Problem Solving using Computers (CMP502)

Yashwantrao Chavan Maharashtra Open University

Course Title : Problem Solving using Computers
Course No : CMP501

Course Details :

Unit 1. Introduction to Computer :
Computer Fundamentals: Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers.

Basic Computer Organization: Units of a computer, CPU, ALU, memory hierarchy, registers, I/O devices.

Unit 2. Techniques of Problem Solving :
Concept of problem solving, Problem definition, Program design
Flowcharting, decision table, algorithms, Structured programming concepts

Unit 3. Planning the Computer Program :
Programming methodologies viz. top-down and bottom-up programming
Debugging, Types of errors in programming, Documentation

Unit 4. Introduction to C :
History of C.
C Basics:
i) C character set, tokens, constants, variables, keywords, identifiers
ii) C operators- arithmetic, logical, assignment, relational, increment and decrement, conditional, bit wise, special, operator precedence, C expressions data types.
Problem solving techniques: flowchart and algorithm.
Formatted input, formatted output instructions.

Unit 5 Decision Making and looping :
Decision making and branching if-statement – if, ifelse, else-if ladder, nested if else, switch case statement, break statement
Decision making and looping - while, do, do- while statement , for loop, continue statement

Unit 6. Arrays and Strings :
Arrays Declaration and initialization of one dimensional, two Dimensional and character arrays, accessing array elements.

Declaration and initialization of string variables, string handling functions from standard library – strlen(), strcpy(), strcat(), strcmp()

Unit 7. Functions and Pointers :

Need of functions, scope and lifetime of variables, defining functions, function call, call by value, call by reference, return values, storage classes. category of function - No argument No return value, No argument with return value, argument with return value, recursion, command line Arguments.

Understanding pointers, declaring pointer variable, initialization of pointer variable, accessing address of a variable, pointer expressions, Pointers arithmetic.

Unit 8. Structures and Unions :

Structure: Defining structure, declaring and accessing structure members, initialization of structure, arrays of structure, Difference between array and structure.

Union: Defining Union, declaring and accessing union members, Difference between structure and union