



**KAKATIYA UNIVERSITY WARANGAL**  
Under Graduate Courses (Under CBCS AY: 2020-2021 on words)  
**B.Sc. DATA SCIENCE**  
**I Year: Semester-I**

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**Paper – I: Fundamentals of Information Technology**  
**[4 HPW:: 4 Credits :: 100 Marks (External: 80, Internal:20)]**

**Objectives:**

1. To deal with the basic concepts of computers.
2. To discuss about the computer hardware, its components and basic computer architecture.
3. To understand the basic computer software including the operating system and its concepts.
4. To introduce the software development process
5. To introduce the basic concept of programming

**Outcomes:**

Students should be able to

1. Identify the components of a computer and their functions.
2. Understand the concept of networking, LAN, Internet, and working of www.
3. Understand the notion of problem solving using computer by programming
4. Understand the notion of Software Project and the Process of software development

**Unit-I**

**Data and Information:** Introduction, Types of Data, Simple Model of a Computer, Data Processing Using a Computer, Desktop of Computers, Classification of Computers, Anatomy of a Computer, Structure of a Central Processing Unit, Specifications of a CPU, Interconnection of CPU with Memory and I/O Units, **Input Output Devices:** Introduction, Keyboard, Video Display Devices, Touch Screen Display, E-Ink Display, Printers, Audio Output, Memory Hierarchy, Embedded Processors **Acquisition of Numbers and Textual Data:** Introduction, Input Units, Internal Representation of Numeric Data, Representation of Characters in Computers, Error-Detecting Codes

**Unit-II**

**Computer Networks:** Introduction, Local Area Network (LAN), Applications of LAN, Wide Area Network (WAN), Internet, Naming Computers Connected to Internet, Future of Internet Technology **Computer Software:** Introduction, Operating System, Programming Languages, Classification of Programming Languages, Classification of Programming Languages Based on Applications **The Software Problem:** Cost, Schedule, and Quality, Scale and Change **Software Processes:** Process and Project, Component Software Processes, Software Development Process Models **Programming Principles and Guidelines:** Structured Programming, Information Hiding, Some Programming Practices, and Coding Standards

**Unit – III**

**Algorithms:** Definitions, Different Ways of Stating Algorithms (Step-form, Pseudo-code, Flowchart), Strategy for Designing Algorithms, Structured Programming Concept.

**Basics of C:** Overview of C, Developing Programs in C, Parts of Simple C Program, Structure of a C Program, Comments, Program Statements, C Tokens, Keywords, Identifiers,

Data Types, Variables, Constants, Operators and Expressions, Expression Evaluation–precedence and associativity, Type Conversions. Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences, Control Statements: Selection Statements – if, if-else, nested if, nested if-else, comma operator, conditional operator, switch; Iterative Statements–while, for, do-while; Special Control Statement–goto, break, continue, return, exit.

#### **Unit – IV**

Arrays and Strings: One-dimensional Arrays, Character Arrays, Functions from ctype.h, string.h, Multidimensional Arrays. Functions: Concept of Function, Using Functions, Call-by-Value Vs Call-by-reference, Passing Arrays to Functions, Scope of Variables, Storage Classes, and Recursion. Pointers: Introduction, Address of Operator (&), Pointer, Uses of Pointers, Arrays and Pointers, Pointers and Strings, Pointers to Pointers, Structures and Unions.

#### **References**

1. V Raja Raman. Introduction to Information Technology, 3<sup>rd</sup> Edition, PHI Learning Private Limited, 2018
2. Pankaj Jalote. Concise Introduction to Software Engineering, Springer, 2011
3. B. A. Forouzan, R. F. Gilberg, A Structured Programming Approach Using C
4. Fundamentals of Computers, by Rema Tharaja, Oxford University Press India



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***Practical-1: Fundamentals of Information Technology***  
[3 HPW:: 1 Credit :: 25 Marks]

**Objective**

The main objective of this laboratory is to familiarize the students with the basic hardware and software in computers

**Exercises**

1. Assembly and disassembly of a system box and identifying various parts inside the system box to recognize various parts of a typical computer system
2. Assembly and disassembly of peripheral devices- keyboard and mouse and study of their interface cables, connectors and ports.
3. Installation of Operating Systems-Windows and Linux
4. Disk defragmentation using system tool.
5. Procedure of disk partition and its operation (Shrinking, Extending, Delete, Format).
6. Installing and uninstalling of device drivers using control panel.
7. Working practice on Linux operating system: creating file, folder. Copying, moving, deleting file, folder
8. User Account creation and its feature on Windows Operating System and Changing resolution, color, appearances, and Changing System Date and Time.
9. Installation and using various wireless input devices (Keyboard/Mouse/Scanners etc.,)under Windows/Linux.
10. Partition and formatting of hard disk.
11. Installation of scanner, modem and network cards in Windows/Linux.
12. Assembly and disassembly of printer, installing a printer, taking test page, and using printer under Windows/Linux.
13. Installation of application software's – Office Automation, Anti-Virus.
14. Demonstrate the usage of Word and Power point in Windows and Linux
15. Configure Internet connection, Email Account creation, reading, writing and sending emails with attachment.
16. Programs related to the concepts of C-programming