Programming with C and C++

CSC-101

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Programming with C and C++

Name of Dept./Centre: **Computer Science and Engineering**

1. Subject Code: Course Title: **Programming with C and C++**
2. Contact Hours: **L: 3** **T: 0** **P: 2**
3. Examination Duration (Hrs.): **Theory: 3** **Practical: 2**
4. Relative Weightage: **CWS: 0** **PRS: 25** **MTE: 25-35** **ETE: 40-50** **PRE: 0**
5. Credits: **4** 6. Semester: **Autumn** 7. Subject Area: **PEC**
8. Pre-requisite: None
9. Objective: Understanding the fundamentals of programming in C and C++
10. Details of the Course:

Details of Course

Sl. No.	Contents	Contact Hours
1.	Introduction to Computers, Introduction to Programming, Linux Prompt, Editor, Compiler, Writing a simple program **Fundamentals of C:** Literals, Keywords, Variables, Constants, data types, Enumerations, Operators: Precedence and Associativity, Expressions, Statements: IO, assignments, decision making	**6**
2	**Control Structure:** if-else, switch case, conversion of if-else to switch-case and vice-versa, loop structure, for loop, while loop, do-while loop, interconversion of the loops, special features of conditional statements	**5**
3.	**Arrays:** Introduction, Declaration, Initialization, Iteration, Modification String Management	**7**
4.	**Functions:** Prototype, Definition, Function call, Library Functions v User-defined Function, Recursion, Conversion of iterative code to recursion and vice versa (Introducing Stack)	**6**

Details of Course

5.	**Structures and Union:** Structures, Nested Structure, Array of structures, Unions **Pointers:** Memory and Pointers, Pointer Arithmetic, Relationship between Arrays and Pointers, Relationship between pointers and functions, void pointer, Function pointers, Self-referential Structures, Dynamic Memory Allocation	**8**
6.	**C++ v C:** Re-iterating control structures, arrays, strings, functions and pointers in C++, References, class, constructor, object, class v structure, Access Specifiers and Modifiers	**4**
7	**Object-oriented Concepts:** Encapsulation, Abstraction, Polymorphism, Inheritance, Sub-classes, Static v Dynamic Binding, Virtual Functions, Static Functions, Introduction to Exception Handling	**6**
	Total	**42**

Books

Sl. No.	Name of Books / Authors	Year of Publication
1.	C Programming Language, Kernighan Brian W. and Dennis M. Ritchie,, 2nd edition Pearson	2015
2.	C: The Complete Reference, Herbert Schildt, 4th Edition, McGraw Hill Education	2017
3.	Understanding Pointers in C, Yashavant Kanetkar,	2003
4.	Let Us C: Authentic guide to C programming language, Yashavant Kanetkar, 19th Edition	2022
5.	Exploring C, Yashavant Kanetkar, BPB Publisher	2004
6.	C++: The Complete Reference, Herbert Schildt, 4th Edition, McGraw Hill Education	2017

Components

- Surprise Quizzes (1 to 3)
  - 10% weightage
- 5% for Class participation
- Practical with Assignments will carry 15% weightage
- Course Website (https://faculty.iitr.ac.in/cs/bala/cpp/csc101.html)
- WhatsApp group?

Timing

- Lectures (GB-105)
  - Tuesday (3 pm) , Wednesday and Friday (2 pm)
- Practical (Lab 2, CSE Department)
  - Friday (9-11 am CS1 and CSE) and Friday (11 am -1 pm)
  - Venue:

Programming Contest Sites

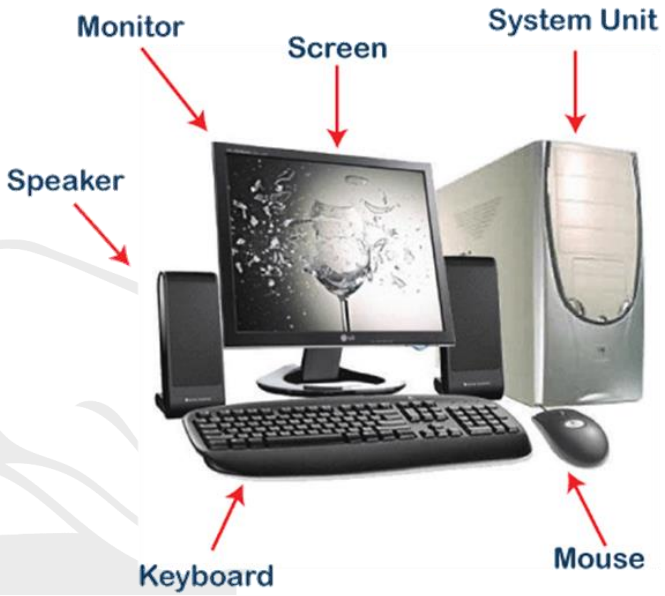
- http://icpc.baylor.edu (ICPC/ ACM ICPC)
  - IIT Roorkee "Kaala Khatta" team has entered World finals in 2023 (waiting for the official announcement)
  - IIT Roorkee "Area 151" team has got 60th rank in 2021 (waiting for the official announcement)
  - IIT Roorkee "Laila" team has got 62nd rank in 2020
  - IIT Roorkee "Hold right there Sparky!!" team has got 49th rank in 2019
  - IIT Roorkee "Triangulation" team has got 68th rank in 2018
  - IIT Roorkee "The 65th bit" team has got 60th rank in 2013
- https://www.codechef.com (Online Contest)
- https://codeforces.com
- http://www.topcoder.com
- http://www.spoj.com
- http://www.interviewstreet.com

Programming Contests Sites

- GeeksForGeeks.
- Google Kick Start.
- Google Summer of Code (GSoC)
- Google Code Jam.
- Google Hash Code.
- The ICFP Programming Competitions.
- Topcoder Coding Competitions.
- HackerEarth.

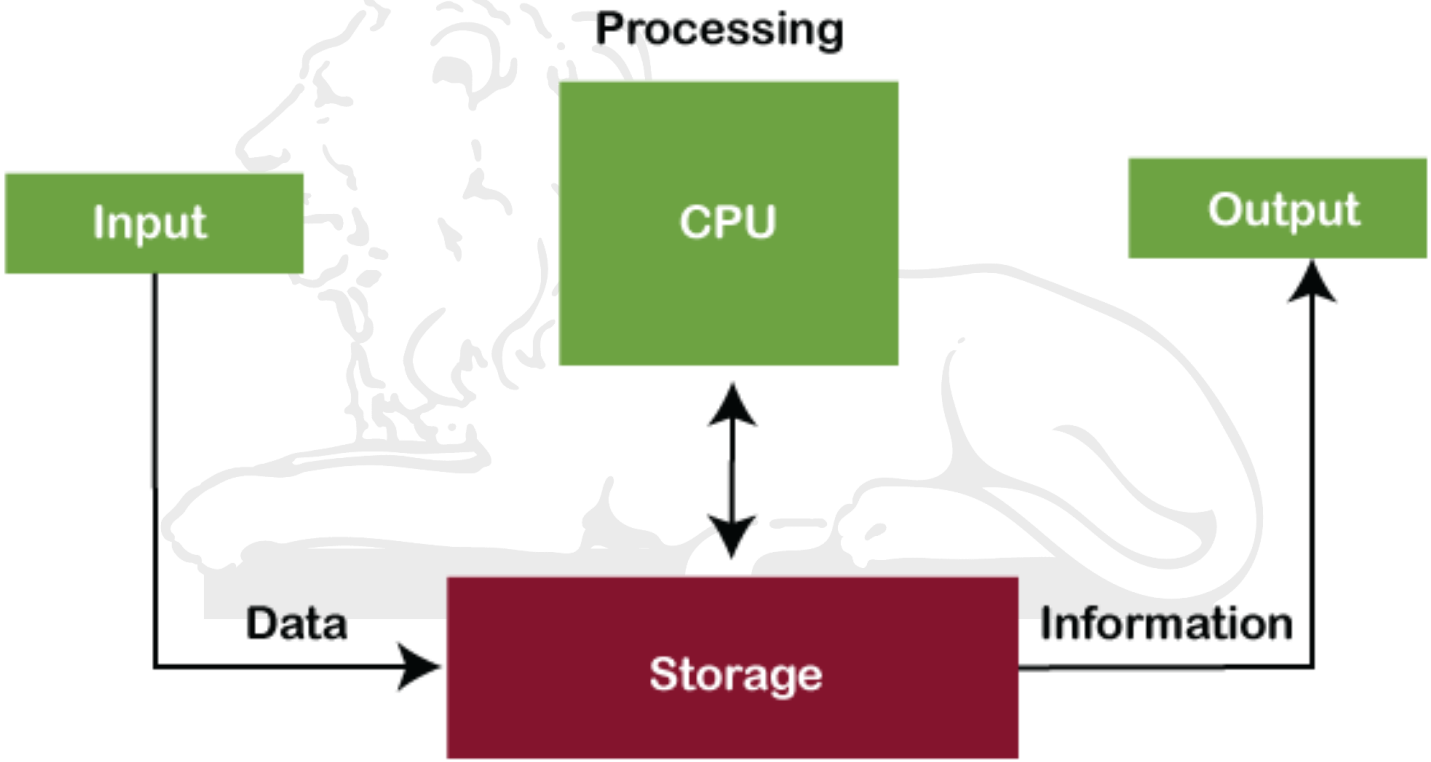
Introduction to Computer Systems

- A computer is a complex system consisting of both *hardware* and *software* components.
- The word *hardware* is used for physical devices such as TV sets, DVD players and computers. The word *software* is used for the information used with such devices: movies, music, novels, web pages, computer programs, and data.
- When talking about computer systems, hardware means the physical parts of the computer. Software means the programs and data used with the physical computer.



Introduction to Computer Systems

- A computer is a programmable electronic device that takes data, perform instructed arithmetic and logical operations, and gives the output.



Thank You!