

# Diploma in Business Information Systems – Part 1

## Computer Fundamentals

The subject offers a general introduction to the world of computing with particular emphasis on the Personal Computer (PC) and its place in the wider world of networks and corporate information systems.

### Aims

1. Introduce students to the basic components of a PC, so they have a clear basic understanding of the main hardware units at a macro level.
2. Introduce the relationship between information and data and the way computers use binary codes to represent data and instructions.
3. Stimulate analysis and to develop a critical approach to the observation of IT systems and networks in everyday use in typical retail and banking sectors.
4. Examine a wide variety of different types of software, from operating systems to development and applications packages, including an introduction to the Internet as a source of information.

### Programme Content and Learning Objectives

**After completing the programme, the student should be able to:**

1. Describe the parts of a PC and how they are configured, using and explaining common terms and abbreviations.
2. Demonstrate awareness of the development of the Intel family of microprocessors and describe the architecture of a simple 8 bit microprocessor.
3. Describe a range of input/output devices and secondary data storage systems and be able to specify appropriate applications for them in the commercial world.
4. Understand the need for good file and disk management and describe how to list, move, copy, delete and recover files using Windows and DOS commands.
5. Describe a typical PC LAN and its component parts; demonstrate basic understanding of client-server and distributed processing systems.
6. Contrast and describe different processing methods and their relationship to the various categories of software, e.g system and development software as well as applications software.

## **Syllabus Content**

### **1. Introduction to Computers**

- Essential PC hardware, peripherals and software. How data is stored and manipulated in the computer.
- Computer configurations including PCs, terminals & workstations and how they can be connected to form networks to serve large and small businesses. Broad introduction to the main types of software.

### **2. Microprocessors and Semiconductor Devices**

- More about number systems: Denary, binary, hexadecimal; simple arithmetic and logical operations on 8 bit binary numbers.
- 8 bit microprocessor architecture, including registers, memory addressing and the fetch/execute cycle.
- Memory devices, simple gates, review of current memory types at an appreciation level.

### **3. Information Processing**

- Data capture devices, (including manual) techniques and their application to real world problems.
- Secondary storage devices; disks, tapes and CD-ROMs. VDUs, printers and other output devices.
- Comparing the use of DOS and WINDOWS 95/8 to control the PC and to manage the filestore effectively. Fundamentals of file organisation: filenames and conventions; serial and direct access.
- File backup and recovery.

### **4. Current IT Issues**

- Open and Proprietary systems and compatibility: MACs and PCs.
- Multi-user systems: e.g. AS400 and UNIX platforms.
- Software Development: traditional programming languages ( 3GLs) versus 4GLs and RAD.
- Information system security, risk assessment, contingency planning and fallback.

### **5. Data Communications**

- Introduction to Networks
- Star and Bus LAN topologies;
- Central and distributed computing;
- Wide area and global networks;
- The World Wide Web; Using the Internet and email effectively.

## Method of Assessment

By written examination. The pass mark is 40%. Time allowed 3 hours.

## The question paper will contain:

Seven questions from which five must be answered. All questions carry 20 marks.

Candidates will be expected to have done some practical work using DOS, WINDOWS95/8 and Internet browser software but this will not be directly assessed by ABE. Certain questions may test the student's understanding of these systems and it would be difficult if impossible to answer such questions adequately without having had some practical experience.

## Reading list:

### Essential Reading

How Computers Work	Ron White	Millennium edn ISBN 0-7897-2112-0
Computers: Tools for an information age	H.L. Capron	5th Ed ISBN 0-201-30558-5

### Additional Reading

How to search the World Wide Web Efficiently	J. Shelley	Babani Books ISBN
Windows 95 Hard disk and file management	P Gatenby	Babani Books ISBN 0-85934-445-2

## Guidance Notes for Tutors

### Weighting of Topics and Sections

The course is divided into five more or less equal sections. If students are offered the recommended 36 hours tuition over, say, 12 weeks, then one would expect to spend about two weeks on each section with two weeks for revision.

#### 1. Introduction to Computers

The idea here is to give a broad sweep introduction, with the emphasis on the main hardware parts of a PC, demystifying the jargon and acronyms. Candidates ought to be able to take a typical current PC advert and explain what all the abbreviations and terms mean, particularly the units of capacity and performance.

The differences, as well as the pros and cons, of various types of workstations and terminals in different work contexts should be clearly explained with examples. Candidates should expect to gain insights into the range and scope of Information Technology in both small businesses and large corporations.

When introducing software it would be a good idea to introduce newcomers to the Internet at this early stage. The formal definitions and explanations will be treated in section 5 on Data Communications, but a user's introduction to searching and downloading information could be of value at the outset. Guidance will be needed in assessing the likely value, authority and accuracy of Internet sources as well as advice about avoiding plagiarism.

## **2. Microprocessors and Semiconductor Devices**

Candidates should be able to add, subtract and perform "and", " or" and "not" operations on 8 bit binary numbers and convert from binary to denary and vice versa. They should be able to draw a diagram of an 8 bit processor with an 8 bit bus having 16 bit memory addressing. They should know the names and functions of all the registers and be prepared to answer questions on the fetch/execute cycle. They should be able to understand and explain the function of simple instructions like MOV B, but they will not be required to program in assembler or binary code.

Candidates should understand how characters and numbers are stored and processed, e.g.ASCII codes, binary instructions and memory addresses. They should know the basic characteristics of the Intel Pentium family of processors and their lookalikes, and have a basic appreciation of the different kinds of memory chips found in commercially available PCs. Finally they should be able to put all this together showing a basic understanding of the layout of a PC motherboard and its block components, including expansion units, sound cards etc.

## **3. Information Processing**

Candidates will be expected to describe typical data capture devices and methods including Bar Code Readers, Magnetic Card Readers, MICR, OMR, OCR and scanners. Exam questions will always feature a mini business scenario and candidates will be expected to apply their knowledge to the situation, rather than just regurgitating the facts parrot fashion.

Disk and tape storage should be understood at the simple physical level (e.g addressing tracks and sectors), and candidates should be able to select the most appropriate storage medium for a wide range of tasks and processing methods. There is a clear link here with the information processing methods discussed in the next section. Output devices should be discussed more from the point of view of business and commercial applications than from a technical standpoint.

Candidates should be able to copy, move, delete and recover files using both DOS and WINDOWS, and manage tree structures, directories and folders. The functions of the autoexec and config files should be understood, and candidates should be able to recognise both system and application files and their functions from their names and extensions.

The concepts of online and offline processing should be introduced (but will be covered more fully in *Computer Applications in Business and Finance*) Students' own experience of logging on to their internet provider to download emails and then logging off while they answer them will be a good way of explaining these concepts..

Basic aspects of security as it affects PC and LAN users should be covered, with emphasis on file and data security. Large scale measures against major disasters in the corporate IT context are introduced in this unit but will be covered at a higher level in the Advanced Diploma course Managing Systems Change.

#### 4. Current IT Issues

This section looks at some of the issues that management has to address when formulating IT strategy. Useful illustrations might include the bid by Microsoft to gain control of the entire PC market and to dictate the development and configuration of hardware. (The so-called browser wars). The relationship between software and the platforms and operating systems upon which it runs must be discussed, using Apple Macs and PCs in the desktop context, and AS400s and so-called UNIX boxes in the multi-user context. What are the advantages and disadvantages of each position?

Candidates should know the stages involved in writing, editing, compiling and linking software using conventional procedural languages, but they are not expected to learn programming in this unit. They should know the differences between the 3GL development environment and the more interactive environment of 4GL and Rapid Application Development methods. This section should be thought of as preparation for the important subsequent module *Contemporary Application Development Methods*.

Candidates should understand and be able to differentiate between commonly used terms in risk assessment, e.g. *danger, risk, vulnerability, exposure, loss, contingency, fallback* and apply them to a typical security situation.

#### 5. Data Communications

Candidates should be able sketch simple diagrams illustrating star and bus networks, and be able to distinguish between central multi-user servers and PC LAN servers and their functions. They should be able to discuss the pros and cons of LANs in terms of shared hardware and data, improved communications, centrally held software. The responsibilities of users and network managers should be understood.

The concepts of client server computing could be illustrated by practical reference to the use of (and access to) remote search engines on the web, and the local presentation of data using browser software running in the client. Candidates should be able to explain all the common terms and acronyms associated with the web, but they will not be expected to write HTML tags.

### CHIEF EXAMINER'S COMMENTS

In this course, the emphasis is on the relationship between the technology and a range of business and commercial applications. A sound basic understanding of key technologies is required without going into minute detail. Each of the sections of this module has been designed to equip candidates to study such topics in greater depth in subsequent modules.

The Examination will be designed to enable candidates who have merely learned the facts to get the barest pass grade. In order to gain credit or distinction, candidates will need to be able to show that they can apply their knowledge to a case study or even a simple but realistic scenario. Good answers must be related closely to the question and its *context* as marks cannot be awarded when candidates wander off the point, however factually correct such irrelevancies may be.

It cannot be emphasised enough that practical work, using DOS and WINDOWS together with an Internet browser and email software, is an essential component of the learning process in this course.