

Subject Code : 2CS1010304	Subject Title: MATHEMATICS
Pre-requisite :	-

Course Objective:

In order to be able to formulate what a computer system is supposed to do, or to prove that it does meet its specification, or to reason about its efficiency, one needs the precision of mathematical notation and techniques. For instance, to specify computational problems precisely one needs to abstract the detail and then use mathematical objects such as sets, functions, relations, orders, and sequences. To prove that a proposed solution does work as specified, one needs to apply the principles of mathematical logic, and to use proof techniques such as induction. And to reason about the efficiency of an algorithm, one often needs to count the size of complex mathematical objects. The Discrete Mathematics course aims to provide this mathematical background.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)								
Lecture	Tutorial	Practical	Credit	Theory				Practical				Total
				University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
				Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	
3	1	-	4	28	70	12	30	-	-	-	-	100

Subject Contents			
Sr. No	Topics	Total Hours	Weight (%)
1	Set Theory: Introduction, Definition and Concepts, Representation of Sets, Finite Sets, Infinite Sets (Definition), Set Operations : Union, Intersection, Addition theorem, difference, Symmetric difference, D' Morgans Law, Subsets, Power Sets, Partitions Sets.	11	20
2	Functions: Introduction: Definitions and Concepts, Categories of function (Definition and Examples): One to One, onto functions, Into Functions, Identity Function, Equal Function, Composite Function. Mathematical Functions (Definition and Examples) : Floor and ceiling functions, Integer and Absolute value functions, Remainder functions, Exponential functions, logarithmic functions, Recursive functions.	11	20
3	Matrices: Metrics -Definition and Concept, Categories of Matrix (Definition and Examples): square Matrix, unit Matrix, null Matrix, Matrix Addition, Multiplication, Scalar multiplication, Transpose of a Matrix, Invertible Matrices	10	20
4	Sequences: Sequences: Introduction, Types of sequence: Finite Sequence, Infinite Sequence, Arithmetic progression (A.P), Geometric Progression (G.P).	8	20
5	Series: Series : Introduction, Types of series: Finite Series, Infinite Series, Arithmetic series (A.P),Permutation, Combinations	8	20

Course outcomes:

At the end of this course, the students would be able to:

- Understand fundamental mathematical concepts and terminology;
- Use and analyze recursive definitions;
- Develop Techniques for constructing mathematical proofs, illustrated by discrete mathematics examples.

List of References:

1. Discrete Mathematics (Second Edition) S.LIPSCHUTZ, M. LIPSON (TMH)
2. Elements of Discrete Mathematics C.L. LIU (TMH)
3. Discrete Mathematics J K SHARMA (Macmillan Publishers)
4. Advance Mathematics, Ravi Gor, Nirav Prakashan