VELAMMAL COLLEGE OF ENGINEERING & TECHNOLOGY, MADURAI-625 009
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
2023-2024 ODD SEMESTER
COURSE PLAN

Degree	**B.E-CSE**
Course Code-Title	**21CS301-Theory of Computation**
Batch	**2021-2025**
Year/Semester/section	**III/V/A&B**
Course Component	**Professional core**
Name of the Instructor	**Mr.K.Azarudeen**

Session No	Topic to be covered	Text/Reference Book Page No.	Mode of Delivery	Teaching Aid	No. of Hours	Cumulative No. of Hours
UNIT I AUTOMATA FUNDAMENTALS						
1.	Chomskian Hierarchy	R2(294-296)	L+ PS(Tx)	BB,PPT	1	1
2.	Introduction to Automata Theory-Alphabets, Strings and Languages.	T1(27-33)	L+ PS(Tx)	BB,PPT	1	2
3.	Finite Automata- Deterministic finite Automata (DFA)	T1(35-50)	L+ PS(Tx)	BB,PPT	2	4
4.	Nondeterministic finite Automata (NFA)	T1(53-61)	L+ PS(Tx)	BB,PPT	3	7
5.	Finite Automata with epsilon transition.	T1(68-76)	L+ PS(Tx)	BB,PPT	2	9
UNIT II REGULAR EXPRESSIONS AND LANGUAGES						
6.	Regular Expression and Languages-Operation of regular expression and their precedence	T1 (79-84)	L+ PS(Tx)	BB,PPT	1	10
7.	Finite Automata and Regular expression	T1(85-113)	L+ PS(Tx)	BB,PPT	1	11
8.	DFA to Regular Expression		L+ PS(Tx)	BB,PPT	2	13
9.	Regular expression to Finite Automata-Algebric laws of Regular Expression		L+ PS(Tx)	BB,PPT	2	15
10.	Pumping Lemma for regular Languages	T1(117-121)	L+ PS(Tx)	BB,PPT	1	16
11.	Closure properties of Regular Languages	T1(122-139)	L+ PS(Tx)	BB,PPT	2	18
12.	Equivalence and Minimization of Finite Automata.	T1(143-152)	L+ PS(Tx)	BB,PPT	2	20
UNIT III CONTEXT FREE GRAMMAR AND LANGUAGES						
13.	Context Free Grammar-Parse tree-Ambiguity in Grammar and Language	T1(157-201)	L+ PS(Tx)	BB,PPT	2	22

14.	Simplification of CFGs	T1(239-246)	L+ PS(Tx)	BB,PPT	2	24
15.	Normal forms for CFGs – Chomsky Normal Form, Greibach Normal Form	T1(250-253)	L+ PS(Tx)	BB,PPT	3	27
16.	Closure properties of CFLs	T1((264-275)	L+ PS(Tx)	BB,PPT	2	29
17.	Pumping lemma for CFLs.	T1(257-264)	L+ PS(Tx)	BB,PPT	1	30
UNIT IV PUSHDOWN AUTOMATA AND LINEAR BOUNDED AUTOMATA						
18.	Definition of PDA- Language of PDA	T1(205-220)	L+ PS(Tx)	BB,PPT	3	33
19.	Equivalence of PDA and CFG	T1(223-232)	L+ PS(Tx)	BB,PPT	3	36
20.	Deterministic PDA	T1(232-236)	L+ PS(Tx)	BB,PPT	1	37
21.	Context-sensitive languages: Context-sensitive grammars (CSG) and languages	R2 (289-293)	L+ PS(Tx)	BB,PPT	2	39
22.	Linear bounded automata and equivalence with CSG		L+ PS(Tx)	BB,PPT	2	41
UNIT V TURING MACHINES AND UNDECIDABILITY						
23.	Turing Machine	T1(287-306)	L+ PS(Tx)	BB,PPT	1	42
24.	Programming Techniques for TM	T1(308-314)	L+ PS(Tx)	BB,PPT	1	43
25.	Variations of TM	T1(243-247)	L+ PS(Tx)	BB,PPT	1	44
26.	Universal TM	T2(252-256)	L+ PS(Tx)	BB,PPT	1	45
27.	Non Recursive Enumerable (RE) Language	T1(343-348)	L+ PS(Tx)	BB,PPT	1	46
28.	Undecidable Problem with RE	T1(349-357)	L+ PS(Tx)	BB,PPT	1	47
29.	Undecidable Problems about TM	T1(358-366)	L+ PS(Tx)	BB,PPT	1	48
30.	Post's Correspondence Problem.	T1(366-377)	L+ PS(Tx)	BB,PPT	2	50

.TEXT BOOK(S):

1. Hopcroft J.E., Motwani R. and Ullman J.D, "Introduction to Automata Theory, Languages and Computations", 3rdEdition, Pearson Education, 2008.
2. John .C.Martin, —Introduction to Languages and the Theory of Computation‖, Fourth Edition, Tata Mcgram Hill, 2003.

REFERENCE BOOK(S):

1. Peter Linz, "An Introduction to Formal Language and Automata", 4th Edition, Narosa Publishers, New Delhi, 2016.

Course In charge | Course Coordinator | Module Coordinator | HoD/CSE