MTS-123: DISCRETE STRUCTURES

GENERAL INFORMATION

Course Number	MTS-123
Credit Hours	4 hours
Prerequisite	N/A
Course Coordinator	Not Specified

COURSE OBJECTIVES

Discrete Mathematics also known as finite mathematics, The main focus of this course is to understand a particular set of mathematical facts and how to apply them, more importantly, such a course should teach students how to think logically and mathematically. This course covers the discrete data structures such as sets, relations, discrete functions, graphs, and trees, the subject of discrete structures widely used in the field of computer science for programming and reasoning about data.

CATALOG DESCRIPTION

MTS-123

COURSE CONTENT

Session No.	Date/Week	Topics	Suggested Readings
01-04	Week 01	Introduction to numbers, Mathematical reasoning	Discrete Mathematics & its Applications 7th Edition, K.H Rosen & Discrete Mathematics with applications 4th Edition, Susanna S.Epp,
05-08	Week 01-02	Introduction to logic , Propositional Logic, Negation, Disjunction, Conjunction, implications, ,Bicondition (Exclusives) & truth table	
09-12	Week 03-04	Rules of Inference, valid and invalid arguments and Applications of Propositional Logic	
13-16	Week 05	Propositional Equivalences, Predicates, Quantifiers, Introduction to Proofs & Method of proofs	
17-20	Week 06	Sets Set Operations Cardinality of Sets	
21-24	Week 07	Sequences & Summations Mathematical Induction , Induction and Recursion	
25-28	Week 08	Function, Composite function and Inverse functions, Genrating Functions	
29-32	Week 09-10	Relations and Their Properties n-ary Relations and Their Applications Representing Relations Equivalence Relations	
33-36	Week 10-11	Algorithms The Growth of Functions Complexity of Algorithms	

37-40	Week 11-12	Number Theory, Divisibility and Modular Arithmetic Integer Representations and Algorithms Primes and Greatest Common Divisors	
41-44	Week 13-14	Solving Congruence Applications of Congruence Cryptography An Introduction to Discrete Probability	
45-48	Week 14	The Basics of Counting Permutations and Combinations	
49-52	Week 15	Graphs and Graph Models Graph Terminology and Special Types of Graphs	
53-56	Week 16	Representing Graphs and Graph Isomorphism Euler and Hamilton Paths Shortest path problems	
57-58	Week 17	Boolean Algebra / Algebraic structures and coding theory	

TEXT BOOK

1. K.H Rosen,Discrete Mathematics , 7th Edition
2. Susanna S.Epp, Discrete Mathematics with applications 4th Edition

REFERENCE MATERIAL

1. Richard Johnson Baugh, Discrete Mathematics, 7th Edition
2. Kolman, Busby & Ross, Discrete Mathematical Structures, 4th Edition

COURSE LEARNING OUTCOMES

	Course Learning Outcomes (CLO)
1	Understand the key concepts of discrete structures such as sets, permutations, relations, graphs and trees.
2	To apply logic in the proofs of the propositions. Develop mathematical skills by practicing problem solving, modeling, logical reasoning and writing precise proofs.
3	Apply these concepts to solve computational problems.

CLO-SO Map

CLO ID	SO IDs											GA12
	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	
CLO 1	1	1	0	0	0	0	0	0	0	0	0	0
CLO 2	0	1	0	0	0	0	0	0	0	0	0	0
CLO 3	0	0	1	0	0	0	0	0	0	0	0	0

APPROVALS

Prepared By	Iftikhar Ahmed Bhutto
Approved By	
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