytical Solid Geometry by Shanti Narayan and P.K. Mittal, published by S. Chand & Company Ltd. 7th Edition.

2. A text Book of Analytical Geometry of Three Dimensions, by P.K. Jain and Khaleel Ahmed, published by Wiley Eastern Ltd., 1999.

3. Co-ordinate Geometry of two and three dimensions by P. Balasubrahmanyam, K.Y. Subrahmanyam, G.R. Venkataraman published by Tata-MC Gran-Hill Publishers Company Ltd., New Delhi.

4. Solid Geometry by B.RamaBhupal Reddy, published by Spectrum University Press.