

SWARNANDHRA

COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF INFORMATION TECHNOLOGY

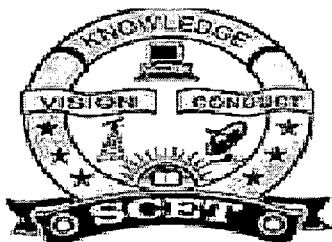
TEACHING PLAN

Course Code	Course Title	Semester/Regulation	Branch	Contact Periods /Week	Academic Year	Date of commencement of Semester
23IT5T02	Automata Theory and Compiler Design	V/(R23)	IT	6	2025-2026	09/06/202

COURSE OUTCOMES

1	Analyze and design DFAs, NFAs, proving their equivalence, and applying regular expression
2	Understand CFGs and design PDAs, relating them to context-free languages
3	Perform the syntax analysis by using parsing techniques.
4	Implement parsers (LL/LR) and apply semantic rules and error detection/correction technique
5	Apply various techniques to improve program efficiency (space/time complexity).

UNIT	OutComes / Bloom's Level	Topics No.	Topics/ Activity	Text Book/ Reference	Contact Hour	Delivery Method
I	CO – 1		UNIT – I: Regular Expressions, Languages and Finite Automata			Chalk & Board Power poir presentation Assignmen Test
		1.1	Formal Languages and the Chomsky Hierarchy	T1,T2	1	
		1.2	Regular Expressions and Regular Languages	T1,T2	1	
		1.3	Algebraic Laws for Regular Expressions	T1,T2	1	
		1.4	Applications of Regular Expressions	T1,T2	1	
		1.5	Abstract model of Finite Automaton	T1,R1	1	
		1.6	Transition Tables and Transition Graphs	T1,R1	1	
		1.7	Deterministic Finite Automata (DFA)	T1,R1	1	
		1.8	Nondeterministic Finite Automata (NFA)	T1,R1	1	
		1.9	Converting NFA to DFA	T1,R1	1	
		1.10	Finite Automata with ϵ transitions (NFA- ϵ)	T1,R1	1	
		1.11	Converting NFA- ϵ to NFA/DFA	T1,T2	1	



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		1.12	Minimization of Finite Automata	T1,T2	1	
		1.13	Equivalence of FA and Regular Expressions	T1,T2	1	
Content beyond syllabus		1.14	Bootstrapping	R2	1	
Total					14	
II	CO – 2		UNIT-II: Context Free Grammars and Push Down Automata			
		2.1	Context Free Grammars(CFG)	T1,R2	1	Chalk & Board
		2.2	Context Free Languages(CFL)	T1,R2	1	
		2.3	Design of CFGs	T1,R2	1	
		2.4	Leftmost and Rightmost Derivations	T1,R2	1	Power point presentation
		2.5	Parse Trees	T1,R2	1	
		2.6	Applications of CFGs	T1,R2	1	Assignment Test
		2.7	Ambiguity in Grammars and Languages	T1,R2	1	
		2.8	Push Down Automata (PDA),	T1,R2	1	
		2.9	The Language of a PDA	T1,R2	1	
			Equivalence of PDAs and CFGs	T1,R2	1	
Content beyond syllabus		2.10	Elimination of ambiguity	R1	1	
Total					10	
III	CO – 3		UNIT-III: Lexical Analysis and Top-Down Parsing			
		3.1	The structure of a compiler	T1,R2	1	Chalk & Board
		3.2	Role of lexical analyzer	T1,R2	1	
		3.3	Input Buffering	T1,R2	1	
		3.4	Specification of tokens	T1,R2	1	
		3.5	Recognition of tokens	T1,R2	1	
		3.6	The Lexical Analyser Generator –LEX	T1,R2	1	Power point presentation
		3.7	Introduction to Syntax Analysis	T1,R2	1	
		3.8	Eliminating ambiguity	T1,R2	1	
		3.9	left recursion from a CFG	T1,T2	1	Assignment Test
		3.10	Recursive Decent Parsing	T1,T2	1	
		3.11	LL(1) Grammars	T1,R2	1	
		3.12	Nonrecursive Predictive Parsing		1	
Content beyond syllabus		3.13	Operator precedence parsing	R2	1	
Total					13	



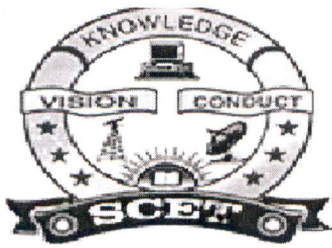
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IV	CO – 4		UNIT-IV: Bottom-Up Parsing and Syntax Directed Translation			Chalk & Board Power poir presentation Assignmen Test
		4.1	Shift-Reduce Parsing	T1,R2	1	
		4.2	Simple LR parsing	T1,R2	1	
		4.3	Canonical LR(1) Parsing	T1,R2	1	
		4.4	LALR Parsing	T1,R2	1	
		4.5	Parser Generators	T1,R2	1	
		4.6	Syntax Directed Definitions	T1,R2	1	
		4.7	Evaluation Orders for SDDs	T1,R2	1	
		4.8	Syntax Directed Translation Schemes	T1,R2	1	
Content beyond syllabus		4.15	Storage Allocation Strategies	R3	1	
Total					09	
CO-5		UNIT-V: Intermediate Code Generation, Code Optimization and Generation				Chalk & Board Power poir presentation Assignmen Test
	5.1	Three address code	T1,T2	1		
	5.2	Types and Declarations	T1,T2	1		
	5.3	Translation of Expressions	T1,T2	1		
	5.4	Type Checking	T1,T2	1		
	5.5	Control Flow	T1,T2	1		
	5.6	Basic Blocks and Flow Graphs	T1,T2	1		
	5.7	Optimization of Basic Blocks	T1,T2	1		
	5.8	Peephole Optimization	T1,T2	1		
	5.9	Issues in the design of a Code Generator	T1,T2	1		
	5.10	The Target Language	T1,T2	1		
5.11	A simple Code Generator	T1,T2	1			
Total					11	
CUMULATIVE PROPOSED PERIODS					57	



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Text Books:

S.No	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	J.E.Hopcroft, R.Motwani and J.D.Ullman, Introduction to Automata Theory, Languages and Computation, , 3rd Edition, Pearson, 2008.
2	Alfred V.Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Compilers Principles, Techniques and Tools, 2nd Edition, Pearson, 2022.

Reference Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	John C. Martin, McGraw Hill, Introduction to Languages and The Theory of Computation, 2020
2	K.L.P.Mishra and N.Chandrasekaran, Theory of Computer Science-Automata, Languages and Computation, , 3rd Edition, PHI, 2007
3	K.V.N. Sunitha, Compiler Construction, Pearson, 2013
4	SandeepSaxena, Rajkumar Singh Rathore, Compiler Design, , S.Chand publication, 2019

Web Details:

1	https://www.geeksforgeeks.org/compiler-design-tutorials/
2	https://www.guru99.com/compiler-design-tutorial.html
3	https://www.tutorialspoint.com/compiler_design/compiler_design_overview.htm
4	https://www.greatlearning.in/academy/learn-for-free/courses/compiler-design

	Name	Signature with Date
i. Faculty	Mr.K.Raja	<i>K. Raja</i>
ii. Module Coordinator	Mr.K.Raja	<i>K. Raja</i>
iii. Programme Coordinator	Dr. RVVS Prasad	<i>Dr. RVVS Prasad</i>

[Signature]
Principal