

FUNDAMENTALS OF COMPUTER PROGRAMMING AND IT

SALIENT FEATURES OF THE PRESENT EDITION

- **Motivates the unmotivated** and provides the teachers an unequaled approach that allows them to teach students with a disparity of computer experience backgrounds.
- Covers **detailed theory** supplemented with **appropriate figures and examples**.
- Introduces **Computer Organization**.
- Introduces **Operating System**.
- Introduces **Word Processor, PowerPoint and Spreadsheets**.
- Covers evolution of Internet and its applications and services.
- Covers Problem Solving and Program Planning.
- Provides the Basics of Programming using C++.
- Covers abundance of C++ programming examples with proper testing on Turbo C++ Compiler.
- Covers **adequate number of exercises and review questions** of all types.
- Provides **user friendly approach**.

Other Books by the Same Author :

1. Mastering C++ Programs (*Published by Firewall Media*)
2. Fundamentals of Computers
3. Programming in C and Numerical Analysis (For B.A. / B.Sc. III)
4. Solutions to Numerical Analysis
5. Excel with Objective Book for NIMCET (MCA Entrance Examination)
(*Published by Golden Bells*)
6. Computer Concepts and Programming in C (B.E./B.Tech./MCA U.P. Tech. Univ. Lucknow)
7. Fundamentals of Computers and Programming in C
8. Mastering C Programs (*Published by Firewall Media*)
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12. Computer Fundamentals and Programming in C (For B.Sc. I)
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26. Object Oriented Programming Using C++
27. Fundamentals of Computing and Programming.

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By
J.B. DIXIT

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Dedicated to



All Beloved Readers, Friends

and

Family Members

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———— PREFACE TO THE THIRD EDITION ————

I am highly delighted to place in the hands of my esteemed readers the text of “**FUNDAMENTALS OF COMPUTER PROGRAMMING AND IT**” in its revised form.

This book is written for Engineering, M.Tech., M.C.A., M.Sc. (Computer Science), B.C.A., B.I.T., B.Sc., P.G.D.C.A. and other diploma course students.

PART A of the book presents **Fundamentals of Computer and IT** in a simple and easy to understand style. The subject matter thoroughly clears the doubts (if any) of both a novice or an experienced computer user.

PART B of this book covers **Basics of Programming Using C++**. It presents all the C++ programming topics from elementary to basics of file handling with properly tested programming examples.

I have put my sincere efforts and knowledge to make you understand the subject matter in simplest and easiest form. Valuable suggestions are always most welcome.

WISH YOU A GRAND SUCCESS in your examination, and a very bright future in the field of Computer Science.

—AUTHOR

ACKNOWLEDGEMENTS

It is with a great sense of satisfaction that I acknowledge the help and support rendered to me by many people in bringing this book in its current form.

My heartiest thanks to Mr. Raman Sharma (Manager—WIPRO) for his creative and thoughtful association in the preparation of this book.

My lovely children Apoorva, Aanchal and Vansh always remind me about the work to be completed with their ever smiling faces. So, a special thank to them also.

I would like to thank all my teachers, members of my family, students and well wishers whose blessing, knowledge, advice and interaction have made this project a possible venture in my life.

—AUTHOR

SYLLABUS

BTCS 101 Fundamentals of Computer Programming and IT

Part A (Fundamentals of Computer and IT) (25%)

1. Introduction to Computers

Define a Computer System, Block diagram of a Computer System and its working, associated peripherals, memories, RAM, ROM, secondary storage devices, Computer Software and Hardware. (2)

2. Working Knowledge of Computer System

Introduction to the operating system, its functions and types, working knowledge of GUI based operating system, introduction to word processors and its features, creating, editing, printing and saving documents, spell check, mail merge, creating power point presentations, creating spreadsheets and simple graphs, evolution of Internet and its applications and services. (3)

3. Problem Solving and Program Planning

Need for problem solving and planning a program; program design tools–algorithms, flow charts, and pseudocode; illustrative examples. (2)

Part B (Basics of Programming Using C++) (75%)

4. Overview of C++ Language

Introduction to C++ language, structure of a C++ program, concepts of compiling and linking, IDE and its features; Basic terminology–character set, tokens, identifiers, keywords, fundamental data types, literal and symbolic constants, declaring variables, initializing variables, type modifiers. (3)

5. Operators and Expressions

Operators in C++, precedence and associativity of operators, expressions and their evaluation, type conversions. (2)

6. Beginning with C++ Program

Input/output using extraction (>>) and insertion (<<) operators, writing simple C++ programs, comments in C++, stages of program execution. (4)

7. Control Structures

Decision-making statements: if, nested if, if—else. Else if ladder, switch, Loops and iteration: while loop, for loop, do-while loop, nesting of loops, break statement, continue statement, goto statement, use of control structures through illustrative programming examples. (4)

8. Functions

Advantages of using functions, structure of a function, declaring and defining functions, return statement, formal and actual arguments, const argument, default arguments, concept of reference variable, call by value, call by reference, library functions, recursion, storage classes. Use of functions through illustrative programming examples. (4)

9. Arrays and Strings

Declaration of arrays, initialization of array, accessing elements of array, I/O of arrays, passing arrays as arguments to a function, multidimensional arrays. String as array of characters, initializing string variables, I/O of strings, string manipulation functions (strlen, strcat, strcpy, strcmp), passing strings to a function. Use of arrays and strings through illustrative programming examples. (4)

10. Concepts of Object Oriented Programming

Introduction to Classes, Objects, Data abstraction, Data encapsulation, inheritance and polymorphis. (2)

11. Classes and Objects

Defining classes and declaring objects, public and private keywords, constructors and destructors, defining member functions inside and outside of a class, accessing members of a class, friend function. Use of classes and objects through illustrative programming examples. (4)

12. Basics of File Handling

Opening, reading, and writing of files, error handling during files operation. (2)

Part
A

***FUNDAMENTALS OF
COMPUTER AND IT***

Introduction to Computers

1.1 Introduction

Computer is perhaps the most powerful and versatile tool ever created by human being. In today's world, the use of computers has increased so rapidly that we can no longer ignore them. Computers influence our lives in one way or the other. These days we see computers being used to perform several functions that have made our life easy. The list of services for which computers are used is a long one.

The computer mainly consists of hardware and software. Both of these components work together to process data. Figure 1.1 illustrates these two components.

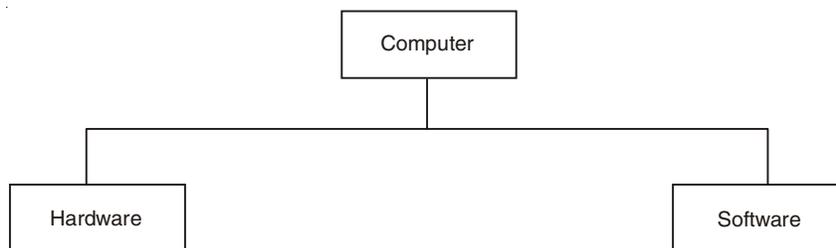
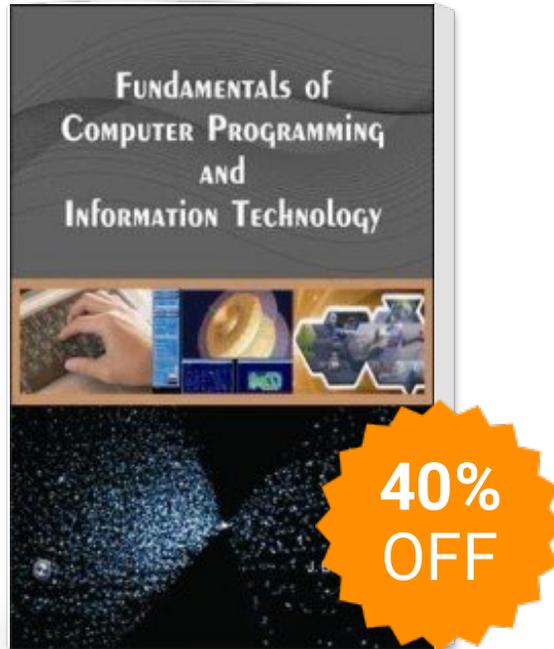


Fig. 1.1. Computer components (Hardware and software).

The parts of computer that can be touched and have some weight are called as hardware. The term hardware is used to refer to all the components inside or outside the computer. In addition to this, components used to interconnect two or more components, for example, wires, are also regarded as hardware. We have several hardware devices that are used at various phases of data processing cycle. The hardware that are used to supply input to computer are called as *input devices*. The hardware that are used to process the data, are called as *processing devices* and the devices that are used to present output of computer, are called as *output devices*. Each of these category has a broad variety of devices of various brands and qualities. The Input/Output Ports/Connections are used for connecting various devices with the motherboard of a computer.

Fundamentals of Computer Programming and IT (PTU) By J.B.Dixit



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Author : J.B.Dixit

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