2.5 CONCEPT OF PROGRAMMING USING C

L	T	P
5	-	6

RATIONALE

Computers play a vital role in present day life, more so, in the professional life of technician engineers. People, who are working in the field of computer industry, use computers in solving problems more easily and effectively. In order to enable the students use the computers effectively in problem solving, this course offers the modern programming language C along with exposition to various applications of computers. The knowledge of C language will be reinforced by the practical exercises.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Identify the problem and formulate an algorithm for it.
- Identify various control structures and implement them.
- Identify various types of variables.
- Use pointer in an array and structure.
- Use structures and union for handling data.
- Explain the concepts of C programming language
- Explain and implement the language constructs concepts
- Install C software on the system and debug the programme
- Explain and execute member functions of C in the programme
- Describe and implement array concept in C programme
- Describe and execute pointers
- Expose File System using File Handling.

DETAILED CONTENTS

1. Algorithm and Programming Development (08 Periods)

   Steps in development of a program, algorithm development, concept of flowcharts, programming and use of programming, various techniques of programming, Structured Programming, Preprocessors, Debugging, Compiling

2. Program Structure (08 Periods)

Structure of C program, Writing and executing the first C program, Translator: Assembler, Interpreter, Compiler, I/O statement, assign statement, Keywords, constants, variables and data types, storage classes, operators and expressions, Unformatted and Formatted IOS, Data Type Casting

3. Control Structures (10 Periods)

Introduction, decision making with IF – statement, IF – Else and Nested IF, Ladder if-else, Loop: While, do-while, for, Break, Continue, goto and switch statements

4. Functions (10 Periods)

Introduction to functions, Global and Local Variables, Function Declaration, Function Call and Return, Types of Functions, Standard functions, Parameters and Parameter Passing, Call - by value/reference, recursive function, function with array, function with string

5. Arrays and Strings (10 Periods)

Introduction to Arrays, Array Declaration, Length of array, Manipulating arrayelements, Single and Multidimensional Array, Arrays of characters, Passing an array to function, Introduction of Strings, String declaration and definition, String Related function i.e. strlen, strcpy, strcmp

6. Pointers (08 Periods)

Introduction to pointers, Static and dynamic memory allocation, Address operator and pointers, Declaring and initializing pointers, Single pointer, Pointers to an array

7. Structures and Unions (08 Periods)

Declaration of structures, Accessing structure members, Structure Initialization, array of structure variable, Pointer to a structures, Union, Declaration of Union

8. File Handling (08 Periods)

Basics of File Handling, opening and closing of File, reading and writing character from a file

LIST OF PRACTICALS

1. Programming exercises on executing and editing a C program.
2. Programming exercises on defining variables and assigning values to variables.

3. Programming exercises on arithmetic, logical and relational operators.
4. Programming exercises on arithmetic expressions and their evaluation.
5. Programming exercises on formatting input/output using printf and scanf and their return type values.
6. Programming exercises using if statement.
7. Programming exercises using if – Else.
8. Programming exercises on switch statement.
9. Programming exercises on while and do – while statement.
10. Programming exercises on for – statement.
11. Simple programs using functions and recursive function.
12. Programs on one-dimensional array.
13. Programs on two-dimensional array.
14. (i) Programs for concatenation two strings together.
    (ii) Programs for comparing two strings.
15. Simple programs using pointers.
16. Simple programs using structures.
17. Simple programs using union.
18. Simple programs for File Handling

INSTRUCTIONAL STRATEGY

The subject is totally practical based. Students should be given clear idea about the basic concepts of programming. In practical session student should be asked to draw flow chart, write algorithm and then write program for the algorithm and run on computer. It is required that students should maintain records (files with printouts).

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-term and end-term written tests
- Actual laboratory and practical work, exercises and viva-voce
- Software installation, operation, development and viva-voce

RECOMMENDED BOOKS

1. Let us C by Yashwant Kanetkar
2. Programming in ANSI C by E Balaguruswami, , Tata McGraw Hill Education Pvt Ltd , New Delhi
3. Programming in C by Reema Thareja; Oxford University Press, New Delhi
4. Programming in C by Gottfried, Schaum Series, , Tata McGraw Hill Education Pvt Ltd , New Delhi
5. Exploring C by Yashwant Kanetkar; BPB Publications, New Delhi

6. Programmming in C : A Practical Approach by Ajay Mittal, Pearson Publication
7. e-books/e-tools/relevant software to be used as recommended by AICTE/UPBTE/NITTTR.

Websites for Reference:http://swayam.gov.in,http://spoken-tutorial.org

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	08	12
2	08	14
3	10	16
4	10	16
5	10	16
6	08	12
7	08	08
8	08	06
Total	**70**	**100**