Course Type	Course Code	Name of Course	L	T	P	Credit
DC6	CSC208	**Theory of Computation**	3	0	0	9

Course Objective
The objective of the course is to provide fundamental knowledge about how to solve various computational problems using Automaton.
Learning Outcomes
Upon successful completion of this course, students will have a broad understanding of Theory of Computation course.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Introduction, Languages	2	Comprehensive introduction about the course content will be delivered.
2	Deterministic Finite Automata (DFA) and Non-Deterministic Finite Automata (NFA) Equivalence of DFA and NFA, State Minimization of DFA, Finite Automata with Epsilon-Transitions.	7	To understand the working procedure of DFA and NFA.
3	Regular Expression and their relation to Regular Language, Pumping Lemma for Regular Languages	5	To learn how to describe finite automata through Regular Language.
4	Context-Free Grammars (CFG), Parse Trees, Ambiguity in CFG, Normal forms for CFG: CNF and GNF.	8	To understand Context-Free Grammars (CFG) and their different forms of representation.
5	Pumping Lemma for CFG, Pushdown Automata (PDA), Equivalence of PDA's and CFG's.	6	This unit will help students to understand PDA.
6	Turing Machines (TM), Multitrack TM, Multitape TM, Non-deterministic TM and their equivalence	7	To understand the more powerful type of automaton i.e. Tuning Machine.
7	Decidability and Undecidability, Computational Complexity, NP Completeness Problems	7	This unit will help students to understand Decidability and Undecidability problems.

Text Books:

1. John E. Hopcroft, Rajeev Motwani, and Jeffrey D Ullman, Introduction to Automata Theory, Languages, and Computation, Pearson, 3rd Edition, 2008
2. Peter Linz, An Introduction to Formal Languages and Automata, 6th Edition, Market Paperback, 2016

Reference Books:

Harry Lewis, and Christos H. Papadimitriou, Elements of the Theory of Computation, Pearson, 2nd Edition, 2015