

DEPARTMENT OF COMPUTER SCIENCE AND ENGG

COURSE PLAN

Department : COMPUTER SCIENCE AND ENGG
 Subject : (CSE 302) Language Processors
 Semester & branch : VI B.E. CSE
 Name of the faculty : Dr. Ashalatha Nayak
 Ms. Deepthi. S.
 Mr. Shyam Karanth
 Ms. Ancilla Pinto

No of contact hours/week : 4

Assignment portion	
Assignment no.	Topics
1	L1-L9
2	L10-L18
3	L19-L27
4	L28-L36
5	L37-L48
Test portion	
Test no.	Topics
1	L1-L20
2	L21-L40

Submitted by:

Dr. Ashalatha Nayak

Approved by:

(Signature of HOD)

Date:

Lecture no.	Topic to be covered
1	INTRODUCTION: Language processors, Lexical analysis, Syntax and Semantic analysis
2	Intermediate Code Generation, Code Optimization, Code Generation
3	Symbol Table Management, Grouping of phases into passes, Compiler Construction Tools
4	LEXICAL ANALYSIS: Lexical Analysis Vs Parsing, Tokens, Patterns and Lexemes, Attributes for Tokens, Lexical errors.
5	Input Buffering- Buffer pairs and Sentinels
6	Specification of tokens: Strings and languages, Operation on languages, Regular Expression and definitions.
7	Transition diagrams, Recognition of reserved words and identifiers, Architecture of transition based lexical analyser.
8	NFA, Transition Tables, Automata, DFA.
9	NFA to DFA, Simulation of NFA, Construction of NFA from Regular Expression
10	The structure of the generated analyser, Pattern matching based on NFA's, DFA for lexical analyser, Implementation of Lookahead operator.
11	SYNTAX ANALYSIS: Role of parser, Representative grammars, Syntax Error handling , Error recovery strategies.
12	CFG and notations, derivations, Parse trees and derivations, Ambiguity, Verification of language, CFG Vs Regular Expression.
13	Lexical Vs Syntactic Analysis, Eliminating Ambiguity and left recursion, left factoring, Non context free language constructs.
14	Problems based on left recursion and left factoring
15	Top Down parsing: FIRST and FOLLOW, LL(1) grammar, Nonrecursive predictive parsing, Error Recovery in Predictive parsing.
16	Problems on FIRST, FOLLOW, LL(1) grammar and Parsing.
17	Bottom Up parsing: Reductions, handle pruning, Shift reduce parsing.
18	Problems on Shift Reduce parsing.

19	LR parsing, Items and LR(0) Automaton, LR-parsing algorithm, Construction of SLR-Parsing tables, Viable prefixes.
20	Problems on LR parsing.
21	Canonical LR(1) items, LR(1) sets of items, Canonical LR(1) Parsing tables, Constructing LALR Parsing tables, Efficient construction of LALR parsing tables Compaction of LR parsing tables
22	Problems on LALR parsing.
23	Using ambiguous grammar: Precedence and Associativity to resolve conflicts, Dangling-Else Ambiguity, Error recovery in LR parsing
24	SYNTAX DIRECTED TRANSLATION: Inherited and Synthesized Attributes.
25	Evaluating an SDD at nodes of a parse tree.
26	Application of SDT: Construction of Syntax trees.
27	INTERMEDIATE CODE GENERATION: Variants of syntax trees, DAG for expressions,
28	Value-Number method for DAG construction.
29	Three Address code
30	Type Expressions and Type Equivalence.
31	Operations with expressions
32	Rules for Type Checking
33	RUN TIME ENVIRONMENTS: Static Vs Dynamic Storage Allocation.
34	Stack Allocation of Space: Activation Trees, Activation Records
35	Calling sequences
36	Variable length data on stack.
37	CODE GENERATION: Input to code generator, target program, Instruction selection.
38	Register Allocation, Evaluation order.

39	Target machine model, Program and instruction costs.
40	Static Allocation, Stack allocation, Run-Time Addresses for Names.
41	Basic blocks, Next-Use Information.
42	Flow Graphs, Representation of flow graphs, Loops.
43	ASSEMBLERS: Elements of Language Programming
44	Assembly scheme
45	Pass structure of Assemblers
46	Design of two pass assemblers.
47	Use of Lex, Structure of Lex programs, Conflict resolution in Lex, Lookahead operators
48	Parser generator Yacc, using Yacc with ambiguous grammars, creating Yacc Lexical Analysers with Lex, Error recovery in Yacc.

References:

1. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, "Compilers Principles, Techniques and Tools", Pearson Education, 2nd edition. 2010
2. D M Dhamdhere, "Systems Programming and Operating Systems", Tata McGraw Hill, 2nd Revised Edition, 2001.
3. Kenneth C. Louden, "Compiler Construction - Principles and Practice", Thomson, India Edition, 2007.