

Detailed contents	Contact hours
<p style="text-align: center;">Part A</p> <p>Formal Language, Non-Computational Problems, Diagonal Argument, Russels's Paradox.</p> <p>Theory of Automata: Deterministic Finite Automaton (DFA), Non-Deterministic Finite Automaton (NFA), Equivalence of DFA and NFA, Mealy and Moore Models, Minimization of Finite Automata.</p> <p>Regular Sets and Regular Grammars: Regular Languages, Regular Grammars, Regular Expressions, Properties of Regular Language, Pumping Lemma, Non-Regular Languages, Lexical Analysis.</p> <p>Context Free Language: Properties of Context Free Language, Chomsky Classification of Languages, Context Free Grammar, Simplification of Context Free Grammar, Chomsky Normal Form, Greibach Normal Form.</p>	22 hours
<p style="text-align: center;">Part B</p> <p>Push Down Automata: Ambiguity, Parse Tree Representation of Derivation Trees, Equivalence of PDA's and Pushdown Automaton (PDA), Non-Deterministic Pushdown Automaton (NPDA).</p> <p>Turing Machines (TM): Standard Turing Machine and its Variations; Universal Turing Machines, Models of Computation and Church-Turing Thesis.</p> <p>Recursive and Recursively-Enumerable Languages; Context-Sensitive Languages, Unrestricted Grammars, Chomsky Hierarchy of Languages, Construction of TM for Simple Problems.</p> <p>Unsolvable Problems and Computational Complexity: Unsolvable Problem, Halting Problem, Post Correspondence Problem, Unsolvable Problems for Context-Free Languages, Measuring and Classifying Complexity, Tractable and Intractable Problems.</p>	22 hours

Text Books:

1. Jeffrey Ullman and John Hopcroft, Introduction to Automata Theory, Languages, and Computation, 3e, Pearson Education India (2008).
2. K.L.P. Mishra, Theory of Computer Science: Automata, Languages and Computation, Prentice Hall India Learning Private Limited (2006).
3. John Martin, Introduction to Languages and the Theory of Computation, McGraw-Hill Higher Education (2007).

Reference Books:

1. Introduction to Computer Theory, Daniel. I.A. Cohen , John Wiley & Sons.

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