UNIT I
Rectangular Cartesian of a point in space. Distance between two points. Cylindrical coordinates, Spherical Coordinates, direction cosines, point of division, orthogonal projections, angle between straight. Examples and exercise. Shortest distance between the straight line, line of greatest slope, Conditions for line intersection. Orthogonal projection of a plane area. Area of triangle in space, volume of triangle in space. Examples and Exercise.

UNIT II
Sphere circle and related topics, Tangent lines and tangent planes to a sphere, radial plane, radial line, coaxial spheres, limiting points. Examples and exercises. Surface and conicoid: transformation of axes, Invariant and decrementing Cube, centre, tangent planes, normal lines, principle directions, Diometrical and principle planes. Examples and exercises.

UNIT III
Conicoid polar planes, Locus of chords, Pole with respect to conicoid. Examples and Exercises. Parabolic, definition and description, Elliptical and Hyperbolic parabolic, Parabolic of revolution, Tangent planes and normal to a parabolic, Diometrical and Conjugate planes, Examples and exercises.

UNIT IV
The Ellipsoid, normal plane to it, director sphere of an ellipsoid, normal line to ellipsoid, diametrical plane to ellipsoid, conjugate diameters and diametrical planes to ellipsoid, locus of chords, polar planes. Examples and exercises.

UNIT V
The definition and description, finding equation of cone, standard equation, condition of general Quadratic equation representing cone, Angle between two generators, enveloping cone of coincoinds, right circular cone. Examples and exercises. The Cylinder definition, equation, right circular cylinder, enveloping cylinder to a coincooid. Examples and exercises.

TEXT BOOK
Coordinate Geometry of three Dimensions by G. Paria, Scholakr Publishing House, Indore

REFERENCE BOOKS
3. Engineering Mathematics Volume 3: R Kandasamy and others (S. Chand and Co.)
5. Fundamentals of mathematical statistics: S. C. Gupta and V. K. Kapoor (Sultan Chand and sons)