FACULTY OF COMPUTER SCIENCE

Master of Computer Application (Sem-I)

In Effect from Academic Year 2023-24

Branch Name:	MCA
Program Code:	CS201
Course Name:	Mathematics for IT
Course Code:	3CS2010102
Pre-requisite Course:	Basic knowledge of Mathematics

Course Objective:

1. To understand of Basic of Mathematics and Statistics.
2. To present the foundations of many basic mathematical topics used in Computer Science including RDBMS, Data Structures, Analysis of Algorithms, Theory of Computation, Cryptography, Artificial Intelligence, Statistics and others.
3. To enhance the student's ability to think logically and mathematically.
4. To improve students ability in calculation.
5. To enable students to obtain an intuitive and working understanding of statistical methods for the basic problems and gain experience in the solving of statistical problems.

Teaching and Examination Scheme:

Teaching Scheme (Hours per				Evaluation Scheme (Marks)				
				Theory		Practical		
Lecture	Tutorial	Practical	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total
4	1	-	5	60	40	-	-	100

Course Contents			
Unit No	**Topics**	**Total Hours**	**Weightage (%)**
1	**UNIT-I : Mathematical Logic** Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers. Predicates: Predicative logic, Free & Bound variables, Rules of inference	10	20
2	**UNIT-II: Relations** Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices. Functions: Inverse Function Composition of functions, recursive Functions, Lattice and its Properties, Algebraic structures: Algebraic systems Examples and general properties, Semi groups and monads, groups sub groups' homomorphism, Isomorphism.	10	20
3	**UNIT-III: Set Theory** Introduction, Definition, Basic Concepts and Notations, Ordered Pairs and Cartesian Product, Set Operations, Representation of Sets, Finite Sets, Infinite Sets (Definition) Set Operations : Union, Intersection, Addition theorem, difference, Symmetric difference, D' Morgons Law, Subsets, Power Sets, Partitions	10	20

4	**UNIT-IV: Basic Concepts of Probability** Definition of probability, Application of permutations and combination to probability problems, Conditional probability, Baye's theorem	10	20
5	**Unit: V: Descriptive Statistics** Introduction to Statistics, Frequency distribution, Charts, Mean, Median, Mode, Percentiles, Variance, Standard Deviation, Coefficient of Variation, correlation coefficient.	10	20

Text Books:

1. Bernard Kolmann & others, "Discrete Mathematical Structure", Pearson Education, Sixth Edition
2. Statistical methods, Gupta S.P., S. Chand & Sons Pub, Delhi.

References Books:

1. K. H. Rosen, "Discrete Mathematics and its applications", Tata McGraw-Hill, 6th
2. Fundamentals of Statistics, Gupta S.S, Himalaya Publications House.
3. D. S. Malik & M. K. Sen, "Discrete Mathematics", Cengage Learning (2004)
4. J. P. Tremblay and W. K. Grassman. "Logic and Discrete Mathematics", Pearson Education

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	To **understand** the Basic Concepts and fundamentals of Mathematics and Statistics	2 Understanding
CLO2	To **study** the Mathematical Logic, Relations, Set Theory, Basic Concepts of Probability, Descriptive Statistics.	1 Remembering 2 Understanding 3 Applying
CLO3	To **apply** theory of Computation on Cryptography, Artificial Intelligence	3 Applying 2 Remembering
CLO4	To **understand** the Concepts of probability and statistics	2 Understanding,
CLO5	Compare usage of relations and functions.	1 Remembering 2 Understanding
CLO6	**Solve** relevant given problems using counting techniques.	3 Applying

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Mapping of CLOs with Pos & PSOs

Course Learning Outcomes	Program Out comes(POs)												Program Specific Outcomes(PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO1		M	L	M		M	H	L	M		M		H	M
CLO2	M	L			H	L		L		M	L	L	M	M
CLO3		L	M		M	M		L	M	M		L	M	L
CLO4	L		M	L	M		M		L		L		M	M
CLO5	M	L		M	L			M		L		L	M	L
CLO6	M		M		L	M			M	M		L	L	M

H:High, M:Medium, L:Low