

[illegible]

<p>XVIII. Understand the power of the Turing Machine, as an abstract automaton, that describes computation, effectively and efficiently.</p> <p>XIX. Theory of Computation is important in programming language design, parsers, web-scrappers, Natural Language Processing (NLP), and is at the heart of modern compiler architectures.</p> <p>XX. Process the knowledge and skills for employability and to succeed in national and international level competitive exams.</p>		
<b>UNIT-I</b>	<b>FINITE AUTOMATA</b>	<b>Classes: 9</b>
<p>Fundamentals: Alphabet, strings, language, operations; Introduction to finite automata: The central concepts of automata theory, deterministic finite automata, nondeterministic finite automata, an application of finite automata, finite automata with epsilon transitions.</p>		
<b>UNIT-II</b>	<b>REGULAR LANGUAGES</b>	<b>Classes: 9</b>
<p>Regular sets, regular expressions, identity rules, constructing finite automata for a given regular expressions, conversion of finite automata to regular expressions, pumping lemma of regular sets, closure properties of regular sets (proofs not required), regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and finite automata, inter conversion.</p>		
<b>UNIT-III</b>	<b>CONTEXT FREE GRAMMARS</b>	<b>Classes: 10</b>
<p>Context free grammars and languages: Context free grammar, derivation trees, sentential forms, right most and leftmost derivation of strings, applications.</p> <p>Ambiguity in context free grammars, minimization of context free grammars, Chomsky normal form, Greibachnormal form, pumping lemma for context free languages, enumeration of properties of context free language (proofs omitted).</p>		
<b>UNIT-IV</b>	<b>PUSHDOWN AUTOMATA</b>	<b>Classes: 8</b>
<p>Pushdown automata, definition, model, acceptance of context free language, acceptance by final state and acceptance by empty stack and its equivalence, equivalence of context free language and pushdown automata, inter conversion. (Proofs not required). Introduction to deterministic context free languages and deterministic pushdown automata.</p>		
<b>UNIT-V</b>	<b>TURING MACHINE</b>	<b>Classes: 9</b>
<p>Turing machine: Turing machine, definition, model, design of Turing machine, computable functions, recursively enumerable languages, Church's hypothesis, counter machine, types of Turing machines (proofs not required), linear bounded automata and context sensitive language, Chomsky hierarchy of languages.</p>		
<b>Text Books:</b>		
<p>1. John E. Hopcroft, Rajeev Motwani, Jeffrey D.Ullman, "Introduction to Automata, Theory, Languages and Computation", Pearson Education, 3<sup>rd</sup> Edition, 2007.</p>		
<b>Reference Books:</b>		
<p>1. John C Martin, "Introduction to Languages and Automata Theory", Tata McGraw-Hill, 3<sup>rd</sup> Edition,</p>		

2007.

2. Daniel I.A. Cohen, “Introduction to Computer Theory”, John Wiley & Sons, 2<sup>nd</sup> Edition, 2004.

#### **Web References:**

1. [https://www.tutorialspoint.com/automata\\_theory/index.htm](https://www.tutorialspoint.com/automata_theory/index.htm)
2. <https://www.iitg.ernet.in/dgoswami/Flat-Notes.pdf>

#### **E-Text Books:**

<https://freefundkenotes.files.wordpress.com/2014/02/toc-klp-mishra.pdf>

#### **MOOC Courses:**

1. <http://nptel.ac.in/courses/111103016/>
2. <http://nptel.ac.in/courses/106106049/>
3. [http://onlinevideolecture.com/?course\\_id=1312](http://onlinevideolecture.com/?course_id=1312)
4. <http://www.nptelvideos.in/2012/11/theory-of-computation.html>