

# JAWAHARLAL NEHRUTECHNOLOGICALUNIVERSITY: KAKINADA KAKINADA-533003, Andhra Pradesh, India

R-16 Syllabus for Mech.JNTUK

I Year-I Semester	L	T	P	C
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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.