MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY
BHOPAL - 462003

Name of Program **B.Tech** **Semester- IV** **Year- II**

Name of Course Theory of Computation

Course Code CSE 223

Core / Elective / Other Core

Prerequisite:

1. Concepts of set theory
2. Concepts of functions and relations

Course Outcomes:

On successful completion of the course, student be able to:

1. Construct deterministic and nondeterministic finite state automata (DFA and NFA) for solving simple decision problems and equivalence of regular expression with FSM.
2. Inspect capabilities of CFG and PDA.
3. Apply concept of Turing machine and un decidable problems.

Description of Contents in brief:

1. Introduction to Theory of computations, revision of basic set theory operations and relations
2. Finite State Machines, DFA, NFA and their conversions
3. Regular Expressions, Conversion of regular expression to NFA, DFA and vice versa
4. Regular Sets and their properties, Pumping Lemma
5. Output Machines Mealy and Moore machines
6. Context Free Grammar, Parse Tree, Simplification of CFG, Normalization of CFG
7. Push Down Automata, Non deterministic PDA
8. Context Free Languages and their properties, Regular Grammar
9. Turing Machines
10. Recursive and RE sets, Properties of recursive and RE sets.
11. Decidable and Un decidable problems, Non-RE language
12. The Universal Turing Machine, Rice's Theorem, Post Correspondence Problem

List of Text Books:

1. Introduction to automata theory, language & computations Hopcroaf, Ullman and Motwani,

List of Reference Books:

1. Theory of Computer Sc. (Automata, Languages and computation): K.L.P. Mishra & N. Chandrasekaran,
2. Introduction to formal Languages & Automata Peter Linz,
3. Fundamentals of the Theory of Computation- Principles and Practice, Ramond Greenlaw and H. James Hoover

URLs:

1. https://nptel.ac.in/courses/106/104/106104148/
2. https://nptel.ac.in/courses/106/104/106104028/