Semester-II (Minor)
Coordinate Geometry (Theory and Practical)
Course Code: MT-2101
No. of Credits: 04(2+2)
Learning Hours: 6 Hours/Week

Part-I: Theory(credits -2, 2 hrs/week)

Unit 1: Sphere: Definition of a sphere in R^3, Cartesian equation of a sphere, general equation of a sphere, equation of a sphere with diametrical end points, intersection of a sphere with line/ plane/ sphere (no theory and only problems), equation of a tangent plane and normal line to a sphere. The condition for tangency of a plane and normality of a line to a sphere, plane of contact, orthogonal spheres.

Unit 2: (a) Different Coordinate systems: Polar coordinates in R^2 and its relationships with Cartesian coordinates, polar equation of line/ circle/ conic and properties of conic. Spherical, cylindrical coordinates in R^3 and its relationship with Cartesian coordinates in R^3.
(b) Cone & Cylinder: Introduction to of cone and cylinder, Cone and Cylinder generated by a guiding curve, equation of enveloping cone and cylinder, right circular cone and right circular cylinder, Problems on cone and cylinder.

Reference Books:

1   Analytical Solid Geometry- Shanti Narayan
2   Co-ordinate Geometry By : R.J.T. Bell.
3   Solid Geometry(three dimension) – H. K. Das ,S. C. Saxena and Raisinghania , S. Chand
4   Coordinate Geometry, Polar Coordinate approach, M M Tripathi, Alpha Science International

Part-II: Practical (credits -2 , 4 hrs/week)

List of practical to be performed:
   (1) Problems on line in R^3
   (2) Problems on plane in R^3.
   (3) Problems on various coordinate systems in R^2 and R^3(polar, cylindrical, spherical)
   (4) Problems based on polar equation of line in R^2.
   (5) Problems based on polar equation of circle in R^2.
   (6) Problems on polar equations of conic in R^2.
   (7) Sphere-I.
   (8) Sphere-II.
   (9) Problems on cone generated by base curve and enveloping cone.
   (10) Problems on right circular cone.
   (11) Problems on cylinder generated by base curve and enveloping cylinder.
   (12) Problems on right circular cylinder.
   (13) Introduction to conicoids in R^3(types of conicoids, its properties and diagram)
   (14) Project on curves/surfaces.

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