

Course code: Course Title	Course Structure			Pre-Requisite
SE304: Compiler Design	L	T	P	Theory of Computation
	3	1	0	

Course Objective: To study the design of all the phases of compiler in detail.

S. NO	Course Outcomes (CO)
CO1	Demonstrate basic concepts of compiler and compilation of different phases.
CO2	Represent language tokens using regular expressions, context free grammar and finite automata and design lexical analyzer for a language.
CO3	Design syntax directed translation schemes for a given context free grammar.
CO4	Evaluate symbol table structures, runtime memory management strategies, and error detection & recovery methods to enhance compiler efficiency.
CO5	Apply optimization techniques to intermediate code and generate machine code for high level language program.

S. NO	Contents	Contact Hours
UNIT 1	Introduction: Definition, Phases and Passes, FSM & RE's and their application to Lexical Analysis, Implementation of Lexical Analyzers, Lexical- Analyzer Generator, Lex – Compiler.	6
UNIT 2	Syntax Analysis: Formal Grammar and their application to Syntax Analysis, BNF Notation,. The Syntactic specification of Languages: CFG, Derivation and Parse Trees, Shift Reduce Parsing, Operator precedence parsing, top down Parsing, Predictive Parsers. LR Parsers, the canonical collection of LR(0)items, constructing SLR Parsing Tables, Constructing canonical LR Parsing tables and LALR parsing tables, An Automatic Parser Generator, YACC.	12
UNIT 3	Syntax Directed Translation: Syntax directed Translation Schemes, Implementation of Syntax directed translators, Intermediate Code, Postfix notation, Parse Trees and Syntax Trees, Three address Code, Quadruple & Triples, Translation of Assignment Statements, Boolean expressions, Control Statements, Array references in Arithmetic expressions , Procedure Calls , Declarations and Case statements Translations.	10
UNIT 4	Symbol Tables: Data Structure for Symbol Tables, representing scope information. Run Time Administration: Implementation of simple Stack allocation scheme, storage allocation in block structured language.	4
UNIT 5	Error detection and Recovery: Lexical phase errors, syntax phase errors, semantic errors and Error recovery techniques.	4
UNIT 6	Code Optimization: Loop optimization, the DAG representation of basic blocks, value numbers and Algebraic Laws, Global Data – Flow Analysis and Code generation.	6
	TOTAL	42

REFERENCES

S.No.	Name of Books/Authors/Publishers	Year of Publication / Reprint
1	Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, “Compilers Principles, Techniques, & Tools”, 2 nd Edition, Pearson Addison Wesley.	2007