ANNEXTURE IV

Title of the Course: Introduction to Calculus

Syllabus for Two credit Course-From the Academic Year-2024-2025

Name of the Course: Mathematics Minor: Semester II-Introduction to Calculus

Programmes:	
	Bachelor of Commerce (Management Studies)
	Bachelor of Commerce (Accounting & Finance)
	Bachelor of Commerce (Banking & Insurance)
	Bachelor of Commerce (Financial Markets)
	Bachelor of Science (Information Technology)

Sr. No.	Heading	Particulars
1	**Description of the course**	"Introduction to Calculus" is a foundational course in mathematics that introduces students to the fundamental concepts of calculus, including limits, derivatives, and integrals. It serves as a gateway to higher-level mathematics courses and is essential for understanding various quantitative disciplines such as physics, engineering, economics, and computer science. Industries that heavily rely on quantitative analysis, such as finance, engineering, and data science, have a high demand for individuals proficient in calculus.
2	**Vertical:**	Minor
3	**Type:**	Theory / Practical
4	**Credit**:	2 Credits
5	**Hours Allotted:**	30 Hours
6	**Marks Allotted**:	50 Marks (20 (CE) + 30 (SE)
7	**Course Objectives**: 1. Students should grasp the concept of limits and be able to evaluate limits algebraically and graphically. 2.Students should be able to apply differentiation to solve problems involving optimization, related rates, and curve sketching.	

8	**Course Outcomes**: 1. Students will be able to compute limits of functions, understanding the concept of continuity and its relationship to limits. 2. Students will understand the concepts of sequences and series, including convergence tests for series, Taylor and Maclaurin series, and power series representations of functions.
9	**Modules**:-
	Module 1: Real Numbers and Sequences (15 Hours)
	- The Algebraic and Order properties of R and Well Ordering Principle - Absolute value and Real line, Absolute Value Functions And Its Properties, Triangle Inequality, Neighborhood Of A Point On The Real Line - Sequences and their Limits, Definition And Examples Of Sequences Of Real Numbers, Uniqueness Of Limit, Bounded Sequence, Convergent Sequence - Monotone Sequence, Definition And Examples, Monotone Convergence theorem and examples
	Module 2: Limits and Continuity (15 Hours)
	- Functions and their graphs, Functions, Domain, Range, Graphs representing a function numerically, Vertical line Test - Increasing and Decreasing functions, Even And Odd Functions with their examples - Algebra of Limits, One Sided Limit, Infinite Limit - Continuous functions, Properties of continuous functions on an interval, Boundedness theorem, The Maximum-Minimum theorem
10	**Reference Books:** - Goldberg, R.R. Methods of Real Analysis. 1976. - Apostol, T.M. Calculus. Wiley & Sons Pvt Ltd, 1975. - Ghorpade, J.P., and Limaye. A Course in Calculus and Real Analysis. Springer International Ltd, 2021. - Kumar, Ajit, and Kumaresan. A Basic Course in Real Analysis. CRC Press, 2014. - Narayan, Shanti, and Mittal. A Course in Mathematical Analysis. S. Chand and Co, 2005.

11	**Internal Continuous Assessment: 40%**	**Semester End Examination: 60%**
12	**Continuous Evaluation through:**	Assignments and Practical

13	**Format of Question Paper:**
	Q. 1 Attempt any Three (15 marks)
	   a.
	   b.
	   c.
	   d.
	Q. 2 Attempt any Three (15 marks)
	   a.
	   b.
	   c.
	   d.	