UE18CS351: Compiler Design (4-0-0-4-4)

# of Hrs: 56

Class #	Chapter Title / Reference Literature	Topics to be Covered	% of portions covered	
			Reference Chapter	Cumulative
UNIT 1: I Compilers (10 hours)				
1	**T1 Ch 1, 1.1-1.2 and Ch 3, 3.1-3.5**	Introduction, Language Processing System	17.86%	17.86%
2		Structure of a Compiler, Grouping of phases into passes		
3				
4		Role of the Lexical Analyser		
5		Input Buffering		
6				
7		Specification of Tokens		
8		Recognition of Tokens		
9				
10		Lexical Analyser Generator		
UNIT 2 Syntax Analysis (12 hours)				
11	**T1 Ch 4, 4.1.1,4.1.3-4.1.4, 4.2-4.3, 4.4.1-4.4.6, 4.5, 4.6, 4.7**	The role of the parser	21.43%	39.29%
12		CFG, Ambiguity, Eliminating Left Recursion, Left Factoring		
13		Syntax Error Handling, Error-Recovery Strategies.		
14		Top-down parsing: Recursive Descent Parser (RDP) with Backtracking		
15		LL(1) Parser		
16				
17		Bottom-up parsing Introduction, Shift-Reduce Parsing		
18		LR (0)		
19		SLR		
20		LR(0) AND SLR : MORE EXAMPLES		
21		CLR, LALR		
22				
UNIT 3: Syntax-Directed Translation (12 Hours)				
23	T1 **ch 5, 5.1-5.3, 5.4.1-5.4.4, 5.5**	Syntax-directed definitions	21.43%	60.72%
24		Evaluation orders for SDD's,		
25				
26				
27		Applications of Syntax-Directed Translation		
28		Syntax-directed Translation Schemes – Postfix Translation Schemes.		
29		Parser Stack Implementation: Parser Stack Implementation of Postfix SDT's,		
30				
31		SDT's with actions inside Productions		
32		SDT's for L-Attributed Definitions		
33		Implementing L-Attributed SDD's: Bottom-Up Parsing		
34				
UNIT 4 : Intermediate-Code Generation (12 Hours)				
35	T1	Variants of Syntax Trees – Directed Acyclic Graphs for Expressions	21.43%	82.15%
36				

37	Ch 6, 6.1-6.2, ch 8, 8.4 : 8.4.1-8.4.6, ch 8, 8.5, Ch 9, 9.1-9.2	Three-Address Code – Addresses and Instructions, Quadruples, Triples, Indirect Triples, SSA Form,		
38		Control Flow Graph.		
39				
40		Optimization of Basic Blocks.		
41				
42		Machine Independent Optimization: Different Optimizations,		
43				
44				
45		Next-use algorithm.		
46		Data Flow Analysis: Live-variable analysis		
UNIT 5 : Run-Time Environments (10 Hours)				
47	**T1 ch 7, 7.1-7.3 ch 8, 8.1-8.3, 8.6**	Storage Organization, Different Allocation Strategies, Stack Allocation of space, Access to Non local Data on the stack.	17.85%	100%
48				
49				
50		Code Generation: Issues in the design of a code generator		
51				
52		Target language		
53		Addresses in the target code, static allocation, stack allocation, run-time addresses for names		
54				
55		A Simple Code generator - The Code generation algorithm		
56				

Literature:

Book Type	Code	Title & Author	Publication Info		
			Edition	Publisher	Year
Text Book	T1	Compilers–Principles, Techniques and Tools Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffery D. Ullman	2nd	Pearson Education	2009
Reference Book	R1	"Modern Compiler Design", Dick Grune, Kees van Reeuwijk, Henri E. Bal, Ceriel J.H. Jacobs, Koen Langendoen,	2nd	Pearson Education	2012

EVALUATION COMPONENT DETAILS:

ISA1 : 21
ISA2 : 14
ASSIGNMENT(i.e. PROJECT) : 15
ESA : 50