

FOUR YEAR UNDER GRADUATE PROGRAM (2026-2027)

DEPARTMENT OF MATHEMATICS

COURSE CURRICULUM

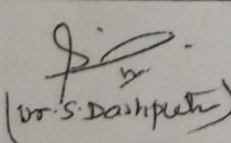
Part A: Introduction

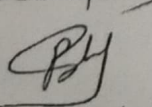
Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)		Semester - I	Session: 2026-2027
1	Course Code	MASC-01	
2	Course Title	Elementary Calculus	
3	Course Type	DSC	
4	Pre-requisite(if any)	Knowledge of basic Differential and Integral calculus	
5	Course Learning Outcome (CLO)	This Course will enable the students to: ➤ Know about ancient Indian Mathematicians and their contribution ➤ 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. ➤ Understand concepts of Curvature and Asymptotes. ➤ Draw curves in Cartesian and polar coordinate systems ➤ Understand the elementary integration of transcendental function and understand applications of reduction formulae.	
6	Credit Value	4 C	1 Credit = 15 hours- Learning and observation
7	Total Marks	Maximum Marks : 100	Minimum Passing Marks:40

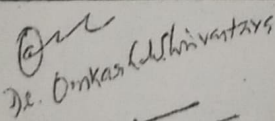
Part B: Content of the Course

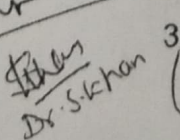
Total no of teaching – learning period =60 Periods (60 Hours)

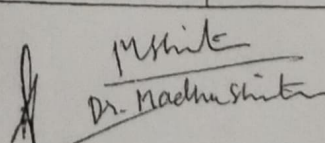
UNIT	Topics	No of Periods
I	Contributions and Biography of Indian Mathematicians: Bodhayan, Apasthamb, Katyayan, Mahaveeracharya, Brahmagupta and Bhaskaracharya in special context of Leelavati. Sequences, Continuity and Differentiability : Notion of convergence of sequences and series of real numbers, Definition of limit and continuity of a real valued function; Differentiability and its geometrical interpretation. Elementary Differentiation.	15
II	Expansion of Functions: Rolle's Theorem, Lagrange's mean value theorem, Cauchy's mean value theorem and their geometrical interpretations, Successive differentiation and Leibnitz theorem, Maclaurin's and Taylor's theorems for expansion of a function.	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

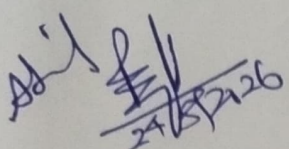
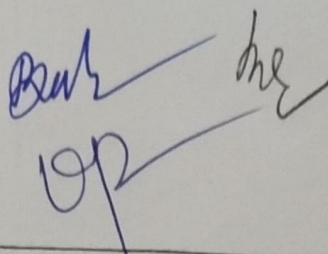
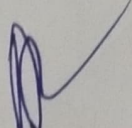
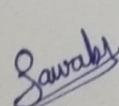
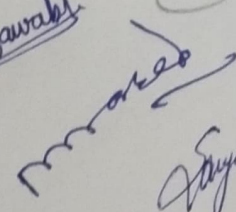

 (Dr. S. Dashputra)


 (Dr. P. K. Sahu)


 Dr. Onkar Lal Khosla


 Dr. S. K. Saha


 Dr. Madhusmita

IV	Integration: Elementary integration, Integration of Transcendental function, Reduction formulae, Definite integral.	15
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Part C - Learning Resource

Text Books, Reference Books, Other Resources

Text Books Recommended-

- Howard Anton, I. Bivens & Stephan Davis (2016). Calculus (10th edition). Wiley India.
- Gabriel Klambauer (1986). Aspects of Calculus. Springer-Verlag.
- Wieslaw Krawcewicz & Bindhyachal Rai (2003). Calculus with Maple Labs. Narosa.
- Gorakh Prasad (2016). Differential Calculus (19th edition). Pothishala Pvt. Ltd.

Reference Books Recommended-

- George B. Thomas Jr., Joel Hass, Christopher Heil & Maurice D. Weir (2018). Thomas' Calculus (14th edition). Pearson Education.
- Jerrold Marsden, Anthony J. Tromba & Alan Weinstein (2009). Basic Multivariable Calculus, Springer India Pvt. Limited.
- James Stewart (2012). Multivariable Calculus (7th edition). Brooks/Cole. Cengage.
- Monty J. Strauss, Gerald L. Bradley & Karl J. Smith (2011). Calculus (3rd edition). Pearson Education. Dorling Kindersley (India) Pvt. Ltd.

E-resources: <https://onlinecourses.nptel.ac.in>
<https://epqp.inflibnet.aci.in>
<https://swayam.gov.in>
<https://www.mooc.org>

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:		
Maximum Marks:	100 Marks	
Continuous Internal Assessment (CIA):	30 Marks	
End Semester Examination (ESE):	70 Marks	
Continuous Internal Assessment (CIA) (Conducted by course teacher)	Test /Quiz – 20+20 Marks Assignment/Seminar- 10 Marks	Better marks out of two test/quiz + obtained marks in Assignment shall be considered against 30 marks
End Semester Examination (ESE)	Two Section-A&B Section-A: Q1.Objective- 10x1=10 marks Q2. Short answer type question-5x4=20marks Section-B: Descriptive answer type question, 1 out of 2 from each unit- 10x4= 40 Marks	

Name and signature of convener & members of CBOS-

