Semester-2

MAM121T: Co-ordinate Geometry and Differential Equations

Semester: II	Course Title: Co-ordinate Geometry and Differential Equations	Credit: 4
Course No.: 121T	Major-3 (T)	Hours: 4/week

COs with Cognitive Abilities

COs	COGNITIVE ABILITIES	COURSE OUTCOMES
CO1	REMEMBERING	Describe various coordinate system in R^2 and R^3
CO2	UNDERSTANDING	Discuss geometrical concepts of various well-known surfaces.
CO3	APPLYING	Demonstrate to formulate and solve differential equations.
CO4	ANALYSING	Question on initial and boundary value problems.
CO5	EVALUATING	Evaluate first and higher order of differential equations

CO-PO-Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	1	2	1		
CO 2	1	1	1		
CO 3	1	2	1		
CO 4		1	2		
CO 5	1	1	2		

Unit	Detailed Syllabus	No. of Hours of Teaching
I	**various coordinate system in R^2 and R^3 and Cone and cylinder in R^3:** **(a)** Polar coordinates in R^2& R^3 and its Relationships with Cartesian coordinates, polar equation of line-/circle /conic and properties of conics. Mutual relationship between Spherical, Cylindrical and Cartesian coordinates. **(b)** Introduction to different types of cone and cylinder, Equations of enveloping cone and cylinder. Right circular cone/cylinder. Problems on cone and cylinder.	15

II	**Sphere and Introduction to conicoid:** **(a)** Definition of a sphere in R^3, Cartesian equation of a sphere, General equation of a sphere, Equation of a sphere with diametrically opposite end points, Intersection of a sphere with Line/plane/sphere(problems), Equation of a tangent plane to a sphere. The tangency of a plane and normality of a line to a sphere, Orthogonal spheres. **(b)** Conicoids: Introduction to conicoid, types of central and non-central conicoid in R^3, figures of conicoid	15
III	**Methods of solving Differential Equations of first order and first degree:** Variable separable, Homogeneous, and non-homogeneous differential equations, Exact differential equations **(without proof)**, Integrating factors, Linear differential equation of first order and first degree, Bernoulli's differential equation & Differential Equations reducible to them.	15
IV	**Method of solving differential equations of first order and higher degree:** Differential equations solvable for y, solvable for x, solvable for p (where$p = dy / dx$), Clairaut's differential equation (both general and singular), Lagrange's differential equation.	15

Suggested Reference Books:

1. Calculus - JAMES STEWART , THOMSONBROOKS/COLE
2. Calculus -T.M.Apostol
3. Calculus - Thomas and Finney , Pearson Education , Asianedition
4. Calculus - Dr. Elliot Mendel son, Mc GrawHill Bookco.
5. A first course in calculus fifth edition By Serge Lang , SpringerIndia
6. Ordinary and Partial Differential Equations Theory and Applications,By:Nita H. Shah,PHI
7. Introductory course in Differentialequations-Murray
8. Differential equations and their applications, Prentice Hall of India- Zafar Ahsan(1999)
9. Elementary Differential equations–Kella
10. Co-ordinate Geometry By : R.J.T.Bell
11. Solid Geometry(three dimension) – H. K. Das ,S. C. Saxena and Raisinghania , S.Chand