COURSE CONTENT

UNIT I

Finite Automata: Deterministic FA, Non deterministic FA, Regular expressions, Finite Automaton with €- moves, Regular Expression, Regular Languages and Kleene's theorem– Conversion of NFA to DFA, Equivalence of finite Automaton and regular expressions, Arden's Theorem. Myhill Nerode

Theorem, Minimization of DFA, Pumping Lemma for Regular sets, Problems based on Pumping Lemma.

UNIT II

Context Free Grammar: Grammar, Types of Grammar, Context Free Grammars and Languages, Derivations, Ambiguity, Relationship between derivation and derivation trees, Simplification of CFG, Elimination of Useless symbols - Unit productions - Null productions, Chomsky normal form (CNF), Greibach Normal form (GNF), Problems related to CNF and GNF.

UNIT III

Pushdown Automata: Moves, Instantaneous descriptions, Deterministic pushdown automata, Equivalence of Pushdown automata and CFL, pumping lemma for CFL, problems based on pumping Lemma.

UNIT IV

Turing Machine: Definitions of Turing machines, Computable languages and functions, Techniques for Turing machine construction, Multi head and Multi tape Turing Machines, The Halting problem, Partial Solvability, Problems about Turing machine- Chomsky hierarchy of languages.

UNIT V

Difficult problems: Unsolvable Problems and Computable Functions, Primitive recursive functions, Recursive and recursively enumerable languages, Universal Turing machine, Measuring and classifying complexity - Tractable and Intractable problems,