

SARDAR PATEL UNIVERSITY , VALLABH VIDYANAGAR  
SYLLABUS FOR B.Sc. SEMESTER - 1  
US01CMTH21(T) (CALCULUS)  
FOUR HOURS PER WEEK (4 CREDIT)  
Effective from June 2018  
Marks:-100 (30 Internal + 70 External)

**Unit-1**

Hyperbolic Functions , Successive Derivative , Higher Order Derivatives ,  $n^{\text{th}}$  Derivatives of Standard Form , Leibnitz's Theorem and its Applications , L'Hospital Rule ,Technics of Sketching Conics,Reflection Properties of Conics,Rotation of Axes and Second Degree Equations,Classification into Conics using Discriminant .

**Unit-2**

Curve Tracing in Cartesian coordinates , Parametric Equations , Tracing of Parametric Curves , Polar coordinates, Curve Tracing in Polar coordinates , Polar Equation of Conics .

**Unit-3**

Reduction Formulae for Integration of  $\sin^n x$ ,  $\cos^n x$ ,  $\sin^n x \cos^m x$ ,  $\tan^n x$ ,  $\cot^n x$ ,  $\sec^n x$ ,  $\operatorname{cosec}^n x$  ,

Volumes by Slicing , Disks and Washers Methods , Volumes by Cylindrical Shells. Arc length, Arc length of Parametric Curves and Polar Curves , Derivation of Intrinsic Equations of a Curve , Area of Surface of Revolution .

**Unit-4**

Curvature, Radius of Curvature for Cartesian, Parametric and Polar Equations, Length of Arc as a Function .

Limit and Continuity of a Functions of Two Variables, Neighbourhood of a Point, Partial Derivatives, Euler's Theorem on Homogeneous Functions of Two and Three Variables, Theorem on Total Differentials, Differentiation of Composite and Implicit Functions.

Introduction to Vector Functions , Limits and Continuity of Vector Functions , Differentiation and Integration of Vector Functions.

**Recommended Texts :**

- (1) Shanti Narayan, Differential Calculus, 14th Edition, S.Chand & Company Ltd., New Delhi, 1996  
Chapter : 5 , 6(6.6 Only) , 9 , 10 , 12(12.1,12.2,12.3 Only)
- (2) Shanti Narayan, Integral Calculus, 14th Edition, S.Chand & Company Ltd., New Delhi, 1996  
Chapter : 4 (Except 4.7,4.8,4.9) , 8(Except 8.5)
- (3) Maurice D.Weir, Joel Hass, Frank R.Giordano , Thomas' Calculus , Pearson Education, Delhi.  
Chapter : 6 (Only 6.1,6.2,6.5), 10(Only 10.1,10.2,10.3), 13 (Only 13.1)
- (4) H.M.Vasavada , Analytical Geometry of Two and Three Dimensions , 1992  
Chapter : 2 (Only 11,12,13), 3 , 4 (1 to 5)

(2)

*Chaitanya B05*  
*1/12/18*

### Reference Texts:

- (1) Louis Leithod, The Calculus with Analytic Geometry, Harper-Collins Pub.
- (2) G.B.Thomas and R.L.Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005.
- (3) M.J.Strauss, G.L.Bradley and K.J.Smith, Calculus, 3rd Ed., John Wiley and Sons(Asia)P.Ltd., Singapore, 2002.
- (4) H.Anton, I.Bivens, S.Devis, Calculus, 7th Ed., John Wiley and sons (Asia) Pt.Ltd., Singapore, 2002.
- (5) D J Karia, N Y Patel, B P Patel, M L Patel, Introduction to Calculus and Differential Equations, Roopal Prakasan, Vallabh Vidyanagar.
- (6) S.K.Patel, B.P.Patel, H.R.Kataria, B.L.Ghodadra, Calculus and Matrix Algebra, University Granthnirman board, Ahmedabad-6
- (7) B.S.Grewal, Higher Engineering Mathematics, Thirty-fifth edition, Khanna Publ.
- (8) H.M.Vasavada, Analytical Geometry of Two and Three Dimensions, 1992