MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

COURSE PLAN

Department	:	Computer Science and Engineering
Course Name & code	:	Advanced System Software & CSE 5251
Semester & branch	:	II M.Tech. & CSE
Name of the faculty	:	Dr. Narendra V G

No of contact hours/week:

L	T	P	C
36	12	0	04

Course Outcomes (COs)

	At the end of this course, the student should be able to:	No. of Contact Hours	Marks
CO1:	Understand the basic structure of a compiler and the role of the lexical analyser.	05	10
CO2:	Understand different parsing techniques and the associated challenges involved.	12	26
CO3:	Become familiar with techniques for translation of languages, generation of intermediate code and generation of target code.	11	22
CO4:	Become aware of the various architectures of distributed systems and the mechanisms of coordination between the different systems.	08	16
CO5:	Study about mechanisms of replication & maintaining consistency and different techniques of tolerating & recovering from faults.	12	26
	Total	48	100

Assessment Plan

Components	Assignments	Sessional Tests	End Semester/ Make-up Examination
Duration	20 to 30 minutes	60 minutes	180 minutes
Weightage	20 % (4 X 5 marks)	30 % (2 X 15 Marks)	50 % (1 X 50 Marks)
Typology of Questions	Understanding; Applying; Analyzing; Evaluating; Creating	Remembering; Understanding; Applying	Understanding; Applying; Analyzing; Evaluating; Creating
Pattern	Answer one randomly selected question from the problem sheet (Students can refer their class notes)	MCQ (10 marks): 10 questions of 0.5 marks each Short Answers (10 marks): questions of 2 or 3 marks	Answer all 5 full questions of 10 marks each. Each question may have 2 to 3 parts of 3/4/5/6/7 marks
Schedule	As notified by Associate Director (Academics) at the start of each semester	Calendared activity	Calendared activity
Topics Covered	Assignment 1 (L 0-6 & T 1-2) **(CO1,CO2)**	Test 1 (L 0-14 & T 1-5) **(CO1, CO2, CO3)**	Comprehensive examination covering full syllabus. Students are expected to answer all questions **(CO1-5)**
	Assignment 2 (L **7-14** & T 3-4) **(CO2, CO3)**		
	Assignment 3 (L 15-21 & T 5-7) **(CO3, CO4)**	Test 2 (L 15-29 & T 6-8) **(CO3, CO4, CO5)**	
	Assignment 4 (L 22-29 & T 7-8) **(CO4, CO5)**		

Lesson Plan

L. No.	Topics	Course Outcome Addressed
L0	1.INTRODUCTION: Language Processors, The Structure of a Compiler- Lexical Analysis, Syntax Analysis, Semantic Analysis, Intermediate Code Generation, Code Optimization	CO1
L1	Symbol-Table Management, The Grouping of Phases into Passes.	CO1
L2	2. LEXICAL ANALYSIS: Role of the Lexical Analyzer, Input Buffering	CO1
T1	Recognition of Tokens, Problems	CO1
L3	Design of Lexical Analyzer Generator	CO1
L4	SYNTAX ANALYSIS: Introduction, The Role of the Parser	CO2
L5	Representative Grammars, Syntax Error Handling, Error-Recovery Strategies	CO2
T2	Writing a Grammar, Problems,Lexical Versus Syntactic Analysis	CO2
L6	Eliminating Ambiguity, Elimination of Left Recursion	CO2

L7	Left Factoring, Problems	CO2
L8	Non-Context-Free Language Constructs, Problems	CO2
T3	Problems on Grammar	CO2
L9	Top-Down Parsing, Recursive-Descent Parsing, Problems	CO2
L10	FIRST and FOLLOW	CO2
L11	LL(1) Grammars, Problems	CO2
T4	Nonrecursive Predictive Parsing, Problems	CO2
L12	Error Recovery in Predictive Parsing	CO2
L13	SYNTAX DIRECTED TRANSLATION:Syntax Directed Definitions, Inherited and Synthesized Attributes, Evaluating an SDD at the Nodes of a Parse Tree, Evaluation order for SDD's	CO3
L14	Evaluation order for SDD's, Dependency Graphs, Ordering the Evaluation of Attributes	CO3
T5	S-Attributed Definitions, L-Attributed Definitions, Semantic Rules with Controlled Side Effect, Problems	CO3
L15	Applications of Synt ax-Directed Translation	CO3
L16	5. INTERMEDIATE CODE GENERATION: Variants of Syntax Trees	CO3
L17	Three Address Code	CO3
T6	Type and Declarations, Problems	CO3
L18	Translation of Expressions	CO3
L19	6.CODE GENERATION: Issues in Design of Code Generator	CO3
L20	The Target Language	CO3
T7	Basic Blocks and Flow Graphs, Problems	CO3
L21	7.DISTRIBUTED SYSTEM ARCHITECTURE: What is a distributed system? Design goals, Types of distributed systems	CO4
L22	Architectural styles, Middleware organization	CO4
L23	System architectures, Example architectures.	CO4
T8	8.COORDINATION: Clock synchronization	CO4
L24	Logical clocks	CO4
L25	Mutual exclusion, Election Algorithms	CO4
L26	Location systems, Distributed event matching	CO4
T9	Gossip-based coordination, Problems	CO4
L27	9.CONSISTENCY AND REPLICATION: Introduction, Data-centric consistency models	CO5
L28	Client-centric consistency models	CO5

L29	Replica management	CO5
T10	Consistency protocols, Problems	CO5
L30	Example: Cache replication in the web.	CO5
L31	10.FAULT TOLERANCE: Introduction, Process resilience	CO5
L32	Reliable client-server communication	CO5
T11	Reliable group communication	CO5
L33	Distributed commit	CO5
L34	Recovery	CO5
L35	Problems	CO5
T12	Problems (Contd…)	CO5
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L/T	Click or tap here to enter text.	

References:

1. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, “Compilers Principles, Techniques and Tools”, (2e), Pearson Education, 2010.
2. Andrew S. Tannenbaum, Maarteen Van Steen: “Distributed Systems, Principles and Paradigms”, (3e), Version 3.01, 2017.
3. Kenneth C. Louden, “Compiler Construction - Principles and Practice”, (1e), Thomson, 2007.
4. George Coulouris, Jean Dollimore, Tim Kindberg, “Distributed Systems, Concepts and Design”, (4e), Pearson Education, 2009.
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Submitted by: **DR. NARENDRA V G**

(Signature of the faculty)

Date: 12-01-2020

Approved by: DR. ASHALATHA NAYAK HOD CSE

(Signature of HOD)

Date: 12-01-2020

FACULTY MEMBERS TEACHING THE COURSE (IF MULTIPLE SECTIONS EXIST):

FACULTY	SECTION	FACULTY	SECTION
Dr. Narendra V G			

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