



Math 2004	ANALYTICAL GEOMETRY	(CR3)
Preq.	Math 1001, 1002	

Objectives

To give students an introduction to the use of calculus in geometry.

Syllabus

Curves in the Cartesian plane, parametric representations, the roulettes, polar coordinates, tangents and normal, conic sections properties of parabola, ellipse and hyperbola, polar equations of conic, change of axes, the general equation of the second degree, extreme values of a function, concavity and convexity, singular points, investigation of singular points by second partial derivatives, asymptotes, curve tracing, Arc lengths, intrinsic equations, curvature, circle of curvature, involutes and evolutes, properties of evolute, areas in rectangular and polar coordinates, analytical geometry of three dimensions, rectangular, spherical polar and cylindrical polar coordinates, direction cosines, direction components, projections, angle between two lines, perpendicular lines, equations of a plane in various forms, perpendicular line to a plane, parallel planes, perpendicular planes, equations of straight line in various forms, point slope, plane through a line, perpendicularity and parallelism of lines and planes, equation of locus, shortest distance between two lines, examples of surfaces, intercepts, traces, symmetry, sketching by parallel plane sections, surfaces of revolution, quadric surfaces, spheres, ellipsoids, paraboloids, hyperboloids, cylinders, cones, curves in space, ruled surfaces, volumes of solids revolution, area of surfaces of revolution.

Recommended Books

1. *Calculus by Thomas (11th Edition), Addison Wesley (2005)*
2. *Calculus by H. Anton, I. Bevens, S. Davis (8th Edition), John-Wiley (2005)*
3. *Calculus Single and Multivariable by D. H. Hallett, A. M. Gleason, W. G. McCallum (3rd Edition) John Wiley (2002)*
4. *Calculus and Analytics Geometry by C. H. Edward and E.D Penney, Prentice Hall (1988)*