| CSE11001 | Introduction to Programming | L | T | P | C |
|---|---|---|---|---|---|
| Version 1.0 | Contact Hours -45 | 3 | 0 | 0 | 3 |
| Pre-requisites/Exposure | 10+2 Level Mathematics, Knowledge of Basics of Computer | | | | |
| Co-requisites | Knowledge of Logical Reasoning and Analysis | | | | |

**Course Objectives**

a. To understand the nature of programming as human activity.
b. To practice the programming construct to solve multi-dimensional problems.
c. To relate and implement mathematical concepts through programming in order to solve computational problems.
d. To enable students to acquire structure and written expression required for their profession.
e. To understand the principles of data storage and manipulation.

**Course Outcomes**

On completion of this course, the students will be able to

CO1. **Define** basics concepts of programming structure and implement the basics concepts of Programming.
CO2. **Solve** various problems using programming language and select the best solution.
CO3. **Apply** modularized solution and design such programs to appraise the solution
CO4. **Understand** the basic usage of memory and construct such memory in terms of array in a program.
CO5. **Define** the different data structures for various collection of data.

**Catalog Description**

Programming skills are mandatory for designing or solving problems through digital device. It is the language through which computational/digital devices are communicated rather interfaced. To develop any software programming language is a must. In present era almost, all aspect of life is somehow largely related to virtualization and digital data/information. Devices from smartphones to other handheld devices, drones, cameras, medical instruments etc. all needs programming at some part. In engineering it has become quintessential for the students/research scholars to learn programming. In this course, students will learn how to solve problems in various domains through a programming language. This course enables students with the basic skills of C Programming Language. Five Different related modules comprise this course. First Unit familiarizes students with basics of computers, algorithmic method to solve problem, introduction to generic programming construct. Basics of C Programming is upto iterative structure is depicted in Unit II. In Unit III students will learn about modularization using functions and one advance concept of C Programming, Pointers. Unit IV will cover one of the most important concepts in C Programming, Array and Strings. Unit V will accomplish this course with the advance concept like Structure, Union and File Handling. After this course students will grow their analytical ability to solve problem and logical skill. Also, this course effectively creates the ability to grasp any other Programming Language in easier manner.

## Course Content

**Unit I:** **4 lecture hours**

**Basic Concepts of Programming:** Introduction to components of a Computer System (disks, memory, processor, where a program is stored and executed, operating systems, compilers, etc.), Idea of Algorithm: steps to solve logical and numerical problems, Representation of Algorithms: Flowchart/Pseudo code with examples, From Algorithms to Programs; source code, variables and memory locations, Syntax and Logical Errors in compilation, Object and Executable code

**Unit II:** **10 lecture hours**

**Basics of C Programming :**Characters used in C, Identifiers, Keywords, Data type & sizes, Constants &Variables, Various Operators used such as Arithmetic Operators, Relational & Logical Operators, Increment & Decrement Operators, Assignment Operators, Conditional or Ternary Operators, Bitwise Operators & Expressions; Standard Input & Output, formatted input scanf(), formatted output printf( ); Flow of Control, if-else, switch-case, Loop Control Statements, for loop, while loop, do-while loop, nested loop, break, continue, goto, label and exit() function

**Unit III:** **10 lecture hours**

**Functions and Pointers:** Definition of Function, Declaration or Prototype of Function, Various types of Functions, Call by Value, Call by Reference, Recursion, Tail Recursion, Definition of Pointer, Declaration of Pointer, Operators used in Pointer, Pointer Arithmetic, Functions with Pointer

**Unit IV** **17 lecture hours**

**Arrays and String:** Definition, Single and Multidimensional Arrays, Representation of Arrays - Row Major Order, and Column Major Order, Application of arrays – searching and sorting, Sparse Matrices and their representations. Definition of a String, Declaration of a String, Initialization of a String, Various String Handling Functions with example

**Structures and Unions:** Definition of a Structure, Declaration of a Structure & Structure Variable, Initialization of a Structure, Operators used in Structure, Structure within Structures, Union, Difference between a Structure and a Union

**Files:** Types of File, File Processing, Handling Characters, Handling Integers, Random File Accessing, Errors During File Processing

**Unit V** **4 lecture hours**

**Overview of Stacks and Queues:** Introduction to Stack, Primitive operations on Stack, Real-life applications of Stack, Introduction to Queues, Primitive operations on Queues, Real-life applications of Queues.

**Text Books**


4. Balagurusamy, E., n.d. Programming In ANSI C. 5th ed. Bangalore: mcgraw-hill.
5. Gotfreid (196) *Schaum's Outline of Programming with C*, 2 edn., USA: McGraw-Hill
6. Brian W. Kernighan, Dennis Ritchie (1988) *C Programming Language*, 2 edn., : Prentice Hall.


**Reference Books**


2. Al Kelley, Ira Pohl (1988) *A Book on C*, 4 edn,: Addision Wesley Longman


**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Scheme:**

| Components | Internal Assessment | MTE | ETE |
|---|---|---|---|

| Weightage (%) | 30 | 20 | 50 |
|---|---|---|---|

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

| Mapping between COs and POs | | |
|---|---|---|
| | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | Define basics concepts of programming structure and implement the basics concepts of Programming. | **PO4** |
| **CO2** | Solve various problems using programming language and select the best solution. | **PO1, PO3** |
| **CO3** | Apply the modularized solution and design such programs to appraise the solution | **PO1, PO9** |
| **CO4** | Understand the basic usage of memory and construct such memory in terms of array in a program. Students will also be able to define user defined data types using structure and Union. Create and manipulate permanent storage access through File Handling. | **PO1, PO5** |
| **CO5** | Define different data structures for various collection of data | **PO1, PO11** |

| | | Engineering Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex problems | Modern tool usage | The engineer and society | Environment and sustainability | Ethics | Individual or team work | Communication | Project management and finance | Life-long Learning | Adequate strong skills in learning new programming… | The ability to understand the evolutionary changes in … | Ability to analyze the impact of computer science and … |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Course Code** | **Course Title** | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
| CSE11001 | Introduction to Programming | 3 | - | 1 | 2 | 2 | - | - | - | 1 | - | 1 | - | - | - | - |