CS301: Compiler Design	L	T	P	Theory of Computation
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Course Objective: To study the various stages of compiler designing.

S. No.	Course Outcomes (CO)
CO1	Explain the fundamental concepts of compiler design, including the phases like lexical analysis, syntax analysis, and the role of finite state machines (FSM) and regular expressions in lexical analysis.
CO2	Implement lexical analyzers using tools like Lex and apply formal grammar techniques such as BNF, CFG, and various parsing methods like LR, SLR, and LALR parsers, utilizing parser generators like YACC.
CO3	Design and implement syntax-directed translation schemes for generating intermediate code, including three-address code, quadruples, and triples, and handle translations of complex constructs like arrays, control statements, and procedure calls.
CO4	Construct and manage symbol tables, implement runtime administration using stack allocation, and handle scope information in block-structured languages.
CO5	Perform code optimization using techniques like loop optimization, DAG representation, and algebraic laws, and understand error detection and recovery strategies for handling lexical, syntax, and semantic errors.

S. No	Contents	Contact Hours
UNIT 1	Introduction: Definition, Phases and Passes, FSM & RE's and their application to Lexical Analysis, Implementation of Lexical Analyzers, Lexical- Analyzer Generator, Lex – Compiler.	**6**
UNIT 2	Syntax Analysis: Formal Grammar and their application to Syntax Analysis, BNF Notation,. The Syntactic specification of Languages: CFG, Derivation and Parse Trees, Shift Reduce Parsing, Operator precedence parsing, top down Parsing, Predictive Parsers. LR Parsers, the canonical collection of LR(0)items, constructing SLR Parsing Tables, Constructing canonical LR Parsing tables and LALR parsing tables , An Automatic Parser Generator, YACC.	**12**
UNIT 3	Syntax Directed Translation: Syntax directed Translation Schemes, Implementation of Syntax directed translators, Intermediate Code, Postfix notation, Parse Trees and Syntax Trees, Three address Code, Quadruple & Triples, Translation of Assignment Statements, Boolean expressions, Control	**10**