Code	Subject Title	Cr. Hrs	Semester
MATH-103	Mathematics A-II [Plane Curves & Analytic Geometry]	4	II
Year	Discipline		
1	Mathematics-I,II, Chemistry-II, Statistics-I,II,III		

Plane Analytics Geometry
- Conic section and quadratic equations
- Classifying conic section by eccentricity
- Translation and rotation of axis
- Properties of circle, parabola, ellipse, hyperbola
- Polar coordinates, conic sections in polar coordinates
- Graphing in polar coordinates
- Tangents and normal, pedal equations, parametric representations of curves

Applications of Integration
- Asymptotes.
- Relative extrema, points of inflection and concavity
- Singular, points, tangents at the origin
- Graphing of Cartesian and polar curves
- Area under the curve, area between two curves
- Arc length and intrinsic equations
- Curvature, radius and centre of curvature
- Involute and evolute, envelope

Analytic Geometry of Three Dimensions
- Rectangular coordinates system in a space
- Cylindrical and spherical coordinate system
- Direction ratios and direction cosines of a line
- Equation of straight lines and planes in three dimensions
- Shortest distance between skew lines
- Equation of sphere, cylinder, cone, ellipsoids, paraboloids, hyperboloids
- Quadric and ruled surfaces
- Spherical trigonometry. Direction of Qibla

Recommended Books
1. Thomas, *Calculus*, 11th Edition. Addison Wesley publishing company, 2005
2. H. Anton, I. Bevens, S. Davis, *Calculus*, 8th Edition, John Wiley & Sons, Inc. 2005
3. Hughes-Hallett, Gleason, McCallum, et al, *Calculus Single and Multivariable*, 3rd Edition. John Wiley & Sons, Inc. 2002.
4. Frank A. Jr, Elliott Mendelson, *Calculus*, Schaum's outlines series, 4th edition, 1999
5. C.H. Edward and E.D Penney, *Calculus and Analytics Geometry* Prentice Hall, Inc. 1988
6. E. W. Swokowski, *Calculus and Analytic Grometry* PWS Publishers, Boston, Massachosetts, 1983.
7. Dennis G. Zill & Patric D. Shanahan, *Complex Analysis*, Jones & Barlett Publishers, 2003