

## CP 422 : COMPILER DESIGN

CREDITS : 5 (L = 4, P = 2)

(Prerequisite : PC 202 : Introduction to Computer Technology II)

1. Introduction : Structure of the compiler and various phases of the compilation process; compiler-writing tools.
2. Programming languages : Lexical and syntactic structure of a language; language elements; parameter transmission; storage management.
3. Finite automata and lexical analysis. A simple lexical analyzer; regular expressions and finite automata; implementation.
4. Syntax analysis : Context-free grammars; derivations and parse trees; capabilities of context-free grammars.
5. Basic parsing techniques : Shift-reduce parsing; operator-precedence parsing; top-down parsing; LR parsing.
6. Implementation of the compilation process : Array references; procedure calls; declarations; CASE statements; records. Symbol tables; representation of scope information; run-time storage administration. Error detection and recovery.
7. Code Generation : Object programs; example code generator based on a simple machine model; register allocation and assignment. Overview of code optimization techniques.

### REFERENCE BOOKS :

1. *A V Aho and J D Ullman*  
*Principles of Compiler Design*  
*Narosa Publishing House*
2. *D M Dhamdhere*  
*Compiler Construction - Principles & Practice*  
*MacMillan India*
3. *J P Tremblay and P G Sorenson*  
*The Theory and Practice of Compiler Writing*  
*McGraw Hill International Edition*