Lesson Teaching Plan

Subject: Automata Theory	**Branch:** Computer Application
Semester: 4th Sem	**Faculty name:** Bighnaraj Naik

Module	Topic	No. of classes
1	Introduction to Automata: The Methods Introduction to Finite Automata, Structural Representations, Automata and Complexity. Proving Equivalences about Sets	1
	Proof by Contradiction, Inductive Proofs: General Concepts of Automata Theory: Alphabets Strings, Languages, Applications of Automata Theory.	1
2	Finite Automata: The Ground Rules, The Protocol, Deterministic Finite Automata: Definition of a Deterministic Finite Automata	1
	How a DFA Processes Strings, Simpler Notations for DFA's, Extending the Transition Function to Strings	1
	The Language of a DFA, Nondeterministic Finite Automata: An Informal View.	1
	The Extended Transition Function, The Languages of an NFA, Equivalence of Deterministic and Nondeterministic Finite Automata.	1
	Finite Automata With Epsilon-Transitions: Uses of $\in$-Transitions	1
	The Formal Notation for an $\in$-NFA, Epsilon-Closures, Extended Transitions and Languages for $\in$-NFA's	1
	Eliminating $\in$-Transitions.	1
3	Regular Expressions and Languages: Regular Expressions: The Operators of regular Expressions, Building Regular Expressions	1
	Precedence of Regular-Expression Operators, Precedence of Regular-Expression Operators, Finite Automata and Regular Expressions: From DFA's to Regular Expressions	1
	Converting DFA's to Regular Expressions	1
	Converting DFA's to Regular Expressions by Eliminating States	1
	Converting Regular Expressions to Automata. Algebraic Laws for Regular Expressions	1
	Properties of Regular Languages: The Pumping Lemma for Regular Languages	1
	Applications of the Pumping Lemma Closure Properties of Regular Languages	1
	Decision Properties of Regular Languages, Equivalence and Minimization of Automata	1
4	Context-Free Grammars and Languages: Definition of Context-Free Grammars, Derivations Using a Grammars Leftmost and Rightmost Derivations, The Languages of a Grammar,	1
	Parse Trees: Constructing Parse Trees, The Yield of a Parse Tree, Inference Derivations, and Parse Trees, From Inferences to Trees,	1
	From Trees to Derivations, From Derivation to Recursive	1

	Inferences, Applications of Context-Free Grammars: Parsers	
	Ambiguity in Grammars and Languages: Ambiguous Grammars, Removing Ambiguity From Grammars, Leftmost Derivations as a Way to Express Ambiguity, Inherent Ambiguity	1
5	Pushdown Automata: Definition Formal Definition of Pushdown Automata, A Graphical Notation for PDA's, Instantaneous Descriptions of a PDA,	1
	The Languages of a PDA: Acceptance by Final State, Acceptance by Empty Stack	1
	From Empty Stack to Final State, From Final State to Empty Stack	1
	Equivalence of PDA's and CFG's:	1
	From Grammars to Pushdown Automata,	1
	From PDA's to Grammars	1
	Deterministic Pushdown Automata: Definition of a Deterministic PDA, Regular Languages and Deterministic PDA's, DPDA's and Context-Free Languages, DPDA's and Ambiguous Grammars	1
6	Properties of Context-Free Languages: Normal Forms for Context-Free Grammars, The Pumping Lemma for Context-Free Languages,	1
	Closure Properties of Context-Free Languages, Decision Properties of CFL's	2
7	Introduction to Turing Machines: The Turing Machine: The Instantaneous Descriptions for Turing Machines	2
	Transition Diagrams for Turing Machines, The Language of a Turing Machine	2
	Turing Machines and Halting, Programming Techniques for Turing Machines, Extensions to the Basic Turing Machine	1
	Restricted Turing Machines, Turing Machines and Computers	1
8	Undecidability: A Language That is Not Recursively Enumerable, Enumerating the Binary Strings, Codes for Turing Machines	1
	An Un-decidable Problem That Is RE: Recursive Languages, Complements of Recursive and RE languages	1
	The Universal Languages, Un-decidability of the Universal Language Un-decidable Problems About Turing Machines: Reductions, Turing Machines That Accept the Empty Language	1
	Post's Correspondence Problem: Definition of Post's Correspondence Problem, The "Modified" PCP, Other Un-decidable Problems: Un-decidability of Ambiguity for CFG's	1
	Total no. of classes:	42