

Course code	Course name	Course type	L-T-P-C
CSE302	Formal Language and Automata Theory	core	3-0-0-3

UNIT – I : Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non-deterministic finite automaton, transition diagrams and Language recognizers. Finite Automata with output- Moore and Melay machines.

UNIT – II : Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, Ambiguity in context free grammars. Minimization of Context Free Grammars. Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL.

UNIT – III : Push Down Automata: Definition of the Pushdown Automaton, the Languages of a PDA, Equivalence of PDA's and CFG's, Deterministic Pushdown Automata. Equivalence of CFL and PDA.

UNIT – IV : Introduction to Turing Machines-Problems That Computers Cannot Solve, The Turing Machine, Programming Techniques for Turing Machines, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines.

UNIT – V : Undecidability: A Language that is Not Recursively Enumerable, An Undecidable Problem That is RE, Undecidable Problems about Turing Machines, Post's Correspondence Problem, Other Undecidable Problems, Intractable Problems: The Classes P and NP, An NP-Complete Problem.

TEXT BOOKS:

1. Introduction to Automata Theory, Languages, and Computation, 3rd Edition, John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Pearson Education.
2. Introduction to the Theory of Computation, Michael Sipser, 3rd edition, Cengage Learning.

REFERENCE BOOKS:

1. Introduction to Languages and The Theory of Computation, John C Martin, TMH.
2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
3. A Text book on Automata Theory, P. K. Srimani, Nasir S. F. B, Cambridge University Press.
4. Introduction to Formal languages Automata Theory and Computation Kamala Krithivasan, Rama R, Pearson.
5. Theory of Computer Science – Automata languages and computation, Mishra and Chandrashekar, 2nd edition, PHI.