CSE3141: Compiler Design
75 Marks [70% Exam, 20% Quizzes/Class Tests, 10% Attendance]
3 Credits, 33 Contact hours, Exam. Time: 4 hours

Introduction: Introduction to compiler, compiler and translator, the structure of a compiler.

Grammars: Notation and concepts for languages and Grammars, sets and string, Discussion and classification of Grammars, Scanner regular expression, regular definition, finite automata, LL and LR Grammars, ambiguous grammar.

Parsing: Basic parsing technique, parsers, shift reduce parsing, operator-procedure parsing, top-down parsing, bottom up parsing, predictive parsing.

Syntax: Syntax directed translation, intermediate code generation, polish notation, parse tree and syntax trees, quadruples, triples, Boolean expression.

Symbol Table: Perspective and motivation of symbol table. Symbol table content, operation on symbol table, organization of symbol table.

Code Optimization: Code optimization, sources of optimization, basic blocks, folding, loop optimization, flowgraph, induction variable elimination, reduction in strength, code motion.

Error Handling: Compile time error handling, error detection, error recovery, error repair.

Coding: Code generation, object programs, problems in code generation, a machine model, a simple code generator, register allocation and assignment peephole optimization.

Books Recommended:

1.	Alfred V. Aho and Jeffrey D. Ullman	:	**Principles of Compiler Design**, *Addison-Wesley Publication*.
2.	A.J. Holub	:	**Compiler design in C**, *Prentice-Hall of India*
3.	Trembly and Sorensen	:	**Theory and Practices of Compiler Writing,** *McGraw-Hill computer science series.*
4.	Hopcroft and Ulman	:	**Introduction to Automata Theory, Languages and Computation**, *University of Toronto*
5.	Adamek	:	**Automata and Algebra**, *Kluwer Academic* Publishers *Norwell, MA, USA*.