1	Course No.		**CSE 202**
2	Course Title		**THEORY OF AUTOMATA**
3	Credits		**4**
4	Contact Hours		**3-1-0**
5	Course Objective		To have an introductory knowledge of automata designing of DF and NDFA, formal language theory and computation.
6	Course Outcomes		After Successful completion of this course, the student shall be able to: 1. Use the concept of Automata and related terminology 2. Design DFA and NDFA and conversion from NDFA to DFA, 3. Construct finite automata without output and with output 4. Implement regular expression and grammar corresponding to DFA and vice-versa, 5. Design Push down Automata from Context Free Language or Grammar and vice-versa 6. Design Turing Machine for computational problems, Develop a clear understanding of un-decidability
7	Outline syllabus:		
7.01	Unit A		**Finite Automata**
7.02	Unit A Topic 1		Introduction to languages, Kleene closures, Finite Automata (FA), Transition graph, Nondeterministic finite Automata (NFA), Deterministic finite Automata (DFA).
7.03	Unit A Topic 2		Equivalence of NDFA and DFA, Construction of DFA from NFA and optimization of Finite Automata.
7.04	Unit A Topic 3		Applications and Limitation of FA. (FAT tool).
7.05	Unit B		**Regular Expression and Finite Automata**
7.06	Unit B Topic 1		Regular Expression, Finite Automata with null move, Regular Expression to Finite Automata.
7.07	Unit B Topic 2		Arden Theorem, Pumping Lemma for regular expressions.
7.08	Unit B Topic 3		FA with output: Moore machine, Mealy machine and Equivalence.
7.09	Unit C		**REGULAR & CONTEXT FREE LANGUAGE**
7.10	Unit C Topic 1		Defining grammar, Chomsky hierarchy of Languages and Grammar. Ambiguous to Unambiguous CFG.
7.11	Unit C Topic 2		Simplification of CFGs.

7.12	Unit C Topic 3		Normal forms for CFGs, Pumping lemma for CFLs.
7.13	Unit D		**PUSH DOWN AUTOMATA**
7.14	Unit D Topic 1		Description and definition of PDA and Non-Deterministic PDA, Working of PDA.
7.15	Unit D Topic 2		Acceptance of a string by PDA with final state and with Null store. Two stack PDA.
7.16	Unit D Topic 3		Conversion of PDA into CFG, Conversion of CFG into PDA.
7.17	Unit E		**TURING MACHINE**
7.18	Unit E Topic 1		Turing machines (TM): Basic model, definition and representation, Language acceptance by TM.
7.19	Unit E Topic 2		Turing machine as a computational machine, Halting problem of TM, Universal TM (Visual Turing machine).
7.20	Unit E Topic 3		Modifications in TM, Undecidability of Post correspondence problem, Church's Thesis, Godel Numbering.
9	References		
9.1	Text book	1. K.L.P. Mishra and N.Chandrasekaran, "Theory of Computer Science(Automata, Languages and Computation)", PHI	
9.2	Other references	1. Peter Linz, "Formal Languages and Auomata", Narosa Publishing House 2. Hopcroft, Ullman, "Introduction to Automata Theory, Language and Computation", Narosa Publishing House 3. Internet as a resource for reference	