

Department of Computer Science & Engineering

National Institute of Technology Srinagar

Subject : Compiler Design

Semester : 7th

Department : Computer Science & Engineering

Course No. : CSE 701

Credits : 4

L T P : 3 1 0

Course Details:

Compiler structure: analysis-synthesis model of compilation, various phases of a compiler, tool based approach to compiler construction.

Lexical analysis: Interface with input, parser and symbol table, token, lexeme and patterns. Difficulties in lexical analysis, Error reporting and Implementation. Regular definition, Transition diagrams, LEX.

Syntax analysis: CFGs, ambiguity, associativity, precedence, top down parsing, recursive descent parsing, transformation on the grammars, predictive parsing, bottom up parsing, operator precedence grammars, LR parsers (SLR, LALR, LR), YACC.

Syntax directed definitions: inherited and synthesized attributes, dependency graph, evaluation order, bottom up and top down evaluation of attributes, L- and S-attributed definitions.

Type checking: type system, type expressions, structural and name equivalence of types, type conversion, overloaded functions and operators, polymorphic functions.

Run time system: storage organization, activation tree, activation record, parameter passing, symbol table, dynamic storage allocation.

Intermediate code generation: intermediate representations, translation of declarations, assignments, control flow, Boolean expressions and procedure calls and Implementation issues.

Code generation and instruction selection: issues, basic blocks and flow graphs, register allocation, code generation, dag representation of programs, code generation from DAGs, peep hole optimization, code generator generators, specifications of machine.

Books Recommended:

1. A. V. Aho, R. Sethi, and J. D. Ullman. *Compilers: Principles, Techniques and Tools* , Addison-Wesley, 1988.
2. C. Fischer and R. LeBlanc. *Crafting a Compiler*, Benjamin Cummings, 1991.
3. A. C. Holub. *Compiler Design in C*, Prentice-Hall Inc., 1993.
4. Appel. *Modern Compiler Implementation in C: Basic Design*, Cambridge Press.
4. Fraser and Hanson. *A Retargetable C Compiler: Design and Implementation* , Addison-Wesley.