B.Sc. (I.T.) / M.Sc. (I.T.) 2nd Semester

Course : 203 : Fundamentals of Programming using C - II

Course Code	203
Course Title	Fundamentals of Programming using C - II
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2023
Purpose of Course	To teach advanced concepts of C language
Course Objective	To impart knowledge of structures, union, pointers, user defined functions, pre-processor directives and file management features of C language.
Course Outcomes	CO1 : Students will be able to learn advanced concepts of c programming like pointer , structure, union, etc. CO2 : Students will be able to have the knowledge of file system and file management concepts with c language CO3 : Students will be have ability to work on pre-processor
Mapping between COs with PSOs	(table below)
Pre-requisite	Basic knowledge of problem solving and C programming.
Course Outcome	Students will be able to write programs using structures, union, pointers, user defined functions, pre-processor directives and file management in C language.
Course Content	

Mapping between COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	▓	▓			
CO2	▓	▓			
CO3	▓	▓			

Course Content

Unit : 1 : Structure and Union
  1.1 Structure
    1.1.1 Declaring and Defining Structure elements
    1.1.2 Structure Initialization
    1.1.3 Structure assignment
    1.1.4 Array of Structure, Array within a structure
    1.1.5 Nested Structure
    1.1.6 Size of Structure
  1.2 Union

Unit : 2 : User Defined Functions
  2.1 Introduction
  2.2 Declaration and Definition
  2.3 Methods of parameter passing
  2.4 Scope of variables and storage classes
  2.5 Recursion
  2.6 Passing array to functions
  2.7 Passing Structure, union to function

Unit : 3 : Pointer
  3.1 Pointer Basics
  3.2 Pointers and arrays
  3.3 Chain of pointers

3.4 Pointer and character strings
3.5 Array of pointers, pointer to array
3.6 Pointer and functions
    3.6.1 Call by value & call by reference
    3.6.2 Passing array to a function using pointer
3.7 Pointer to structures
3.8 Issues with pointers
3.9 Dynamic memory allocation
    3.9.1 Allocating a memory block
    3.9.2 Allocating multiple blocks of memory
    3.9.3 Altering the size of a block
    3.9.4 Releasing used Space

Unit : 4 : File Management in C
4.1 Introduction: Definition, File structure, concept of Record
4.2 File access modes: Sequential, random, binary,
4.3 File Operations
    4.2.1 Creating a new file
    4.2.2 Opening a file
    4.2.3 Reading from a file
    4.2.4 Writing to a file
    4.2.5 Moving to a specific location in a file (Seek)
    4.2.6 Closing a file
4.4 Error handling during I/O operations
4.5 Command Line Arguments

Unit : 5 : The Pre-processor
5.1 Features of C Preprocessor
5.2 Macro
    5.3.1 Macro Expansion
    5.3.2 Macro with arguments
    5.3.3 Nested Macro
5.3 File Inclusion
5.4 Conditional compilation
5.5 Compiler Control Directives

Reference Book	1 Programming in ANSI C : E. Balagurusamy - Tata McGraw Hill 2 Let us C : Yashwant Kanetkar - BPB Publications 3 Pointers in C : Yashwant Kanetkar - BPB 4 The complete Reference C : Herbert Schildt - McGrawHill 5 Programming with C : R S Bichkar - Universities Press 6 C Programming Language : Karnighan & Ritchie - TMH 7 Mastering Turbo C : Stan Kelly - BPB
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment