Part A: Introduction				
Program: Certificate Course		Class: B.Sc. Sem. I	Year: 2023	Session:2023-2024
1	Course Code	MSC-1		
2	Course Title	Calculus		
3	Course Type	Theory		
4	Course Learning Outcome (CLO)	**This Course will enable the students to:** • Calculate the limit and examine the continuity and understand the geometrical interpretation of differentiability. Apply various tests to determine convergence. • Understand the consequences of various mean value theorems. • Draw curves in Cartesian and polar coordinate systems. • Understand conceptual variations while advancing from one variable to severalvariables in calculus. • Understand the integration of transcendental function and use of integration in Quadrature, rectification, volume and surfaces of solid of revolution .		
5	Credit Value	**Theory & Tutorial: 4**		
6	Total Marks	Maximum Marks : 100 (Ext. 80 + Int. 20)		Minimum Passing Marks:40

Part B: Content of the Course		
Module	**Topics**	**No. of Hours**
I	**Sequences, Continuity and Differentiability** : Notion of convergence of sequences and series of real numbers, ε-δ definition of limit and continuity of a real valued function; Sequential continuity, properties of continuous function on closed interval [a b], uniform continuity .Differentiability and its geometrical interpretation.	15
II	**Expansion of Functions:** Rolle's Theorem, Lagrange's mean value theorem, Cauchy's mean value theorem and their geometrical interpretations, Darboux's theorem, Chain rule of differentiation. Successive differentiation and Leibnitz theorem, Maclaurin's and Taylor's theorems for expansion of a function, Taylor's theorem in finite form with Lagrange, Cauchy and Roche–Schlömilch forms of remainder.	15
III	**Curvature, Asymptotes , Curve Tracing:** Curvature; Asymptotes of general algebraic curves, Parallel asymptotes, Asymptotes parallel to axes; Symmetry, Concavity and convexity, Points of inflection, Tangents at origin, Multiple points, Position and nature of double points; Tracing of Cartesian, polar and parametric curves.	15
IV	**Integration and Its applications:** Integration of transcendental function. Reduction formulae. Definite integrals. Quadrature , Rectification, volume and surfaces of solids of revolution.	15

Part C - Learning Resource		
Text Books, Reference Books, Other Resources		
1. Howard Anton, I. Bivens & Stephan Davis (2016). Calculus (10th edition). Wiley India. 2. Gabriel Klambauer (1986). Aspects of Calculus. Springer-Verlag. 3. Wieslaw Krawcewicz & Bindhyachal Rai (2003). Calculus with Maple Labs. Narosa. 4. Gorakh Prasad (2016). Differential Calculus (19th edition). Pothishala Pvt. Ltd. 5. George B. Thomas Jr., Joel Hass, Christopher Heil & Maurice D. Weir (2018). Thomas' Calculus (14th edition). Pearson Education. 6. Jerrold Marsden, Anthony J. Tromba & Alan Weinstein (2009). Basic Multivariable Calculus, Springer India Pvt. Limited. 7. James Stewart (2012). Multivariable Calculus (7th edition). Brooks/Cole. Cengage. 8. Monty J. Strauss, Gerald L. Bradley & Karl J. Smith (2011). Calculus (3rd edition). Pearson Education. Dorling Kindersley (India) Pvt. Ltd. 9. Suggested Equivalent **online courses:** Web link NPTEL/ SWAYAM/ MOOCs		
Part D: **Assessment and Evaluation**		
Suggested Continuous Evaluation Methods: **Maximum Marks:** **100 Marks** **Continuous Comprehensive Evaluation (CCE):** **20 Marks** **Semester End Exam (SEE):** **80 Marks**		
Internal Assessment: Continuous Comprehensive Evaluation(CCE)	Internal Test -02 of 10 Marks each Assignment/Seminar-01 0f 10 Marks	Sum of best of two test and assignment marks
Semester End Exam (SEE)	Paper-**Two Section**-A&B Section-A: Objective and short answer type question-1x10+3x10= 40 Marks Section-B: Descriptive answer type question Module wise- 10x4 =40 Marks	
Amendment or Modification shall may be made by course coordinator as per situation or directed by the department/Examination cell/NEP-20 Scheme coordinator		

Name and signature of convener & member of BOS:

U. h K
(Dr. O.K. Shivaskanth)

2/12/25