

M.Tech(IT) : Group A
Paper Code : MT31A
Paper Title : Logic And Functional Programming

SYLLABUS

1. Proposition Logic

Introduction of logic and Functional Paradigm, Propositional Concepts, Semantic Tableaux , Problem Solving with Semantic Tableaux.

2. Natural Deduction and Axiomatic Propositional Logic

Rules of Natural Deduction, Sequent Calculus, Axiomatic Systems, Meta theorems, Important Properties of AL, Resolution, Resolving Arguments

3. Introduction to Predicate Logic

Objects, Predicates and Quantifiers, Functions, First Order Language, Quantifiers, Scope and Binding, Substitution, An Axiomatic System for First Order Predicate Logic, Soundness and Completeness, Axiomatic Semantic and Programming

4. Semantic Tableaux & Resolution in Predicate Logic

Semantic Tableaux, Instantiation Rules, Problem-solving in Predicate Logic, Normal forms, Herbrand Universes and H-interpretation, Resolution, Unification, Resolution as a computing Tool

5. Prolog Concepts

Programming in Prolog (Overview), Meta Level Programming and Meta interpreters, Nondeterministic Programming, Incomplete Data Structure, Second Order Programming in Prolog, Logic Grammars: Definite Clause Grammar, A Grammar Interpreter.

6. Lazy and Eager Evaluation strategies

Evaluation Strategies, Lazy Evaluation: Evaluation Order and strictness of function, Programming with lazy evaluation, Interactive functional program, Dealy of unnecessary computation, Infinite Data Structure, Eager Evaluation and Reasoning.

REFERENCE BOOKS:-

- 1) John Kelly, "The Essence of Logic", Prentice-Hall India.
- 2) Saroj Kaushik, "Logic and Prolog Programming", New Age International ltd., Publisher