

Fundamentals of Computer Programming

Code	Credit Hours
CS-110	3+1

Course Description

The course is designed to introduce students to the fundamental concepts of computer programming using the C programming language as a medium. A systematic approach is used to teach students how to write programs that solve well-specified problems. Emphasis is placed on acquiring basic programming skills, with considerable attention to the fundamental building blocks of computer programs, and the associated concepts and principles. Students will learn programming fundamentals, control structures, functions, arrays, strings, file handling, error handling, pointers, and apply these concepts to solve medium-level complexity problems.

Text Book:

1. Paul J. Deitel and Harvey M. Deitel, C: How to Program (8th Ed.), Pearson, 2012.

Reference Book:

1. The C Programming Language (2nd Ed.) by Kernighan and Ritchie, 1988.
2. Code Complete (2nd Ed.) by Steve McConnell, 2004.
3. The Art of Computer Programming (TAOCP) by Donald E. Knuth, 1968.

Prerequisites

None

ASSESSMENT SYSTEM FOR THEORY

Quizzes	15%
Assignments	10%
Mid Terms	30%
ESE	45%

ASSESSMENT SYSTEM FOR LAB

Lab Work and Report	70%
Lab ESE/Viva	5%
Project	25%

Teaching Plan

Week No	Topics	Learning Outcomes
1	Introduction	Course Outline, objectives, teaching plan, assessment method, overview of C programming, simple C programs
2	Basics of C programming	Input/output, writing, compiling and debugging C programs, Pseudocode
3	Data types	Variables and datatypes, Operators and expressions, Coding Style, flowcharts
4-5	Selection Statements	Selection/conditional statements, conditional/relational operators, ternary operator, switch statement
6-8	Loops	While loops, break statement, continue statement, do while loop, for loop, nested loops
9	MID TERM EXAM	
10-12	Functions	User defined functions, call by value, call by reference, local/global variables, Math library functions, random number generation, recursion
13-14	Arrays	Defining arrays, indexing, searching, sorting, passing arrays to functions, two-dimensional arrays
15	Strings	Defining strings, built-in character library, built-in string library, string manipulations
16-17	Pointers	Defining/initializing pointers, pointer expressions and arithmetic, passing pointers to functions, array of pointers
18	MID TERM EXAM	

Practical:

Experiment No	Description
1	Introduction to Programming and the Translation Process
2	Introduction to the C Programming Language
3	Expressions, Input, Output and Data Type Conversions
4	Conditional Statements
5	While loops
6	for loops
7	Functions
8	Functions
9	Arrays
10	Searching and Sorting Arrays
11	Characters and Strings
12	Pointers