

**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
<b>UNIT I AUTOMATA FUNDAMENTALS</b>						
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
<b>UNIT II REGULAR EXPRESSIONS AND LANGUAGES</b>						
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-Algebraic 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
<b>UNIT III CONTEXT FREE GRAMMAR AND LANGUAGES</b>						
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", 3<sup>rd</sup> Edition, Pearson Education, 2008.
2. John .C.Martin, –Introduction to Languages and the Theory of Computationl, Fourth Edition, Tata Mcgram Hill, 2003.

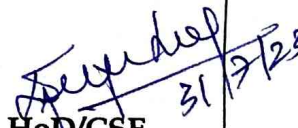
#### REFERENCE BOOK(S):

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

  
Course In charge

  
Course Coordinator

  
Module Coordinator

  
HoD/CSE