ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech. Scheme of Examination & Syllabus 2024-25

COMPUTER ENGINEERING

SEVENTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
CE701T	Compiler Construction	4	-	-	4	30	70	100

Course Objectives	Course Outcomes
This course is intended to Understand the fundamental theories behind compiler design Develop practical skills in implementing compiler phases using standard tools and languages Enhance compiler performance through systematic evaluation and optimization techniques	**Students will be able to** Understand how programs are translated and interpreted in software development Explore various phases of compiler for efficient programming. Discover how intermediate steps help simplify complex programming tasks Apply core computer science ideas like data structures and algorithms practically Acquire practical programming skills necessary for constructing a compiler

Unit I	**[08 Hrs]**
Introduction to Compiling and Lexical Analysis: Definition, Analysis of the source program, Phases of a compiler, Grouping of phases, Compiler Construction tools, A simple one-pass compiler, The role of the Lexical analyzer, Input buffering, Specification of Tokens, A Language for Specifying Lexical Analyzers	
Unit II	**[12 Hrs]**
Syntax Analysis: Role of the parser, Grammars, Context-Free Grammars, Top Down parsing, Recursive Descent Parsing, Predictive Parsing, Bottom-up parsing, Shift Reduce Parsing, Operator Precedent Parsing, LR Parsers, SLR Parser, Canonical LR Parser, LALR Parser ,YACC	
Unit III	**[10 Hrs]**
Intermediate Code Generation: Syntax Directed Definitions, Evaluation Orders for Syntax Directed Definitions, Intermediate Languages: Syntax Tree, Three Address Code, Types and Declarations, Translation of Expressions, Type Checking.	
Unit IV	**[08 Hrs]**
Code Generation: Issues in the Design of a Code Generator, Run-Time Storage Management, Basic Blocks and Flow Graphs, Next-Use Information, Simple Code Generator, Register allocation and Assignment, DAG Representation of Basic Blocks, Generating Code from DAGs, Code-Generation Algorithm, Code-Generators.	
Unit V	**[06 Hrs]**
Code Optimization: Principal Sources of Optimization, Peep-hole optimization, Optimization of Basic Blocks, Global Data Flow Analysis, Efficient Data Flow Algorithm.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Compilers: Principles, Techniques, and Tools	Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman	Second	Addison-Wesley
2	Introduction to Automata Theory, Languages, and Computation	John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman	Third	Pearson Publication

Reference Books

Chairman - BoS	Dean – Academics	September 2023 Date of Release	1 Version	Applicable for 2024-25

S.N	Title	Authors	Edition	Publisher
1	Engineering a Compiler	Keith D. Cooper	Second	Morgan Kaufmann
2	Compiler Writing	Paul G. Sorenson	-	McGraw-Hill Publication
3	Theory and Practice of Compiler Writing	Jean Paul Tremblay, Paul Gordon Sorenson	-	BS Publications
4	Writing Compilers and Interpreters: A Software Engineering Approach	Ronald Mak	Third	Wiley Publication