

CO101R PROGRAMMING FOR PROBLEM SOLVING

TeachingScheme:03L+00T

EvaluationScheme:30MSE+10ISA +60ESE

Duration of ESE:03 Hrs

Credit:03

TotalMarks:100

Course Description:

This course introduces basic proficiency in programming for solving real life problems.

Desirable awareness/skills:

Basic computer fundamental.

Course Objectives:

The objectives of offering this course are:

- 1 To use the concepts of computing systems for problem solving
- 2 To understand various programming constructs like Array, string, pointer, structure and file.
- 3 To implement algorithms for solving problems using programming languages.

Course Outcomes:

On the successful completion of this course student will learn:

CO1	Implement algorithms for mathematical and scientific problems
CO2	Compare alternate algorithmic approach for problem solving
CO3	Understand the components of computing systems
CO4	Choose datatypes and structures to solve mathematical and scientific problem
CO5	Develop modular programs using control structures

The Relevance Of PO's and strength of co-relation:

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12
CO1	3	3	2	2	3	3		2	2			2
CO2	3	3	2	3	3	3		2	2			2
CO3	3	3	2	2	3	3		2	2		2	
CO4	3	3	3	2	3	3		2	2			
CO5	3	3	2	3	3	3		2	2			

Course Contents

Introduction to Programming: Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.)

Introduction to Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudocode with examples. From Algorithms To Programs;source code, variables (with data types) variables and memory locations, Syntax and Logical Errors Compilation, object and executable code

Tokens, Arithmetic expressions and precedence: keywords, variables, constants, arithmetic operators, relational operators, logical operators, assignment operators, increment and decrement operators, conditional operators, bitwise operators, operator precedence, type casting

Conditional Branching and Loops: Writing and evaluation of conditionals and consequent branching, if, if-else, else if ladder, switch case, Iteration using looping construct like while, for, do-while, continue, break

Arrays: Arrays (1-D,2-D),Character arrays and Strings

Basic Algorithms: Searching, Basic Sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notion of order of complexity through example programs

Function: Functions (including using builtin libraries), Parameter passing in functions, call by value, passing arrays to functions: idea of call by reference

Recursion: Recursion, as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc.

Structure: Structures, Defining structures and Array of Structures

Pointers: Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, notion of linked list (no implementation)

File Handling: defining and opening a file, closing a file, input/output operations on files

Text Books

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
2. E.Balagurusamy, Programming In ANSI C, 4th edition, Tata McGraw Hill,2007.
3. Yashavant Kanetkar, Let Us C,10th edition,BPBPublishments,2010.

Reference Books:

1. Brian W.Kernighan and Dennis M.Ritchie, The C Programming Language, Prentice Hall of India
2. K.R.Venugopal And S.R.Prasad, Mastering C, 1st edition, Tata McGraw Hill, 2011.
3. Stephen G Kochan, Programming In C, 3rd edition, Pearson Education, 2004.
4. Ashok N Kamthane, Computer Programming, 2nd edition, Pearson Education, 2008

CO102R PROGRAMMING FOR PROBLEM SOLVING LAB

Teaching Scheme: 02P, Total: 02

Credit: 01

Evaluation Scheme: 50ICA

Total Marks: 50

COURSE DESCRIPTION:

This course introduces basic proficiency in programming for solving real life problems.

DESIRABLE AWARENESS/SKILLS:

Basic computer fundamental.

COURSE OBJECTIVES:

The objectives of offering this course are:

- 1 To use the concepts of computing systems for problem solving
- 2 To understand various programming constructs like Array, string, pointer, structure and file.
- 3 To implement algorithms for solving problems using programming languages.

COURSE OUTCOMES:

On the successful completion of this course; student will learn;

CO1	Implement algorithms for mathematical and scientific problems
CO2	Compare alternate algorithmic approaches to problem solving
CO3	Understand the components of computing systems
CO4	Choose data types and structures to solve mathematical and scientific problem
CO5	Develop modular programs using control structures

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	3	3		2	2			2
CO2	3	3	2	3	3	3		2	2			2
CO3	3	3	2	2	3	3		2	2		2	
CO4	3	3	3	2	3	3		2	2			
CO5	3	3	2	3	3	3		2	2			

COURSE CONTENTS:

Minimum five experiments from each Group A and Group B shall be performed to cover the entire curriculum of course CO102R. The list given below is just a guideline.

GROUP-A

1. **Program for basic arithmetic operations and expressions:** Performing simple arithmetic operations like Addition, Subtraction, Multiplication, and Division.
2. **Find area and volume of geometric objects:** Calculate area and volume of geometric objects (circle, square, triangle etc.)
3. **Finding greatest and smallest of 3 numbers:** To find smallest and largest numbers from given 3 numbers.
4. **Integer to binary / hex and octal conversion:** To convert integer to binary, hex and octal.
5. **Generating odd / even numbers:** To generate odd and even numbers.
6. **Greatest/smallest/sum/average of 'n' numbers:** To find the greatest/smallest/sum/average of given n numbers using arrays.
7. **Matrix operations:** Performing matrix operation (addition, subtraction, multiplication etc.) using arrays.
8. **Linear / binary search:** To search a number from given n numbers using linear and binary search.

GROUP-B

1. **Checking a number for palindrome:** Check the given number for palindrome.
2. **Finding GCD of two numbers:** Calculate GCD of any two numbers.
3. **Program to swap two numbers using Call by Reference:** Swapping of two numbers using call by reference
4. **Finding factorial of a number:** Calculate the factorial of any given number.
5. **Checking / generating prime numbers:** Generate the prime numbers.
6. **String processing / operations:** Performing string operations using arrays.
7. **Record processing using structure:** Processing student record using structures.
8. **Simple program for FILES:** Read and write operations

Text Books

1. Byron Gottfried, Schaum's Outline of Programming with C, 3rd edition, McGraw-Hill 2007
2. E. Balagurusamy, Programming in ANSI C, 4th edition, Tata McGraw Hill, 2007.
3. Yashavant Kanetkar, Let us C, 10th edition, BPB Publications, 2010.

Reference Books

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd edition Prentice Hall of India 1998.
 2. K. R. Venugopal and S. R. Prasad, Mastering C, 1st edition, Tata McGraw Hill, 2011.
 3. Stephen G Kochan, Programming in C, 3rd edition, Pearson Education, 2004.
 4. Ashok N Kamthane, Computer Programming, 2nd edition, Pearson Education, 2008.
-