



**BR23 B.Tech CSE III YEAR II SEMESTER SYLLABUS**

III Year II Semester	COMPILER DESIGN (23CS6T01)	L	T	P	C
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**Course Objectives:**

Understand the basic concept of compiler design, and its different phases which will be helpful to construct new tools like LEX, YACC, etc.

**Course Outcomes:**

- CO1: Understand the phases and structure of a compiler.
- CO2: Design lexical analyzers and parsers.
- CO3: Implement syntax-directed translation and intermediate code generation.
- CO4: Apply optimization techniques to improve code performance.
- CO5: Develop code generation modules for target machines.

**UNIT I:**

**Lexical Analysis:** Language Processors, Structure of a Compiler, Lexical Analysis, The Role of the Lexical Analyzer, Bootstrapping, Input Buffering, Specification of Tokens, Recognition of Tokens, Lexical Analyzer Generator-LEX, Finite Automata, Regular Expressions and Finite Automata, Design of a Lexical Analyzer Generator.

**Syntax Analysis:** The Role of the Parser, Context-Free Grammars, Derivations, Parse Trees, Ambiguity, Left Recursion, Left Factoring,

**UNIT II:**

**Top Down Parsing:** Pre Processing Steps of Top Down Parsing, Backtracking, Recursive Descent Parsing, LL (1) Grammars, Non-recursive Predictive Parsing, Error Recovery in Predictive Parsing.

**Bottom Up Parsing:** Introduction, Difference between LR and LL Parsers, Types of LR Parsers, Shift Reduce Parsing, SLR Parsers, Construction of SLR Parsing Tables, More Powerful LR Parses, Construction of CLR (1) and LALR Parsing Tables, Dangling Else Ambiguity, Error Recovery in LR Parsing, Handling Ambiguity Grammar with LR Parsers.

**UNIT III:**

**Syntax Directed Translation:** Syntax-Directed Definitions, Evaluation Orders for SDD's, Applications of Syntax Directed Translation, Syntax-Directed Translation Schemes, Implementing

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## BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

(An AUTONOMOUS INSTITUTION, APPROVED BY AICTE-NEW DELHI, PERMANENTLY  
AFFILIATED TO JNTUK-KAKINADA, ACCREDITED BY NAAC 'A' GRADE,  
2 PROGRAMMES (CSE,EEE) ACCREDITED BY NBA ( For A.Y 2023-24 to 2025-26)  
Post Box: 26, Amalapuram 533201, Dr.B R Ambedkar Konaseema Dt., A.P.

L-Attributed SDD's. **Intermediate Code Generation:** Variants of Syntax Trees, Three Address Code, Types and Declarations, Translation of Expressions, Type Checking, Control Flow, Backpatching, Intermediate Code for Procedures.

### UNIT IV:

**Code Optimization:** The Principle Sources of Optimization, Basic Blocks, Optimization of Basic Blocks, Structure Preserving Transformations, Flow Graphs, Loop Optimization, Data-Flow Analysis, Peephole Optimization

### UNIT V:

**Run Time Environments:** Storage Organization, Run Time Storage Allocation, Activation Records, Procedure Calls, Displays

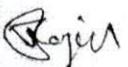
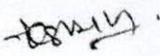
**Code Generation:** Issues in the Design of a Code Generator, Object Code Forms, Code Generation Algorithm, Register Allocation and Assignment.

Text Books:

1. Compilers: Principles, Techniques and Tools, Second Edition, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Pearson, 2007.

### Reference Books:

1. Compiler Construction, Principles and Practice, Kenneth C Louden, Cengage Learning, 2006
2. Modern compiler implementation in C, Andrew W Appel, Revised edition, Cambridge University Press.
3. Optimizing Compilers for Modern Architectures, Randy Allen, Ken Kennedy, Morgan Kaufmann, 2001.
4. Levine, J.R., T. Mason and D. Brown, Lex and Yacc, edition, O'Reilly & Associates, 1990

					
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