

**Automata Theory Topics:**

DFA, NFA, epsilon-NFA, regular languages, regular expressions, decision algorithms of regular languages, pumping lemma, decision and closure properties of regular languages, CFGs, recursive and recursively enumerable languages, Context-free grammars, chomsky normal form, push-down automata, the equivalence of CFGs and PDAs, pumping lemma for CFGs, Turing and Total turing machines, Recursive and Recursively enumerable languages, Decidability, Universal Turing Machine, Rice's Theorem, Reductions, Post Correspondence Problem, Reduction of problems related to grammars to PCP, Intractable problems, Time bounded turing machines, P and NP classes, Karp and Cook reductions, Cook's Theorem, SAT and 3-SAT problem, NP hard problems, node cover problem, knapsack problem