



**education**

Department:  
Education  
REPUBLIC OF SOUTH AFRICA

# **NATIONAL CERTIFICATES (VOCATIONAL)**

## **SUBJECT GUIDELINES**

### **INTRODUCTION TO INFORMATION SYSTEMS**

#### **NQF LEVEL 2**

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# INTRODUCTION

## **A. What is Introduction to Information Systems?**

Introduction to Information Systems gives students an understanding of the information needs of an organisation and the information systems, tools and technologies used to support management and add value to the organisation.

## **B. Why is Introduction to Information Systems important in the Information Technology and Computer Science programme?**

Introduction to Information Systems gives students a solid foundational grasp of critical concepts and issues in Information Technology which enables them to progress to Systems Analysis and Design.

## **C. The link between the Introduction to Information Systems Learning Outcomes and the Critical and Developmental Outcomes**

Students will be able to identify and solve problems and collect, analyse, organise and critically evaluate information related to information systems. Students will also be able to demonstrate an understanding of the world as a set of interrelated systems by recognising that problem-solving contexts do not exist in isolation.

## **D. Factors that contribute to achieving the Introduction to Information Systems Learning Outcomes**

- Ability to think logically and analytically as well as holistically and laterally
- Ability to transfer skills from familiar to unfamiliar situations
- Keen powers of observation
- Meticulous nature
- Interest in computers and related topics

# **INTRODUCTION TO INFORMATION SYSTEMS – LEVEL 2**

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## 1 DURATION AND TUITION TIME

This is a one-year instructional programme comprising 200 teaching and learning hours. The subject may be offered on a part-time basis provided the student meets all the assessment requirements.

Students with special education needs (LSEN) must be catered for in a way that eliminates barriers to learning.

## 2 SUBJECT LEVEL FOCUS

The student is able to demonstrate an understanding of the fundamentals of personal computers and information systems in a business environment.

## 3 ASSESSMENT REQUIREMENTS

### 3.1 Internal assessment (50 percent)

#### 3.1.1 Theoretical component

The theoretical component forms 80 percent of the internal assessment mark.

Internal assessment of the theoretical component in Introduction to Information Systems Level 2 takes the form of observation, class questions, group work, informal group competitions with rewards, individual discussions with students, class, topic and semester tests and internal examinations. Lecturers can observe students when marking exercises from the previous day and asking class questions.

Assignments, case studies and tests can be completed at the end of a topic. Tests and internal examinations must form part of the internal assessment.

#### 3.1.2 Practical component

The practical component forms 20 percent of the internal assessment mark.

Practical components include applications and exercises. All practical components must be indicated in a Portfolio of Evidence (PoE).

Internal assessment of the practical component in Introduction to Information Systems Level 2 takes the form of assignments, practical exercises, case studies and practical examinations in a simulated business environment.

Students may complete practical exercises daily. Assignments and case studies can be completed at the end of a topic. Practical examinations can form part of internal practical assessment.

- **Some examples of practical assessments include, but are not limited to:**

- A. Presentations (lectures, demonstrations, group discussions and activities, practical work, observation, role-play, independent activity, synthesis and evaluation)
- B. Exhibitions by students
- C. Visits undertaken by students based on a structured assignment task
- D. Research
- E. Task performance in a "Structured Environment"

- **Definition of 'structured environment'**

For the purposes of assessment, "Structured Environment" refers to a simulated workplace or workshop environment. It is advised that a practicum room is available on each campus for practical assessment.

- **Evidence in practical assessments**

All evidence pertaining to evaluation of practical work must be reflected in the students' Portfolio of Evidence (PoE). The tools and instruments constructed and used to conduct these assessments must be clear from the evidence contained in the Portfolio of Evidence (PoE).

### 3.1.3 Processing of internal assessment mark for the year

A year mark out of 100 is calculated by adding the marks of the theoretical component (80 percent) and the practical component (20 percent) of the internal continuous assessment (ICASS).

### 3.1.4 Moderation of internal assessment mark

Internal assessment is subjected to internal and external moderation procedures as set out in the *National Examinations Policy for FET College Programmes*.

## 3.2 External assessment (50 percent)

A National Examination is conducted annually in October or November by means of a paper(s) set and moderated externally. A practical component will also be assessed.

External assessment details and procedures are set out in the *Assessment Guidelines: Introduction to Information Systems* (Level 2).

## 4 WEIGHTED VALUES OF TOPICS

TOPICS	WEIGHTED VALUE
1. Computerised Information Processing in the Business Organisation	10
2. Information Technology and its Components	10
3. The Impact of Information Technology on Business Practices and the Economy	20
4. Introduction to Computer Architecture – Computers and Electronic Information Processing	15
5. Introduction to Computer Architecture – Input	15
6. Introduction to Computer Architecture – Output	15
7. Introduction to Computer Architecture – Storage	15
<b>TOTAL</b>	<b>100</b>

## 5 CALCULATION OF FINAL MARK

Internal assessment mark: Student's mark/100 x 50 = a mark out of 50 (a)

Examination mark: Student's mark/100 x 50 = a mark out of 50 (b)

**Final mark: (a) + (b) = a mark out of 100**

All marks are systematically processed and accurately recorded to be available as hard copy evidence for, amongst others, reporting, moderation and verification purposes.

## 6 PASS REQUIREMENTS

The student must obtain fifty (50) percent in ICASS and fifty (50) percent in the examination

## 7 SUBJECT AND LEARNING OUTCOMES

On completion of Introduction to Information Systems Level 2, the student should have covered the following topics:

- Topic 1: Computerised Information Processing in the Business Organisation
- Topic 2: Information Technology and its Components
- Topic 3: The Impact of Information Technology on Business Practices and the Economy
- Topic 4: Introduction to Computer Architecture – Computers and Electronic Information Processing
- Topic 5: Introduction to Computer Architecture – Input
- Topic 6: Introduction to Computer Architecture – Output
- Topic 7: Introduction to Computer Architecture – Storage

## 7.1 Topic 1: Computerised Information Processing in the Business Organisation

**Subject Outcome 1:** Define management theory.

**Learning Outcomes:**

The student should be able to:

- Define the term management  
*Range: planning, organising, staffing, directing, co-ordinating and controlling.*
- Identify management functions in an organisation.
- Identify the various levels in which management is involved in decision-making.

**Subject Outcome 2:** Explain the processes followed by managers when making decisions.

**Learning Outcomes:**

The student should be able to:

- Identify the steps that managers follow to make decisions.
- Identify the characteristics involved in decision-making.

**Subject Outcome 3:** Define organisational theory.

**Learning Outcomes:**

The student should be able to:

- Define the term organisation.
- Identify the interrelated elements that make up an organisation.

**Subject Outcome 4:** Explain why managers need information.

**Learning Outcomes:**

The student should be able to:

- Identify the factors that assist managers to make meaningful decisions.
- Identify the characteristics that managers use to analyse the need for information.

**Subject Outcome 5:** Explain the importance of information systems in a business.

**Learning Outcome:**

The student should be able to:

- Identify the basic information needs that must be fulfilled by information systems.

## 7.2 Topic 2: Information Technology and its Components

**Subject Outcome 1:** Define information technology terminology.

**Learning Outcome:**

The student should be able to:

- Define information technology.
- Define data.
- Define information.
- Define knowledge.

**Subject Outcome 2:** Describe information systems.

**Learning Outcomes:**

The student should be able to:

- Define the term information system.
- Explain the role of information systems in business.
- Explain the main objective of information systems.
- Identify the basic elements of an information system.
- Explain the basic principles of systems design.
- List and explain the factors to consider when designing an information system.

### 7.3 Topic 3: The Impact of Information Technology on Business Practices and the Economy

**Subject Outcome 1:** Explain the impact of computers on management and information systems.

**Learning Outcomes:**

The student should be able to:

- Differentiate between centralisation and decentralisation of information systems.
- Identify three areas where computers affect management.
- Identify specific capabilities of computers in managerial practices.

**Subject Outcome 2:** Explain the impact of computers on the control of business processes.

**Learning Outcomes:**

The student should be able to:

- Identify the controls that are needed for computer-based business information systems.
- Identify additional controls that are required in computer data processing systems.

**Subject Outcome 3:** Explain the risks and advantages associated with computerised operations in business.

**Learning Outcomes:**

The student should be able to:

- Explain the term risk.
- Categorise potential threats to a business organisation.
- Identify the advantages of computer processing.

**Subject Outcome 4:** Explain computer viruses, their impact and management.

**Learning Outcomes:**

The student should be able to:

- Explain the term computer virus.
- Describe different types of computer viruses.
- Define computer viruses in terms of their construction and effect.
- Define the classes of viruses in terms of their impact.
- Describe different ways in which computer viruses can spread.
- Describe methods for protection against computer viruses.
- Describe the methods of disinfecting files.
- List and discuss examples of current anti-virus software, shareware and purchased packages.
- Motivate the reasons for keeping anti-virus software updated.

**Subject Outcome 5:** Explain the impact of information technology on business practices and on the economy.

**Learning Outcomes:**

The student should be able to:

- Explain what changes information technology has had on the organisation of a large business
- Explain the influences information technology developments have had on business.
- Describe how modern-day information technology has become a part of the economy.
- Explain the concept of software piracy.
- Explain the impact of software piracy on individuals and businesses.
- Identify ways in which piracy could be addressed in South Africa.

### 7.4 Topic 4: Introduction to Computer Architecture – Computers and Electronic Information Processing

**Subject Outcome 1:** Describe the history and birth of the computer as an information processing tool.

**Learning Outcomes:**

The student should be able to:

- Identify the early years of computing with reference to information processing.



- Describe the birth of the computer.
- Identify electromechanical computing devices.
- Identify electronic computing devices.

**Subject Outcome 2:** Describe the computer as an electronic processor.

**Learning Outcomes:**

The student should be able to:

- Describe the term computer in terms of its use referring to input, processing, storage and output.
- Explain the term stored program.
- Explain the way in which data and programs are represented in a computer.

**Subject Outcome 3:** Identify the different computer categories.

**Learning Outcomes:**

The student should be able to:

- Describe the different ways in which computers are classified.
- Distinguish between different types of non-portable computers.
- Compare the characteristics of the five generations of computers.
- Differentiate between general-purpose, special-purpose, and pervasive and convergence of computers, media and communications in computing.

**Subject Outcome 4:** Describe the functioning of the central processing unit.

**Learning Outcome:**

The student should be able to:

- Identify major parts of the central processing unit and their functions.
- Explain the addressable location of data.
- Explain the way in which processing speed is measured.
- Explain the function of main memory in computer technology.
- Identify the different types of main memory.
- Explain how data and programs are represented in the computer.
- Explain the functioning of the central processing unit.
- Identify other central processing unit technologies.
- Identify the motherboard and its components.

**Subject Outcome 5:** Explain the advances in memory and processor technology.

**Learning Outcome:**

The student should be able to:

- Identify the developments that have taken place in advancing memory technology.
- Identify the developments that have taken place in advancing processor technology.
- Identify the different categories of peripheral devices.

**Subject Outcome 6:** Describe the different modes of processing.

**Learning Outcome:**

The student should be able to:

- Identify the different modes of processing.

## **7.5 Topic 5: Introduction to Computer Architecture – Input**

**Subject Outcome 1:** Describe the difference between input and direct-entry hardware.

**Learning Outcomes:**

The student should be able to:

- Describe the terms input and input hardware.
- Identify different types of input devices.
- Describe the difference between keyboard entry and direct-entry hardware.

**Subject Outcome 2:** Discuss the fundamentals of using a keyboard for input.

**Learning Outcomes:**

The student should be able to:

- Identify and explain standard typewriter keys.
- Explain and demonstrate the use of cursor movement keys.
- Explain and demonstrate the use of the numeric keypad.
- Explain and demonstrate the use of function keys.
- Explain and demonstrate the use of special-purpose keys.

**Subject Outcome 3:** Describe the different types of terminals used for data input.

**Learning Outcomes:**

The student should be able to:

- Explain the term terminal.
- Explain different types of terminals used for data input.
- Identify examples of terminals according to type.

**Subject Outcome 4:** Describe the different categories of direct-entry input devices.

**Learning Outcomes:**

The student should be able to:

- Identify different pointing devices used for direct-entry input.
- Identify different scanning devices and how they are used.
- Identify different voice recognition systems.

**Subject Outcome 5:** Describe audio-input and video-input devices.

**Learning Outcomes:**

The student should be able to:

- Identify different ways in which audio is digitised.
- Identify types of video card.
- Identify types of electronic camera.
- Identify uses of sensors with examples.

**Subject Outcome 6:** Describe the importance of input controls.

**Learning Outcomes:**

The student should be able to:

- Explain the necessity of input controls.
- Identify control procedures that are used to ensure the accuracy of data.

## **7.6 Topic 6: Introduction to Computer Architecture – Output**

**Subject Outcome 1:** Describe the basic forms of output and categories of output media and hardware.

**Learning Outcomes:**

The student should be able to:

- Describe the terms output and output hardware.
- Identify categories of output devices and list examples of each.

**Subject Outcome 2:** Describe hardcopy output devices.

**Learning Outcomes:**

The student should be able to:

- Identify types of output devices.
- Identify printer classifications.
- Identify major strengths and weaknesses of each printer.
- Identify capabilities of multifunction printing technology.
- Identify advantages and disadvantages of using multifunction printers.
- Identify principal kinds of plotters.
- Identify uses of plotters in a business environment.

- Identify advantages and disadvantages of using plotters in a business environment.

**Subject Outcome 3:** Describe softcopy output devices.

**Learning Outcomes:**

The student should be able to:

- Define the term softcopy
- Explain softcopy output hardware.
- Identify types of monitors or screens.
- Explain the cathode-ray tube (CRT).
- Explain the size and resolution of a computer display screen.
- Explain flat-panel displays(LCD, Liquid Crystal Displays)
- Distinguish between different flat-panel displays.
- Describe video projection display units.
- Identify different types of audio-output devices.

**Topic 7: Introduction to Computer Architecture – Storage**

**Subject Outcome 1:** Describe the difference between primary and secondary storage.

**Learning Outcomes:**

The student should be able to:

- Describe the terms primary storage and secondary storage.
- Differentiate between primary and secondary storage.
- Explain how data is represented and what measurements units are stored in.
- Describe the term file.
- Identify the different types of files.

**Subject Outcome 2:** Describe the characteristics of portable storage devices.

**Learning Outcomes:**

The student should be able to:

- Explain portable storage devices and media.
- Identify the characteristics of portable devices and media.
- Explain how to take care of portable storage devices and media.

**Subject Outcome 4:** Describe hard disks for computer systems.

**Learning Outcomes:**

The student should be able to:

- Explain what a hard disk is.
- Identify the advantages and disadvantages of hard disks.
- Identify the characteristics of hard disks.
- Explain the fixed disk drive.
- Explain the redundant arrays of independent disks (RAID).

**Subject Outcome 5:** Describe optical disk storage technology.

**Learning Outcomes:**

The student should be able to:

- Describe the term optical disk storage.
- List the uses of the different types of optical disk storage.
- Explain how to take care of optical disk storage devices and media.

**Subject Outcome 6:** Explain how data is represented on magnetic media.

**Learning Outcomes:**

The student should be able to:

- Explain what magnetic media is.
- Explain how data is represented on magnetic media.
- Explain magnetic media units for large computers.

- Explain the use of cartridge tape units.
- Explain the use of magnetic disks.
- Explain the importance of backups.

**Subject Outcome 6:** Describe the importance and the implementation of data compression techniques.

**Learning Outcomes:**

The student should be able to:

- Describe the term data compression.
- Describe different uses of data compression techniques.
- Describe the term codec.
- Identify different compression techniques.
- List the advantages of implementing data compression.

## **8 RESOURCE NEEDS FOR THE TEACHING OF INTRODUCTION TO INFORMATION SYSTEMS LEVEL 2**

### **8.1 Physical resources**

The following teaching aids should be made available, if possible:

- Lecture room
- Library with access to the Internet and reference software, for example Encarta Encyclopaedia

### **8.2 Human resources**

- The lecturer must have completed Management and computer-related subjects at NQF Level 4.
- It would be an advantage if the lecturer has already been declared competent as assessor and/or moderator.
- The lecturer should be trained in outcomes-based education.

### **8.3 Other resources**

- One file per student for Portfolio of Evidence (PoE)
- Computer-related books for referencing
- Textbook