

CS -502: Theory of Computation

Finite Automata:

Languages: Alphabets, String, Language, Basic Operations on language, Concatenation, Kleene Star 04L

[1] : [chap. 2 p7-18]

Regular Expressions, Finite Automata and Regular languages, Deterministic and Nondeterministic Finite Automata 10L

[1] : [chap. 4 p31-48], [Ch. 5p52-71], [Ch. 7 p135-141], [Ch. 9 p169-185]

Pumping Lemma, Closure properties of Regular Languages 06L

[1] : [chap.. 10 (pumping lemma) p190-195]

[3]: [§4.2 p122-135]

Context Free languages:

Context free grammars, Parse Trees, Ambiguities in grammars and languages, Pushdown automata 10L

[1]: [chap.. 12 p224-254][Ch. 14 p289-311]

Chomsky's Normal Form, Pumping Lemma, Properties of Context free languages. 06L

[1]: [chap.. 13(CNF only) p278-282][Ch. 16 p351-364]

[3]: [§7.3 p264-273]

Computability:

Turing Machines: Turing machine as a model of Computation 06L

[2]:[§4.1 p179-190,§4.2 p194-200]

Universal Turing machine, Language Acceptability, Decidability, Halting Problem. 06L

[2]:[§5.2 , §5.3, §5.4 p247-256]

Reading Recommended Material

Text Books

1. Daniel I.A.Cohen, *Introduction to Computer Theory*, Second edition, John Wiley,1997.
2. Harry R. Lewis, Christos H. Papadimitriou, *Elements of the Theory of Computation*, 2nd edition, Pearson Education, 1998.
3. John E. Hopcroft, Rajeev Motwani, Jeffery D. Ullman, *Introduction to Automata Theory, Languages and Computation*, 3rd Edition Pearson Education, 2007.

Reference Books

4. P. Linz, *An Introduction to Formal Languages and Automata*, 5th Edition Jones Barlett, 2011.
5. John C. Martin, *Introduction to Languages and the Theory of Computation*, 4th edition, Tata McGraw Hill, 2011.