B.E. III YEAR COMPUTER ENGINEERING

CO 34002: THEORY OF COMPUTATION

Theory:

1. Introduction: L, G, & AT, Review of Sets, Graphs, Trees, Proof Techniques, Languages and Grammars – Fundamental Concepts Principal of Maths. Inche, proof by contradiction, etc.
2. Finite Automata- DFAs, NFAs, Regular Expressions, Regular Grammars and Languages, Properties of Regular Languages, Pumping Lemma for Regular Languages Applications of Regular Expressions .
3. Pushdown Automata- Context Free Grammar, Parsing, Ambiguity, Nondeterministic PDAs, Normal form of CFGs, CFG to NPDA, NPDA to CFGs. Deterministic PDA, Pumping Lemma for CFGs, Application of CFGs.
4. Turing Machines – Turing Machine as acceptor, Recognizing a Language, Universal TMs, Linear Bounded Automata, Context Sensitive Languages, Recursively Enumerable Languages, Unrestricted Grammars.
5. Chomsky Hierarchy, Concept of Solvability and Unsolvability, Church's Thesis, Complexity Theory – P and NP problems, Introduction to Petri Nets.

Text Books

1. Cohen John, "Introduction to Computer Theory", Second Edition, Wiley and Sons, 1996.
2. Hopcroft, Ullman, Motwani, "Introduction to Languages, Automata and Computation", 2nd Edition, Pearson Education, 2003.
3. Peter Linz, "An Introduction to Formal Languages and Automata", Jones and Bartlett, 2001.

Reference Books

1. Lewis and Papadimitiriou, "Elements of Theory of Computation", Pearson Education, 2002.
2. Mandrioli D. and Gezzi C., "Theoretical Foundations of Computer Science", Krieger Publishing Co., Inc., USA, 1993.
3. K.L.P. Mishra and N. Chandrasekaran, "Theory of Computation", Prentice Hall, 1998.
4. John C. Martin, "Introduction to Languages and the Theory of Computation", Mc Graw Hill, 2010.