

MTCE 603A

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

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Credits : 4

Regular Grammar and Finite automata, NFA and DFA, NFA to DFA conversion, Pumping Lemma to checking the regularity of regular grammars, Reduction of states and design of equivalent finite automata, Context Free Grammar, possible defects in CFG and their removal, Chomsky and Greibach Normal Form. Push down automata, design of CFG corresponding to PDA and vice versa, Design of parser using PDA, Linear bound automata.

Turing machines as language recognizer, computer for positive integers, enumerator, universal Turing machine, halting problem, multi-tape and multi-head Turing machine, Post Machine, Solvability and undecidability, Rice's theorem, equivalence of general recursive and Turing computable function, primitive recursive function, post correspondence problem. Introduction to complexity theory and finding the time complexity of Turing machine.

References:

1. Introduction to automata theory, language & computations-Hopcroft & O.D. Ullman, R Mothwani, 2001, A.W.
2. Reference Books:
3. Theory of Computer Sc. (Automata, Languages and computations):K.L.P.Mishra & N.Chandrasekaran, 2000PHI.
4. Introduction to formal Languages & Automata-Peter LinZ, 2001, Narosa Publ.
5. Fundamentals of the Theory of Computation-Principles and Practice By RamondGreenlaw and H.James Hoover, 1998, Harcourt India Pvt. Ltd.
6. Elements of theory of Computation by H.R.Lewis & C.H.Papaditriou, 1998,PHI.
7. Introduction to languages and the Theory of Computation by John C.Martin 2003, T.M.H.