Semester: 3<sup>rd</sup>

Course Title: Compiler Design

Course Code: CSC3036

Class	Unit	Topics
Class 1	Unit I: Introduction	What is Compiler?, Phases of Compiler
Class 2	Unit I: Introduction	Overview of working of a compiler
Class 3	Unit III: Syntax Analysis	Grammar representation, Derivation and parse tree
Class 4	Unit III: Syntax Analysis	Ambiguity and Possible elimination
Class 5	Unit III: Syntax Analysis	Top Down Parsing
Class 6	Unit III: Syntax Analysis	Recursive Descent and Predictive top down parsing
Class 7	Unit III: Syntax Analysis	Elimination of left recursion, Adopting Translation scheme by applying left recursion
Class 8	Unit III: Syntax Analysis	Left recursion elimination technique in productions containing semantic actions
Class 9	Unit II: Lexical Analysis	Regular expression, Regular Definitions
Class 10	Unit II: Lexical Analysis	Extensions of regular expressions
Class 11	Unit II: Lexical Analysis	Recognition of tokens
Class 12	Unit II: Lexical Analysis	Structure of Lex program
Class13	Unit II: Lexical Analysis	NFA, DFA, Conversion from NFA to DFA
Class 14	Unit II: Lexical Analysis	Conversion from NFA with null transition into NFA without null transition

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Class	Unit	Topics
Class 15	Unit II: Lexical Analysis	Conversion from NFA with null transition into DFA
Class 16	Unit II: Lexical Analysis	Minimization of DFA
Class 17	Unit III: Syntax Analysis	Example of elimination of left recursion, left factoring, left factoring for dangling else grammar
Class 18	Unit III: Syntax Analysis	FIRST and FOLLOW of a grammar G
Class 19	Unit III: Syntax Analysis	LL(1) grammar, Construction of predictive parsing table for LL(1) grammar
Class 20	Unit III: Syntax Analysis	Parsing table for Dangling-else problem (non-LL(1) grammar)
Class 21	Unit III: Syntax Analysis	Moves of a predictive parser on an input
Class 22	Unit III: Syntax Analysis	Error recovery in predictive parser
Class 23	Unit III: Syntax Analysis	Bottom up parsing, Reductions, Handle Pruning
Class 24	Unit III: Syntax Analysis	Shift Reduce Parsing, Conflicts during Shift Reduce Parsing
Class 25	Unit III: Syntax Analysis	LR(0) Automaton
Class 26	Unit III: Syntax Analysis	Construction of LR(0) parsing table
Class 27	Unit III: Syntax Analysis	Construction of SLR Parsing table
Class 28	Unit III: Syntax Analysis	Canonical-LR

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Class 29	Class	Unit	Topics
Class 30 Class 31 Class 32 Class 32 Class 32 Class 33 Class 34 Class 35 Class 36 Class 37 Class 37 Class 37 Class 38 Class 38 Class 38 Class 39 Class 40 Class 40 Class 40 Class 40 Class 41 Class 41 Class 41 Class 42 Class 42 Class 42 Class 42 Class 42 Class 44 Class 45 Class 46 Class 47 Class 40 Class 41 Class 41 Class 42 Class 42 Class 42 Class 44 Class 44 Class 44 Class 45 Class 46 Class 47 Class 48 Cla	Class 29	Unit III:	•
Class 30 Class 31 Class 32 Class 32 Class 32 Class 33 Class 34 Class 35 Class 36 Class 37 Class 37 Class 37 Class 38 Class 38 Class 39 Class 40 Class 39 Class 40 Class 41 Class 41 Class 42 Class 43 Class 44 Class 44 Class 45 Class 46 Class 47 Class 48 Cla		Syntax	LALR parser
Class 30 Syntax Analysis  Class 31 Syntax Analysis  Class 32 Unit III: Syntax Analysis  Class 32 Unit IV: Code generation  Class 35 Unit IV: Code generation  Class 36 Unit IV: Code generation  Class 37 Unit IV: Code generation  Class 38 Unit IV: Code generation  Class 39 Unit IV: Code generation  Class 30 Unit IV: Code generation  Class 40 Unit IV: Code generation  Class 40 Unit IV: Code generation  Class 40 Unit IV: Code generation  Class 41 Unit IV: Code generation  Class 40 Unit IV: Code generation		Analysis	
Class 31	Class 20		
Class 31     Unit III: Syntax Analysis     Yacc       Class 32     Unit III: Syntax Analysis     Yacc       Class 33     Unit IV: Code generation     Symbol table contents       Class 34     Unit IV: Code generation     Type checking generation       Class 35     Unit IV: Code generation     Syntax directed translation       Class 36     Unit IV: Code generation     Forms of intermediate codes, Abstract Syntax Trees       Class 37     Unit IV: Code generation     Directed Acyclic Graph generation       Class 38     Unit IV: Code generation     Three address code generation generation       Class 39     Unit IV: Code generation     Intermediate code generation for different language constructs like arrays generation       Class 40     Unit IV: Code generation     Intermediate code generation for different language constructs like boolean expressions generation       Class 40     Unit IV: Code generation     Intermediate code generation for different language constructs like if, ifelse, while, case or switch, function call       Class 41     Unit V: Code generation     Intermediate code generation for different language constructs like if, ifelse, while, case or switch, function call	Class 50		Dangling -Else Ambiguity
Class 31		-	
Class 32			
Class 32 Unit III: Syntax Analysis  Class 33 Unit IV: Code generation  Class 34 Unit IV: Code generation  Class 35 Unit IV: Code generation  Class 36 Unit IV: Code generation  Class 37 Code generation  Class 38 Unit IV: Code generation  Unit IV: Code generation  Class 36 Unit IV: Code generation  Unit IV: Code generation  Class 37 Code generation  Class 38 Unit IV: Code generation  Unit IV: Code generation  Unit IV: Code generation  Class 38 Unit IV: Code generation  Basic blocks	Class 31		Yacc
Class 32 Syntax Analysis  Class 33 Unit IV: Code generation  Class 34 Unit IV: Code generation  Class 35 Unit IV: Code generation  Class 36 Unit IV: Code generation  Class 37 Code generation  Class 38 Unit IV: Code generation  Class 39 Unit IV: Code generation  Class 30 Unit IV: Code generation  Class 30 Unit IV: Code generation  Class 31 Unit IV: Code generation  Class 32 Unit IV: Code generation  Class 33 Unit IV: Code generation  Class 34 Unit IV: Code generation  Class 35 Unit IV: Code generation  Class 36 Unit IV: Code generation  Class 38 Unit IV: Code generation  Class 39 Unit IV: Code generation  Class 40 Unit IV: Code generation  Unit IV: Code generation  Class 40 Unit IV: Code generation  Unit IV: Code generation  Class 40 Unit IV: Code generation  Unit IV: Code generation  Class 40 Unit IV: Code generation  Class 40 Unit IV: Code generation  Unit IV: Code generation  Unit IV: Code generation  Class 40 Unit IV: Code generation			
Class 34	Class 32		
Class 33 Class 34 Class 35 Class 36 Class 37 Class 37 Class 38 Class 38 Class 39 Class 39 Class 39 Class 39 Class 39 Class 30 Class 30 Class 39 Class 40 Class 40 Class 40 Class 40 Class 40 Class 41 Class 41 Class 42 Class 48 Class 49 Class 40 Class 41 Class 41 Class 42 Class 42 Class 41 Class 42 Class 48 Cla	01435 32		Yacc
Class 34 Code generation  Class 34 Unit IV: Code generation  Class 35 Unit IV: Code generation  Class 36 Code generation  Unit IV: Code generation  Basic blocks		•	
Class 34 Unit IV: Code generation  Class 35 Unit IV: Code generation  Class 36 Unit IV: Code generation  Class 37 Code generation  Unit IV: Code generation  Class 37 Code generation  Unit IV: Code generation  Basic blocks	Class 33		
Class 34 Unit IV: Code generation  Class 35 Unit IV: Code generation  Class 36 Unit IV: Code generation  Basic blocks			Symbol table contents
Class 34 Code generation  Class 35 Class 35 Class 36 Class 36 Class 36 Class 37 Code generation  Unit IV: Class 37 Code generation  Unit IV: Class 38 Code generation  Unit IV: Class 39 Code generation  Unit IV: Code generation  Basic blocks			
Class 35 Class 36 Class 37 Class 38 Class 38 Class 38 Class 38 Class 39 Class 39 Class 40 Class 40 Class 41 Class 41 Class 42 Class 45 Class 46 Class 46 Class 47 Class 47 Class 48 Cla	Class 34		
Class 35 Class 36 Class 36 Class 37 Class 37 Class 38 Class 39 Class 40 Class 40 Class 40 Class 41 Class 41 Class 42 Class 42 Class 42 Class 42 Class 42 Class 40 Class 41 Class 41 Class 42 Class 42 Class 44 Class 45 Class 46 Class 47 Class 48 Class 48 Class 48 Class 48 Class 49 Class 40 Class 41 Class 41 Class 42 Class 42 Class 43 Class 44 Class 45 Class 46 Class 47 Class 48 Class 49 Class 49 Class 40 Class 41 Class 41 Class 41 Class 42 Class 42 Class 42 Class 43 Class 44 Class 44 Class 45 Class 46 Class 47 Class 48 Cla			Type checking
Class 35 Code generation  Unit IV: Class 36 Class 37 Class 38 Class 39 Class 39 Class 40 Class 40 Class 41 Class 41 Class 42 Class 46 Class 46 Class 47 Class 47 Class 48 Class 49 Class 49 Class 40 Class 41 Class 40 Clas		_	
Class 36  Class 37  Class 38  Class 39  Class 39  Class 39  Class 39  Class 40  Class 40  Class 41  Class 41  Class 42  Class 42  Class 42  Class 42  Class 42  Class 40  Class 41  Class 41  Class 42  Class 42  Class 43  Class 44  Class 45  Class 46  Class 47  Class 48  Class 48  Class 49  Class 40  Class 40  Class 40  Class 40  Class 40  Class 41  Class 41  Class 41  Class 42  Class 42  Class 41  Class 42  Class 43  Class 44  Class 45  Class 46  Class 47  Class 47  Class 48  Class 48  Class 49  Class 40  Class 40  Class 40  Class 41  Class 41  Class 41  Class 42  Class 41  Class 42  Class 41  Class 41  Class 42  Class 43  Class 43  Class 44  Class 44  Class 45  Class 46  Class 47  Class 47  Class 48  Class	Class 35		
Class 36 Class 37 Class 37 Class 38 Class 39 Class 40 Class 40 Class 40 Class 40 Class 41 Class 41 Class 42 Class 42 Class 42 Class 42 Class 42 Class 40 Class 41 Class 40 Class 41 Class 41 Class 41 Class 42 Class 41 Class 42 Class 43 Class 43 Class 44 Class 44 Class 45 Class 46 Class 47 Class 48 Cla			Syntax directed translation
Class 36       Code generation       Forms of intermediate codes, Abstract Syntax Trees         Class 37       Unit IV: Code generation       Directed Acyclic Graph         Class 38       Unit IV: Code generation       Three address code         Class 39       Unit IV: Code generation       Intermediate code generation for different language constructs like arrays         Class 40       Unit IV: Code generation       Intermediate code generation for different language constructs like boolean expressions         Class 41       Unit IV: Code generation       Intermediate code generation for different language constructs like if, ifelse, while, case or switch, function call         Class 42       Unit V: Code       Basic blocks			
Class 36 generation  Unit IV: Code generation  Unit IV: Class 38 Code generation  Unit IV: Code generation  Unit IV: Code generation  Unit IV: Code generation  Class 40 Unit IV: Code generation  Class 41 Unit IV: Code generation  Unit IV: Code generation  Unit IV: Code generation  Intermediate code generation for different language constructs like arrays  Intermediate code generation for different language constructs like boolean expressions or switch, function call  Class 42 Unit V: Code Generation  Directed Acyclic Graph  Three address code generation for different language constructs like arrays  Intermediate code generation for different language constructs like if, ifelse, while, case or switch, function call  Basic blocks			Forms of intermediate codes, Abstract Syntax Trees
Class 37     Unit IV: Code generation     Directed Acyclic Graph       Class 38     Unit IV: Code generation     Three address code       Class 39     Unit IV: Code generation     Three address code       Class 40     Unit IV: Code generation     Intermediate code generation for different language constructs like arrays       Class 41     Unit IV: Code generation     Intermediate code generation for different language constructs like boolean expressions or switch, function call       Class 42     Unit V: Code     Three address code       Basic blocks	Class 36		
Class 37     Code generation     Directed Acyclic Graph       Class 38     Unit IV: Code generation     Three address code generation       Class 39     Unit IV: Code generation     Intermediate code generation for different language constructs like arrays       Class 40     Unit IV: Code generation     Intermediate code generation for different language constructs like boolean expressions       Class 41     Unit IV: Code generation     Intermediate code generation for different language constructs like if, ifelse, while, case or switch, function call       Class 42     Unit V: Code generation     Basic blocks			
Class 37 generation  Unit IV: Code generation  Unit IV: Code generation  Class 39 Class 40 Class 40 Class 41 Class 41 Class 42 Class 42 Class 42 Class 42 Class 45 Class 46 Class 47 Class 46 Class 47 Class 47 Class 48 Cl			Directed Acyclic Comb
Class 38  Class 39  Class 40  Class 41  Class 41  Class 42  Class 42  Class 42  Class 48  Class 48  Class 49  Class 49  Class 40  Class 41  Class 41  Class 41  Class 42  Class 42  Class 42  Class 45  Class 46  Class 47  Class 48  Class 48  Class 48  Class 49  Class 49  Class 40  Class 40  Class 40  Class 40  Class 41  Class 41  Class 42  Class 42  Class 43  Class 44  Class 45  Class 46  Class 47  Class 48  Class 48  Class 48  Class 49  Class 40  Class 40  Class 40  Class 41  Class 41  Class 42  Class 41  Class 42  Class 42  Class 43  Class 44  Class 45  Class 46  Class 47  Class 48  Class 48  Class 48  Class 49  Class 49  Class 40  Class 40  Class 40  Class 41  Class 41  Class 42  Class 42  Class 43  Class 44  Class 45  Class 46  Class 47  Class 48  Class	Class 37		Directed Acyclic Graph
Class 38Code generationThree address codeClass 39Unit IV: Code generationIntermediate code generation for different language constructs like arraysClass 40Unit IV: Code generationIntermediate code generation for different language constructs like boolean expressionsClass 41Unit IV: Code generationIntermediate code generation for different language constructs like if, ifelse, while, case or switch, function callClass 42Unit V: Code GodeUnit V: CodeBasic blocks			
Class 38 generation  Unit IV: Code generation  Class 40 Unit IV: Code generation  Unit IV: Code generation  Class 41 Unit IV: Code generation  Class 41 Unit V: Code generation  Class 42 Unit V: Code Basic blocks			Three address code
Unit IV:       Code generation         Class 40       Unit IV:       Code generation         Class 40       Unit IV:       Code generation         Class 41       Unit IV:       Code generation         Class 41       Unit IV:       Code generation         Class 42       Unit V:       Code         Class 42       Unit V:       Code         Class 42       Unit V:       Basic blocks	Class 38		Thice address code
Class 39       Code generation       Intermediate code generation for different language constructs like arrays         Class 40       Unit IV: Code generation       Intermediate code generation for different language constructs like boolean expressions         Class 41       Unit IV: Code generation       Intermediate code generation for different language constructs like if, ifelse, while, case or switch, function call         Class 42       Unit V: Code       Basic blocks		_	
Class 40			Intermediate code generation for different language constructs like arrays
Class 40 Unit IV: Code generation  Unit IV: Code generation  Class 41 Unit IV: Code generation  Class 42 Unit V: Code generation  Class 42 Unit V: Code generation  Class 42 Basic blocks	Class 39		intermediate code generation for different language constructs like arrays
Class 40 Code generation  Unit IV: Code generation  Class 41  Unit V: Code generation  Class 42  Class 42  Class 42  Code Generation  Code generation  District Intermediate code generation for different language constructs like if, ifelse, while, case or switch, function call  Basic blocks			
generation     Unit IV:     Unit IV:     Intermediate code generation for different language constructs like if, ifelse, while, case or switch, function call       Class 42     Unit V:     Code     Basic blocks	Class 40		Intermediate code generation for different language constructs like boolean expression
Class 41 Unit IV: Code generation  Class 42 Unit V: Code Generation  Class 42 Unit V: Code Basic blocks  Unit V: Code  Class 42 Code  Class 42 Unit V: Code Code Code Code Code Code Code Code			
Class 41  Class 42  Code generation  Class 42  Class 42  Code generation  Code generation  Code generation  Code generation  Class 42  Code Basic blocks		_	
Class 41 generation or switch, function call  Class 42 Unit V: Code Basic blocks	Class 41		
Class 42 Unit V: Code Basic blocks			
Class 42 Code Basic blocks	Class 42		Basic blocks
Optimisation		Optimisation	

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Class	Unit	Topics
Class 43	Unit V:	
Class 43	Code	Common sub-expression elimination
	Optimisation	
Class 44	Unit V:	
Class 44	Code	Variable propagation
	Optimisation	
Class 45	Unit V:	
Class 43	Code	Code motion
	Optimisation	
	Unit V:	
Class 46	Code	Strength reduction, Elimination of dead code
Class 40	Optimisation	
	Unit V:	
Class 47	Code	Loop optimization
	Optimisation	

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