

# SYLLABUS

## Problem Solving Through C BCA-16-104

L T P Cr  
6 - - 3

External Marks: 65

Internal Marks: 10

**Objective :** The objective of this course is to make the student understand programming language concepts, mainly control structures, reading a set of data, stepwise refinement, function and arrays. After completion of this course, the student is expected to analyze the real life problem and write programs in 'C' language to solve problems. The main emphasis of the course is on problem solving aspect.

**Note :**

- (i) The Question Paper will consist of Four Section.
- (ii) Examiner will set total of **NINE** questions **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
- (iii) The students are required to attempt **ONE** question from each Section and the Compulsory question.
- (iv) All questions carry equal marks unless specified.

### SECTION-A

**Programming Process:** Steps in developing of a program, Data Flow Diagram, Decision Table, Algorithm development, Flowchart, Pseudo Code, Testing and Debugging.

**Fundamentals of C Language:** History of C, Character Set, Identifiers and Keywords, Constants, Types of C Constants, Rules for Constructing Integer, Real and character Constants, Variables, Data Types, rules for constructing variables.

**Operators and Expressions:** C Instructions, Arithmetic operators, Relational operators, Logical operators, Assignment Operators, Type Conversion in Assignments, Hierarchy of Operations, Standard and Formatted Statements, Structure of a C program, Compilation and Execution.



## SECTION-B

**Decision Control Structure:** Decision making with IF-statement, IF-Else and Nested IF-Else, The else if Clause.

**Loop Control Structure:** While and do-while, for loop and Nested for loop,

**Case Control Structure:** Decision using switch, The goto statement.

**Functions:** Library functions and user defined functions, Global and Local variables, Function Declaration, Calling and definition of function, Methods of parameter passing to functions, recursion, Storage Classes in C.

## SECTION-C

**Arrays:** Introduction, Array declaration, Accessing values in an array, Initializing values in an array, Single and Two Dimensional Arrays, initializing a 2-Dimensional Array, Memory Map of a 2-Dimensional Array, Passing array elements to a function: Call by value and call by reference, Arrays of characters, Insertion and deletion operations, Searching the elements in an array, Using matrices in arrays, Passing an Entire Arrays to a Function.

**Pointers:** Pointer declaration, Address operator "&", Indirection operator "\*", Pointer and arrays, Pointers and 2-Dimensional Arrays, Pointer to an Array, Passing 2-D array to a Function, Array of Pointers.

**Dynamic Memory Allocation:** malloc(), calloc(), realloc(), free() functions.

## SECTION-D

**String Manipulation in C:** Declaring and Initializing string variables, Reading and Writing strings, String Handling functions (strlen(), strcpy(), strcmp(), strstr()).

**Structures and Unions:** Declaration of structures, Structure Initialization, Accessing structure members, Arrays of structure, Nested structures, Structure with pointers, Union.

**Files in C:** Introduction, Opening and Closing files, Basic I/O operation on files.