GAYATRI VIDYA PARISHAD COLLEGE FOR DEGREE AND P.G COURSES (A)
Affiliated to Andhra University | Reaccredited by NAAC | ISO 9001-2015
(PG-MBA and UG Engineering B.Tech. (CE, CSE, ECE and ME) Programs are Accredited by NBA
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Department of Computer Science and Engineering

1975704	COMPILER DESIGN	
Instruction: 3 Periods /week, External Exam: 3 Hours		Credits: 3
Internal: 30 Marks	External: 70 Marks	Total: 100 Marks

COURSE OBJECTIVES:

1. Learn about language processors, phases of compiler and Lexical Analyzer.
2. Learn about Syntax Analyzer and various types of parsers.
3. Learn about intermediate code generation.
4. Learn different code optimization techniques.
5. Learn symbol tables, run time environment, error handling, code generation and code scheduling.

COURSE OUTCOMES:

At the end of the course student will be able to

1. Describe the various phases of Compiler and generate tokens for the given program.
2. Explain the working of syntax analyzer and generate a parsing table to parse a string.
3. Construct intermediate code for the given parse tree.
4. Construct an Optimized Code for the given intermediate code using different techniques.
5. Understand the working of Code Generation, Code Scheduling, Symbol Tables, Run time Environment and Error Handling.

UNIT-I

Introduction Finite Automata & Lexical Analysis:: Introduction to Compilers and Language processors, , Programming Language basics, Structure & Different Phases of a Compiler, Review of Compiler Structure, Structure of Optimizing Compilation, Compiler construction tools, Boot strapping, Cross compilers, Introduction to Lexical Analysis, Lexical Analyzers, Approaches to design Lexical Analyzers, Language for specifying lexical analyzers, Introduction to Finite automata, Regular Expressions & Languages, Recognition of Tokens, Transition Diagrams, Implementation of lexical analyzers, Lexical Analyzer Generator LEX.

Head of the Department
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UNIT-III

Intermediate Code Generation: Intermediate Codes, Syntax Directed translation to Postfix code, Syntax Trees, Intermediate Code Generation, Three Address Code-Translation of Expressions, Type Checking& Type Conversions.

UNIT-IV

Code Optimization: Principal sources of Code Optimization, Loop Optimization, Basic Blocks & Flow Graphs, DAG Representation of Basic Blocks, Applications of DAG, Local Optimization, Unreachable Code Elimination, Dead Code Elimination, Data Flow Analysis, Data Flow Equations & Computations, Peep-Hole Optimization. Machine Dependent Optimizations, Overview of Informal Compiler Algorithm Notation(ICAN), If Simplification, Loop Simplification, Loop Inversion, Branch Optimization and Prediction.

UNIT-V

Code Generation, Code Scheduling, Symbol Tables, Run time Environment and Error Handling: Issues in Code Generation, Input to Code Generator, Instruction Selection, Register Allocation, Simple Target Machine Model, Program and Instruction Costs, Register allocation & Assignments, Code Generation Algorithm, Code Generators, Optimal Code Generation for Expressions, Code Generation From DAG, Contents of a Symbol Table, Data Structures for Symbol Tables, Run time Environments, Implementation of a simple Stack allocation, Heap Management, Block Structured Languages; Error Detection & Recovery, Lexical Phase Errors, Syntactic & Semantic Errors, Error Handling Routines.

Text Books:

1. Principles of Compiler Design by Aho,D. Ullman, Lam and Ravi Sethi, Pearson Education Second Edition
2. Advanced Compiler Design and Implementation, Steven Muchnic, Elsevier Publications.

References:

1. Compiler Construction by Kenneth. C. Louden, Vikas Pub.House.
2. Compiler Design, A.A. Pentambekar, Technical Publications
3. Modern Compiler Design, Grune.D, Van Reeuwijk K, Bal H.E, Jacobs C J H, Langendoen K, Springer

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