INTERDISCIPLINARY COURSE

Fundamentals of Computer Science and its applications 45 hrs

Course Outcome:

- Demonstrate the basic concepts of Computer science, such as Computer Architecture, Data representation, Algorithms, and Data structures.
- Write basic programs in a high-level programming language, such as Python.
- Explain how computers communicate with each other over a network.
- Explain how artificial intelligence is used in real-world applications.
- Use ICT tools to create documents, spreadsheets, and presentations.

Detailed Syllabus

- Introduction to computers and computing 08 hr.

History of computing and the different types of computers that are available today, Generations of computers, Basic Building blocks (CPU, Memory, I/O Devices), types of computer (Mainframe, Desktop, Laptop, System on Chip). Classification of Software – System and Application Software, Basic Security Anti-Virus.

- Data representation and number systems 04 hr

Concept of binary code, ASCII and how it is used to represent data in computers, How different number systems work

- Algorithms and data structures 06 hr

Basic concepts of algorithms and data structures: Common algorithms and data structures, such as sorting algorithms and linked lists.

- Office suite 08 hr

  Word processors, Spreadsheets, and Presentation

- Programming languages 08 hr

Basic concepts of programming languages: types of programming languages , machine language, assembly language, high level language, Introduction to writing basic programs in Python (Finding prime numbers, finding GCD of two numbers etc,)

- Networking 05 hr

Basic concept of networking and how computers communicate with each other, LAN, WAN, Introduction to the concept of the internet and how it works. Mobile communication

- Artificial intelligence 05 hr

Basic concept of artificial intelligence and how it is used in computers. Introduction to Machine Learning, Preliminary concept of Big Data, Recommendation System, Conversation Agents like ChatGPT, Prompt Engineering

- Information and Communications (ICT) Tools 01 hr

Importance of ICT tools, different types of ICT tools and their uses

Recommended Books:

1. Computer Science: An Interdisciplinary Approach, Robert Sedgewick (Author), Kevin Wayne (Author)
2. Introduction To Computer Science, Anita Goel Pearson India