

CSE104: Computer Programming

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Programme: B.Tech. (CSE, CCE, ECE, MME)

Year: First

Semester: First

Course: Institute Core

Credits: 3

Hours: 40

Course Context and Overview (100 words):

Computer programming is the fundamental course for all branches of engineering. This course is designed to cater for students who have little or no prior experiences with computer programming. This program of study is directed toward developing programming skills. The objective of the program is to enable students to learn the basics of computer programming and solve programming problems. Programming language C and related skills is the prime focus of this course.

Prerequisite Courses: Mathematical skills appropriate for a good JEE main result.

Course Outcomes (COs):

On completion of this course, the students will have the ability to:
CO1: Understand the basic concepts of computers and programming.
CO2: Design solutions for computational problems and develop programs using programming constructs, control structures, functions and structures based on basic problem solving paradigms.
CO3: Demonstrate familiarity with basic data structures including those requiring dynamic memory allocations.
CO4: Use file handling concepts to store, retrieve and modify persistent data for simple problems.

Course Topics

Contents	Lecture Hours
UNIT – 1 Basic Programming using an Interpreting Programming Environment	

Basic syntax and semantics of a higher-level language, Variables and primitive data types (e.g., numbers, characters, Booleans), Expressions and assignments, Basic input and output handling.	7
Branching Control constructs (if-else, Nested If-else), Iterative constructs (looping)	
UNIT –2 Core Concepts for Computational Platforms	
Computer organization and its hardware components. Integer and floating-point representations.	4
Operating Systems (OS) and their purpose. UNIX OS commands and text-editors for constructing, compiling and running programs.	
UNIT-3 Single function C programs	
Writing simple C programs within function <code>main()</code> using basic types and flow-control constructs. Topics include: variable declarations for basic types, single-dimension arrays, assignment statements, arithmetic expressions, if-statements, switch-statements, for-loops, while-loops.	8
Also introduce: Overview of C standard libraries, input-output using <code>printf()</code> and <code>scanf()</code> , short-circuit evaluation of Boolean expressions, single-dimension arrays.	
Mid-term revision	1
4 UNIT-4 Modular Programming Approach	
Functions: prototype, definition, parameter passing – by value and by reference. Variables: Scope, Lifetime, storage class for variables.	5
Recursion. Sorting and searching.	
UNIT-5 Basic Data Structures	
Records/structure (heterogeneous aggregates), Strings and string processing. Arrays (Multi-dimensional),	5
The concept and properties of algorithms, Informal comparison of algorithm efficiency, Comparing multiple algorithms for a problem.	
UNIT-6 Memory Management and C Pointers	
Static & Dynamic memory allocation, Memory referencing and Dereferencing,	5
Single-linked data-structures: lists – stack, queue disciplines.	
UNIT-7 File Management	
Formatted I/O including file I/O Declaration, definition and accessing	4
Course summary and revision	1

Textbook references (IEEE format):**Text Book:**

1. Class notes if available.

2. Forouzan, B.A & Gilberg R. F., “*Computer Science*”: *A Structured Programming Approach Using C*, 3rd ed, Cengage Learning

Reference books:

1. Brian W. Kernighan, Dennis M. Ritchie, “*The C Programming Language*”: ANSI C, 2nd ed., Prentice Hall.
2. Yashavant P. Kanetkar, “*Let Us C*”, 12th ed., Infinity Science Press, LLC.
3. E. Balagurusamy, “*Programming in ANSI C*”, 4th ed., Tata McGraw-Hill Education
4. Venugopal K R, Prasad S R, “*Mastering C*”, McGraw-Hill Education.

Evaluation Methods:

Item	Weightage
Mid Term	40%
End Term	50%
Random class attendances: As many as necessary. Penalty for each absence: 2.5 marks. (Be warned: Four recorded absence - 0 marks.)	10%

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