

Mathematics Curriculum for Semester - I

I	Course Code	MA 181001			
II	Course Title	Mathematics I : Calculus			
III	Credit Structure	L	T	P	C
		3	2	0	5
IV	Course Content	<ol style="list-style-type: none"> 1. Limit, Continuity, Limit at infinity, infinite limits, asymptotes, limit of sequences, Continuity and differentiability, IVT 2. Linear Approximation and differentials, Maximum and Minimum Values, The Mean Value Theorems, Increasing and decreasing functions, concavity and curve sketching ,Indeterminate Forms and L'Hospital's Rule, Taylor's theorem 3. Area, Riemann sums, the definite integral, the fundamental theorem of calculus 4. Application of Definite integrals-Areas between Curves, Volumes 5. Volumes by Cylindrical Shells, Work, Average Value of a Function, Arc Length, Area of a Surface of Revolution, Improper Integrals. 6. Three-Dimensional Coordinate Systems, Equations of Lines and Planes, Cylinders and Quadric Surfaces, Cylindrical Coordinates, Spherical Coordinates 7. Functions of Several Variables, Limits and Continuity, Partial Derivatives, Tangent Planes and Linear Approximations, The Chain Rule, Directional Derivatives and the Gradient Vector 8. Vector functions, Vector Functions and Space Curves, Derivatives and Integrals of Vector Functions, Arc Length and Curvature, Motion in Space: Velocity and Acceleration 9. Vector fields, Gradient, Curl and Divergence 10. Extreme values and saddle points of functions of several variables, Constrained optimization, Lagrange Multiplier Method. 			
V	Text/References	<ol style="list-style-type: none"> 1. Thomas, G.B., and Finney, R.L., Calculus and Analytic Geometry, 9th Edition, ISE Reprint, Addison-Wesley, 1998. 2. Stewart, J., Calculus, 5th Edition, Thomson, 2003. 3. Marsden, J.E., Tromba, A.J., and Weinstein, A., Basic multivariable calculus, Springer India, 2004. 4. Apostol, T.M., Calculus, Volumes 1 and 2, 2nd Edition, Wiley Eastern, 1980. 5. Hughes-Hallett et al, Calculus - Single and Multivariable (3rd Edition), John- Wiley and Sons 2003 			