I Year-I Semester		L	T	P	C
		4	**0**	**0**	**3**

COMPUTER PROGRAMMING (R161107)

Prerequisite Course:

Basic Knowledge on Computers

Course Description and Objectives:

Formulating algorithmic solutions to problems and implementing algorithms in C

Course Outcomes:

Upon completion of the course, the student will be able to achieve the following outcomes.

Cos	Course Outcomes	POs
1	Understand the basic terminology used in computer programming	1,2,3
2	Use different data types in a computer program.	2,3,5
3	Design programs involving decision structures, loops and functions.	1,2
4	Explain the difference between call by value and call by reference	1,3,5
5	Understand the dynamics of memory by the use of pointers	1,2
6	Use different data structures and create/update basic data files.	1,2

Syllabus:

UNIT-I:

Objective: Notion of Operation of a CPU, Notion of an algorithm and computational procedure, editing and executing programs in Linux.

History and Hardware - Computer Hardware, Bits and Bytes, Components, Programming Languages - Machine Language, Assembly Language, Low- and High-Level Languages, Procedural and Object-Oriented Languages, Application and System Software, The Development of C Algorithms The Software Development Process.

UNIT-II:

Objective: Formulating algorithmic solutions to problems and implementing algorithms in C

Introduction to C Programming- Identifiers, The main () Function, The printf () Function Programming Style - Indentation, Comments, Data Types, Arithmetic Operations, Expression Types, Variables and Declarations, Negation, Operator Precedence and Associativity, Declaration Statements, Initialization.

Assignment - Implicit Type Conversions, Explicit Type Conversions (Casts), Assignment Variations, Mathematical Library Functions, Interactive Input, Formatted Output, Format Modifiers.

UNIT -III:

Objective: Understanding branching, iteration

Control Flow-Relational Expressions - Logical Operators:

Selection: if-else Statement, nested if, examples, Multi-way selection: switch, else-if, examples.

Repetition: Basic Loop Structures, Pretest and Posttest Loops, Counter-Controlled and Condition-Controlled Loops, The while Statement, The for Statement, Nested Loops, The do-while Statement.

UNIT-IV:

Objective: Modular programming and recursive solution formulation.

Modular Programming: Function and Parameter Declarations, Returning a Value, Functions with Empty Parameter Lists, Variable Scope, Variable Storage Class, Local Variable Storage Classes, Global Variable Storage Classes, Pass by Reference, Passing

Addresses to a Function, Storing Addresses, Using Addresses, Declaring and Using

Pointers, Passing Addresses to a Function.

Case Study: Swapping Values, Recursion - Mathematical Recursion, Recursion versus

Iteration.

UNIT-V:

Objective: Data representation using arrays.

Arrays & Strings

Arrays: One-Dimensional Arrays, Input and Output of Array Values, Array Initialization, Arrays as Function Arguments, Two-Dimensional Arrays, Larger Dimensional Arrays- Matrices

Strings: String Fundamentals, String Input and Output, String Processing, Library Functions

UNIT-VI:

Objective: Understanding pointers and dynamic memory allocation. Comprehension of file operations.

Pointers, Structures, Files

Pointers: Concept of a Pointer, Initialization of pointer variables, pointers as function arguments, passing by address, Dangling memory, address arithmetic, character pointers and functions, pointers to pointers, Dynamic memory management functions, command line arguments.

Structures: Derived types, Structures declaration, Initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self-referential structures, unions, typedef, bit-fields.

Data Files: Declaring, Opening, and Closing File Streams, Reading from and Writing to

Text Files, Random File Access

Text Books:
1. ANSI C Programming, Gary J. Bronson, Cengage Learning.
2. Programming in C, Bl Juneja Anita Seth, Cengage Learning.
3. The C programming Language, Dennis Richie and Brian Kernighan, Pearson Education.

Reference Books:
1. C Programming-A Problem Solving Approach, Forouzan, Gilberg, Cengage.
2. Programming with C, Bichkar, Universities Press.
3. Programming in C, ReemaThareja, OXFORD.
4. C by Example, Noel Kalicharan, Cambridge.