



I Year-I Semester		L	T	P	C
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<b>COMPUTER PROGRAMMING (R13105)</b>					

**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:** Notation of operations of CPU, notation of an algorithm and computational procedure, editing and executing programs in Linux

**INTRODUCTION:** Computer systems, Hardware & software concepts.

**Problem solving:** Algorithm / pseudo code, flowchart, program development steps, Computer Languages: machine, symbolic, and high-level languages, Creating and running programs: Writing, editing, compiling, linking, and executing.

**BASICS OF C:** Structure of a C program, identifiers, basic data types and sizes. Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation, Sample programs.

**UNIT II:**

**Objective:** Understanding branching, iteration and data representation using Arrays.

**SELECTION – MAKING DECISIONS:** Two-way selection: if- else, null else, nested if, examples, Multi-way selection: switch, else-if, examples.

**Iterative:** Loops - while, do-while and for statements, break, continue, initialization and updating, event and counter controlled loops, Looping applications: Summation, powers, smallest and largest.

**ARRAYS:** Arrays - concepts, declaration, definition, accessing elements, storing elements, Strings and string manipulations, 1-D arrays, 2-D arrays and character arrays, string manipulations, Multidimensional arrays , Array applications: Matrix Operations, checking the symmetricity of a Matrix,

**Strings:** concepts, c strings.

**UNIT III:**

**Objective:** Modular Programming and recursive solution formulation

**FUNCTIONS-MODULAR PROGRAMMING:** Functions, basics, parameter passing, storage classes-extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, Recursive solutions for Fibonacci series, Towers of Hanoi, header files, C pre-processor, example c programs. Passing 1-D arrays, 2-D arrays to functions.

**UNIT VI:**

**Unit Objective:** Understanding pointers and dynamic memory allocation

**POINTERS:** Pointers- concepts, initialization of pointer variables, pointers and function arguments, passing by address –dangling memory, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory management functions, command line arguments.

**UNIT V:**

**Objective:** Understanding miscellaneous aspects of C

**ENUMERATED, STRUCTURE AND UNION TYPES:** Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self-referential structures, unions, typedef, bit-fields, program applications.

**Bit-wise operators:** logical, shift, rotation, masks.

**UNIT VI:**

**Objective:** Comprehension of file operations

**FILE HANDLING:** Input and output – concept of a file, text files and binary files, Formatted I/O, file I/O operations, example programs.

**Text Books:**

1. Problem Solving and Program Design in C, Hanly, Koffman, 7th ed, PERSON
2. Programming in C, Second Edition Pradip Dey and Manas Ghosh, OXFORD Higher Education
3. Programming in C, A practical approach Ajay Mittal PEARSON
4. The C programming Language by Dennis Richie and Brian Kernighan

**Reference Books:**

1. C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE
2. Programming with C, Bichkar, Universities Press 3. Programming in C, Reema Thareja, OXFORD
3. Programming in C, Reema Thareja, OXFORD
4. C by Example, Noel Kalicharan, Cambridge