DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

IV B.Tech, I Semester, Academic Year: 2026-2027

Course Name : Compiler Design (23CS702)

L--T--P : 3-0-0

Course Instructor : Mrs. Swarna Ramya P

Prerequisites:

1. A course on "Formal Languages and Automata Theory".
2. A course on "Computer Organization and Architecture"
3. A course on" Data Structures".

Course Objectives:

1. Introduce the major concepts of language translation and compiler design and impart the knowledge of practical skills necessary for constructing a compiler.
2. Topics include phases of compiler, parsing, syntax directed translation, type checking use of symbol tables, code optimization techniques, intermediate code generation, code generation and data flow analysis.

Course Outcomes:

1. Demonstrate the ability to design a compiler given a set of language features.
2. Demonstrate the knowledge of patterns, tokens & regular expressions for lexical analysis.
3. Acquire skills in using lex tool & yacc tool for developing a scanner and parser.
4. Design and implement LL and LR parsers
5. Design algorithms to generate machine code and perform code optimization in order to improve the performance of a program in terms of space and time complexity.

UNIT-I

S.No		Questions	BT	CO	PO
Part–A (Short Answer Questions)					
1		Define Compiler?	L1	CO1	PO3
2		List the phases of a compiler.	L1	CO1	PO3
3		Differentiate compiler and interpreter.	L2	CO1	PO2
4		Define token, lexeme, and pattern.	L1	CO1	PO3
5		What is lexical analysis?	L1	CO1	PO3
6		Define finite automata.	L1	CO1	PO3
7		Differentiate DFA and NFA.	L2	CO1	PO2
8		What are regular expressions?	L1	CO1	PO3
9		Explain input buffering.	L2	CO1	PO2
10		What is Lex?	L1	CO1	PO2
Part–B (Long Answer Questions)					
11	a)	Explain structure of compiler with diagram	L2	CO1	PO3,PO2
	b)	Discuss phases of compiler	L2	CO1	PO3,PO2
12	a)	Explain lexical analyzer and functions	L2	CO1	PO3,PO2
	b)	Explain finite automata with examples	L3	CO1	PO3
13	a)	Convert RE to finite automata	L3	CO1	PO3,PO2
	b)	Explain working of Lex tool	L3	CO1	PO2
14	a)	Examine the design of a lexical analyzer generator and differentiate the roles of its major components.	L4	CO1	PO3,PO2
	b)	Analyze DFA optimization techniques and evaluate their effectiveness in improving pattern matching performance.	L4	CO1	PO3,PO2
15	a)	Explain specification and recognition of tokens	L3	CO1	PO3

	b)	Discuss symbol table management in lexical analysis	L3	CO1	PO3,PO2