### JAWAHARLAL NEHRUTECHNOLOGICALUNIVERSITY:KAKINADA



#### KAKINADA–533003, Andhra Pradesh, India R-16 Syllabus for CSE.JNTUK

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# 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:

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**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.