
AUTOMATA THEORY

Paper Code **CEN-502**

Course Credits **4**

Lectures / week **3**

Tutorial / week **1**

Course Description **UNIT – I**

Introduction to Finite Automata, strings, alphabets and languages, graphs & trees, state tables & diagram, NDFA & DFA concepts, Conversion of NFA to DFA, Minimization of FA, Mealy & Moore machines, state and machine equivalence.

UNIT- II

Regular Expressions, Identities for Regular expressions, Arden's Theorem, Conversion of FA to RE, Pumping Lemma for Regular sets.

UNIT- III

Context free Grammar, Chomsky Normal form and Greibach Normal form, Pushdown Automata, Context Free languages, Chomsky Classification of languages, Simplification of CFG, Pumping Lemma for context free languages, properties of context free languages, Push down automaton (PDA), conversion from PDA to CFG.

UNIT- IV

Turing Machines, Computing with Turing Machines, Non-deterministic Turing Machines, unrestricted grammars, context sensitive languages, Church's Thesis, Universal Turing Machines.

UNIT – V

Halting Problems, Unsolvability Problems about Turing Machines,

Time bounded Turing Machines, The Class P and NP Languages, NP Completeness, Some NP Complete Problems

**References / Text
Books:**

- J.E. Hopcroft & J.D. Ullmann, "Introduction to Automata Theory Language and Computation", Narosa Publications.
- K. L. P. Mishra & Chandrasekaran, "Theory of Computer Science: Automata, Languages and Computation", 3rd Edition, PHI
- H.R. Lewis & C.H. Papadimitrou, "Elements of the Theory of Computation", PHI
- John C. Martin, "Introduction to Languages and the Theory of Computation", McGraw-Hill International
- D.A. Cohen, "Introduction to Computer Theory", John Wiley.

**Computer Usage /
Software Requires:**
