

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

<b>Part A: Introduction</b>			
<b>Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)</b>		<b>Semester - I</b>	<b>Session:2024-2025</b>
1	Course Code	<b>MAGE-01</b>	
2	Course Title	<b>Elementary Calculus</b>	
3	Course Type	<b>Generic Elective (GE)</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
<b>Part B: Content of the Course</b>			
<b>Total no of teaching – learning period =60 Periods (60 Hours)</b>			
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>
<b>IV</b>	<p><b>Integration:</b>                      Elementary integration, Integration of Transcendental function, Reduction formulae, Definite integral.</p>		<b>15</b>

Dr. S. Dashputra  
 (Dr. P. K. Sahu)  
 20  
 M.Mits

