Lecture Plan

Name of the College: Government College of Arts, Science and Commerce. Sanquelim - Goa

Name of Faculty: Ruchi Paresh Fulari	**Subject:** Computer Science	
Paper code: CSC 201-Mathematical Foundation for Computer Science	**Program: SYBsc**	**Division:**
Academic year: 2024-2025	**Semester: III**	**Total Lectures: 45**

Course Objectives:

1. Students will be able to construct truth tables for complex propositional expressions, identifying tautologies, contradictions, and contingent statements. They will also gain the ability to write programs that effectively evaluate propositional expressions using logical operators.
2. Students will develop the skills to translate English sentences into predicate logic, determining the validity of predicate logic expressions. They will also be capable of implementing programs to evaluate predicate logic statements. This objective focuses on building a strong foundation in predicate logic and logical inference.
3. Students will acquire the ability to perform set operations, analyze properties of binary relations, and implement closure operations on relations. They will also identify various types of functions from given examples. This objective emphasizes the practical application of mathematical concepts in sets, relations, and functions.
4. Students will demonstrate proficiency in solving problems related to graph representations and implementing basic graph algorithms such as DFS, BFS, and Dijkstra's Algorithm. This objective aims to develop students' skills in algorithmic problem-solving within the context of graph theory.

Course Outcome:

1. Understand truth tables for complex propositional expressions, identify tautologies, contradictions, and contingent statements and write programs to evaluate propositional expressions using logical operators
2. Apply to translate English sentences into predicate logic, determine the validity of predicate logic expressions, and implement programs to evaluate predicate logic statements.
3. Perform set operations, analyze properties of binary relations, and implement closure operations on relations.
4. Solve problems related to graph representations and implement basic graph algorithms.

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books

July	08/07/2024	13/07/2024	3	Mathematical Logic, Statements and notations, Connectives ,Well-formed formulas , Truth tables, tautology, converse	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
July	15/07/2024	20/07/2024	3	Inverse , contrapositive , equivalence	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
July	22/07/2024	27/07/2024	3	Implication , , logical identities , Normal Forms	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
August	29/07/2024	03/08/2024	3	Predicates: Rules of inference , Consistency , Predicate calculus: Free and bounded variable	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
August	05/08/2024	10/08/2024	3	Quantifiers: Universal Quantifiers: Universal Quantifiers, Existential Quantifiers, Strings and their properties	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
August	12/08/2024	16/08/2024	3	Sets and Subsets , Sets with One Binary Operation, Sets with Two Binary Operations	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
August	19/08/2024	24/08/2024	3	Relations: Relations Properties of binary relations , Types of relations: equivalence , compatibility	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
August	26/08/2024	30/08/2024	3	Hasse diagram , Lattice and its properties , Closure of Relations , introduction to functions	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
September	02/09/2024	05/09/2024	3	Representation of Graph, DFS, BFS	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
September	16/09/2024	20/09/2024	3	Dijkstra's Algorithm Spanning Trees, planar Graphs, Trees	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
September	23/09/2024	27/09/2024	3	Automata, Computability, and Complexity: Complexity Theory	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
September-October	30/09/2024	05/10/2024	2	Computability Theory	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
October	07/10/2024	12/10/2024	3	Automata Theory	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
October	14/10/2024	19/10/2024	3	Definitions, Theorems and Proofs ,Types of Proof : By Construction	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran
October	21/10/2024	22/10/2024	2	Contradiction , Induction	Exercise	LCD Projector	Theory of Computer Science , K.L.P. Mishra N. Chandrasekaran

Component	Max Marks
ISA 1	7.5

Assessment Rubrics	ISA 2	7.5
	ISA 3	7.5
	Practical	25
	Project	-
	Semester End Exam	60