



Paper Code : TOC : 602

Paper Name : Theory of Computation

Teaching Hours (Per Week)		Examination Scheme		
TH. (hours)	Pr. (hours)	Internal	External	Total
		Th. (marks)	Th. (marks)	100 (marks)
4		30	70	

Lectures = 68 Hours

UNIT I (15 Hours)

Introduction to alphabets, strings and languages, finite automata and finite state machines, DFA (deterministic finite automata), NFA (non-deterministic finite automata), NFA with ϵ moves, equivalence among DFA, NFA and NFA with ϵ moves.

UNIT II (15 Hours)

Regular expressions, union, concatenation and Kleene closure operations on regular expressions, correspondence between finite automata and regular expressions, finite automata and regular expressions, finite automata with output like Moore and Mealy machines, pumping lemma for regular sets, Myhill-nerode theorem and minimization of finite automata.

UNIT III (15 Hours)

Context free grammar and languages, derivation trees, simplification of context free grammars, Chomsky normal form (CNF), Greibach normal form, ambiguity in grammars, push down automata, deterministic and non-deterministic push down automata, equivalence between push down automata and context free grammars.

UNIT IV (15 Hours)

Turing machines, Church's hypothesis, RAM machines, recursive and recursively enumerable languages, undecidability: properties of recursive and recursively enumerable languages, universal Turing machine and an undecidable problem and Rice's theorem.

UNIT V (8 Hours)

The Chomsky Hierarchy, Regular Grammars, Unrestricted Grammars, Context-sensitive languages, Relations between classes of languages.

Suggested text books and references:

1. Introduction to automata theory, language and computation by John E Hopcroft and Jeffrey D. Ullman, Narosa publishing house 1997.
2. Introduction to language and the theory of computation by John C. Martin McGraw Hill, International Editions 1991.