Year	I	**Course Code:** 21BCA1C3LMF	**Credits**	03
Sem.	I	**Course Title:** Mathematical Foundation	**Hours**	40
Course Pre-requisites, if any	NA			
Formative Assessment Marks: 40	Summative Assessment Marks:: 60	Duration of ESA: 02 hrs.		
Course Outcomes	At the end of the course the student should be able to: 1. Study and solve problems related to connectives, predicates and quantifiers under different situations. 2. Develop basic knowledge of matrices and to solve equations using Cramer'srule. 3. Know the concept of Eigenvalues. 4. To develop the knowledge about derivatives and know various applications of differentiation. 5. Understand the basic concepts of Mathematical reasoning, set and functions			

Unit No.	**Course Content**	**Hours**
Unit I	**Basic concepts of set theory:** Mathematical logic introduction statementsConnectives-negation, Conjunction, disjunctionstatement formulas and truth tables- conditional and bi Conditional statements- tautology contradiction- equivalence of formulas-duality law-Predicates and Quantifiers, Arguments.	10
Unit II	**Operations on sets**: power set- Venn diagram Cartesian product-relations - functions- types of functions - composition of functions.	10
Unit III	**Matrix algebra:** Introduction-Types of matrices-matrix operations- transpose of a matrix - determinant of matrix - inverse of a matrix-Cramer's rule. **Matrix:** finding rank of a matrix - normal form-echelon form Cayley Hamilton theorem-Eigen values	12
Unit IV	**Differential calculus:** Functions and limits - Simple Differentiation of Algebraic Functions – Evaluation of First and Second Order Derivatives – Maxima and Minima	08

Recommended Learning Resources	
Print Resources	1. P. R. Vittal-Business Mathematics and Statistics, Margham Publications, Chennai B. S. Vatsa-Discrete Mathematics –New Age International Limited Publishers, New Delhi