

**FOUR YEAR UNDER GRADUATE PROGRAM (2024-28)**  
**DEPARTMENT OF MATHEMATICS**  
**COURSE CURRICULUM**

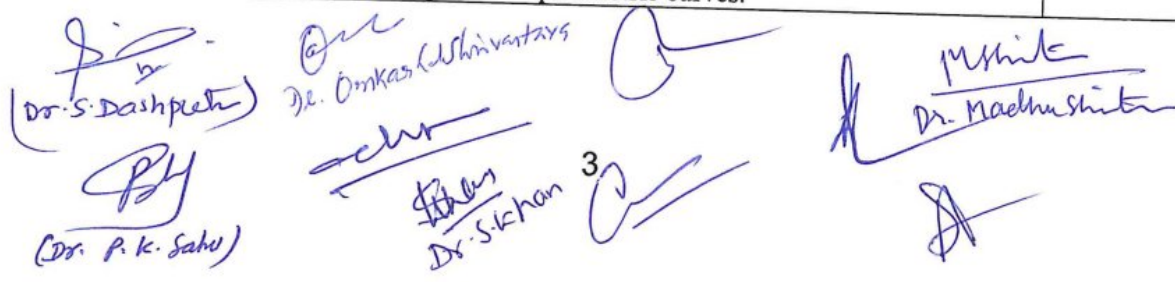
**Part A: Introduction**

<b>Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)</b>		<b>Semester - I</b>	<b>Session:2024-2025</b>
1	Course Code	<b>MASC-01</b>	
2	Course Title	<b>Elementary Calculus</b>	
3	Course Type	<b>DSC</b>	
4	Pre-requisite(if any)	Knowledge of basic Differential and Integral calculus	
5	Course Learning Outcome (CLO)	<p><b>This Course will enable the students to:</b></p> <ul style="list-style-type: none"> <li>➤ Know about ancient Indian Mathematicians and their contribution</li> <li>➤ Calculate the limit and examine the continuity and understand the geometrical interpretation of differentiability. Apply various tests to determine convergence.</li> <li>➤ Understand the consequences of various mean value theorems.</li> <li>➤ Understand concepts of Curvature and Asymptotes .</li> <li>➤ Draw curves in Cartesian and polar coordinate systems</li> <li>➤ Understand the elementary integration of transcendental function and understand applications of reduction formulae.</li> </ul>	
6	Credit Value	<b>4 C</b>	1Credit = 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
<b>I</b>	<p><b>Contributions and Biography of Indian Mathematicians:</b>                      Bodhayan, Apasthamb, Katyayan, Mahaveeracharya, Brahmagupta and Bhaskarachaya in special context of Leelavati.</p> <p><b>Sequences, Continuity and Differentiability :</b>                      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.</p>	<b>15</b>
<b>II</b>	<p><b>Expansion of Functions:</b>                      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.</p>	<b>15</b>
<b>III</b>	<p><b>Curvature, Asymptotes , Curve Tracing:</b>                      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.</p>	<b>15</b>


  
 (Dr. S. Dashputra)      Dr. Omkar Chhivartay      Dr. Madhusmita  
 (Dr. P. K. Sahu)      Dr. S. Khan      3

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

#### Text Books, Reference Books, Other Resources

##### Text Books Recommended-

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.

##### Reference Books Recommended-

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.

**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

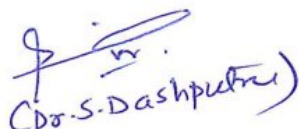
Better marks out of two test/quiz + obtained marks in Assignment shall be considered against 30 marks

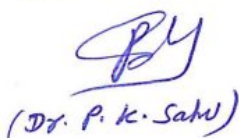
**End Semester Examination (ESE)**

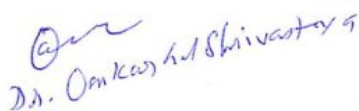
**Two Section-A&B**

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-**

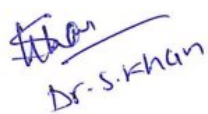
  
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