RSET
RAJAGIRI SCHOOL OF
ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

B. TECH.
IN
COMPUTER SCIENCE AND BUSINESS SYSTEMS

SEMESTER V
(2021 ADMISSIONS)

SYLLABUS

Rajagiri Valley, Kakkanad,
Kochi 682 039, Kerala, INDIA
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COURSE CODE	COURSE NAME	L	T	P	CREDIT	YEAR OF INTRODUCTION
101009/IT522S	COMPILER DESIGN LAB	0	0	4	2	2021

1. Preamble

This course is intended to provide a hands-on experience on implementing the different phases of compiler, implementing and testing simple optimization techniques and to give exposure to compiler writing tools.

2. Prerequisite

Basic Programming in Python, Data Structures

3. Syllabus

1. Design and implement a lexical analyzer for given language using C and the lexical analyzer should ignore redundant spaces, tabs and new lines.
2. Implementation of Lexical Analyzer using Lex Tool
3. Generate YACC specification for a few syntactic categories.
   a) Program to recognize a valid arithmetic expression that uses operator +, – , * and /.
   b) Program to recognize a valid variable which starts with a letter followed by any number of letters or digits.
   c) Implementation of Calculator using LEX and YACC
   d) Convert the BNF rules into YACC form and write code to generate abstract syntax tree
4. Write a program to find ε – closure of all states of any given NFA with ε transition.
5. Write a program to convert NFA with ε transition to NFA without ε transition.
6. Write a program to convert NFA to DFA
7. Write a program to minimize any given DFA.
8. Develop an operator precedence parser for a given language.
9. Write a program to find Simulate First and Follow of any given grammar.
10. Construct a recursive descent parser for an expression.
11. Construct a Shift Reduce Parser for a given language.
12. Write a program to perform loop unrolling.
13. Write a program to perform constant propagation.
14. Implement Intermediate code generation for simple expressions.
15. Implement the back end of the compiler which takes the three-address code and produces the 8086 assembly language instructions that can be assembled and

run using an 8086 assembler. The target assembly instructions can be simple move, add, sub, jump etc.

4. Text Books

1. V. Aho, R. Sethi and J. Ullman, *Compilers: Principles, Techniques and Tools*, 2nd Edition, Addison Wesley, 2006.
2. Levine R. John, Tony Mason and Doug Brown, *Lex & Yacc*, 2nd Edition, O'Reilly Media, Inc., 1992.

5. Reference Books

1. Bjarne Stroustrup, *The Design and Evolution of C++*, 1st Edition, Addison-Wesley Professional, 1994.
2. Kenneth C. Louden, *Compiler Construction – Principles and Practice*, Cengage Learning Indian Edition, 2006.
3. Tremblay and Sorenson, *The Theory and Practice of Compiler Writing*, Tata McGraw Hill & Company,1984.
4. Randy Allen, Ken Kennedy, *Optimizing Compilers for Modern Architectures: A Dependence-based Approach*, Morgan Kaufmann Publishers, 2008.
5. Steven S. Muchnick, *Advanced Compiler Design and Implementation*, Morgan Kaufmann Publishers – Elsevier Science, India, Indian Reprint 2008.

6. Course Outcomes

After the completion of the course the student will be able to

CO1: Implement the techniques of Lexical Analysis and Syntax Analysis.

CO2: Apply the knowledge of Lex & Yacc tools to develop programs.

CO3: Generate intermediate code.

CO4: Implement Optimization techniques and generate machine level code.

CO5: Understand and analyze the role of syntax and semantics of programming languages in compiler construction

7. Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	2	-	-	-	1	1	1	1
CO2	3	2	3	2	2	-	-	-	2	1	1	1
CO3	3	2	3	2	2	-	-	-	-	-	-	2
CO4	3	2	3	2	2	-	-	-	-	-	-	-
CO5	3	2	3	2	2	-	-	-	1	1	1	2

8. Mark Distribution

Total Marks	Continuous Internal Evaluation (CIE)	End Semester Examination (ESE)	ESE duration
150	75	75	3 hours

Continuous Internal Evaluation Pattern:
Attendance : 15 marks
Continuous Assessment : 30 marks
Internal Test (Immediately before the second series test) : 30 marks

9. End Semester Examination Pattern

The following guidelines should be followed regarding award of marks:
(a) Preliminary work : 15 Marks
(b) Implementing the work/Conducting the experiment : 10 Marks
(c) Performance, result and inference : 25 Marks
(d) Viva voce : 20 marks
(e) Record : 5 Marks

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