education

Department of Education
REPUBLIC OF SOUTH AFRICA

National Curriculum Statement
Grades 10 – 12
(General)

COMPUTER APPLICATIONS TECHNOLOGY

HOW TO USE THIS BOOK

This document is a policy document divided into four chapters. It is important for the reader to read and integrate information from the different sections in the document. The content of each chapter is described below.

■   **Chapter 1 - Introducing the National Curriculum Statement**

This chapter describes the principles and the design features of the National Curriculum Statement Grades 10 – 12 (General). It provides an introduction to the curriculum for the reader.

■   **Chapter 2 - Introducing the Subject**

This chapter describes the definition, purpose, scope, career links and Learning Outcomes of the subject. It provides an orientation to the Subject Statement.

■   **Chapter 3 - Learning Outcomes, Assessment Standards, Content and Contexts**

This chapter contains the Assessment Standards for each Learning Outcome, as well as content and contexts for the subject. The Assessment Standards are arranged to assist the reader to see the intended progression from Grade 10 to Grade 12. The Assessment Standards are consequently laid out in double-page spreads. At the end of the chapter is the proposed content and contexts to teach, learn and attain Assessment Standards.

■   **Chapter 4 – Assessment**

This chapter deals with the generic approach to assessment being suggested by the National Curriculum Statement. At the end of the chapter is a table of subject-specific competence descriptions. Codes, scales and competence descriptions are provided for each grade. The competence descriptions are arranged to demonstrate progression from Grade 10 to Grade 12.

■   **Symbols**

The following symbols are used to identify Learning Outcomes, Assessment Standards, grades, codes, scales, competence description, and content and contexts.

 = Learning Outcome   = Scale

 = Assessment Standard   = Competence Description

 = Grade   = Content and Contexts

 = Code

CONTENTS

ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CASS	Continuous Assessment
CD	Compact Disc
CD-ROM	Compact Disc – Read Only Memory
DVD	Digital Videodisc
DO	Developmental Outcome
FET	Further Education and Training
FTP	File Transfer Protocol
GET	General Education and Training
HCI	Human-Computer Interaction
HIV	Human Immunodeficiency Virus
IKS	Indigenous Knowledge Systems
IRC	Internet Relay Chat
NCS	National Curriculum Statement
NQF	National Qualifications Framework
OBE	Outcomes-Based Education
SAQA	South African Qualifications Framework

CHAPTER 1

INTRODUCING THE NATIONAL CURRICULUM STATEMENT

The adoption of the Constitution of the Republic of South Africa (Act 108 of 1996) provided a basis for curriculum transformation and development in South Africa. The Preamble states that the aims of the Constitution are to:

- heal the divisions of the past and establish a society based on democratic values, social justice and fundamental human rights;
- improve the quality of life of all citizens and free the potential of each person;
- lay the foundations for a democratic and open society in which government is based on the will of the people and every citizen is equally protected by law; and
- build a united and democratic South Africa able to take its rightful place as a sovereign state in the family of nations.

The Constitution further states that 'everyone has the right … to further education which the State, through reasonable measures, must make progressively available and accessible'.

The National Curriculum Statement Grades 10 – 12 (General) lays a foundation for the achievement of these goals by stipulating Learning Outcomes and Assessment Standards, and by spelling out the key principles and values that underpin the curriculum.

PRINCIPLES

The National Curriculum Statement Grades 10 – 12 (General) is based on the following principles:

- social transformation;
- outcomes-based education;
- high knowledge and high skills;
- integration and applied competence;
- progression;
- articulation and portability;
- human rights, inclusivity, environmental and social justice;
- valuing indigenous knowledge systems; and
- credibility, quality and efficiency.

Social transformation

The Constitution of the Republic of South Africa forms the basis for social transformation in our post-apartheid society. The imperative to transform South African society by making use of various transformative tools stems from a need to address the legacy of apartheid in all areas of human activity and in education in particular. Social transformation in education is aimed at ensuring that the educational imbalances of the past are redressed, and that equal educational opportunities are provided for all sections of our population. If social transformation is to be achieved, all South Africans have to be educationally affirmed through the recognition of their potential and the removal of artificial barriers to the attainment of qualifications.

Outcomes-based education

Outcomes-based education (OBE) forms the foundation for the curriculum in South Africa. It strives to enable all learners to reach their maximum learning potential by setting the Learning Outcomes to be achieved by the end of the education process. OBE encourages a learner-centred and activity-based approach to education. The National Curriculum Statement builds its Learning Outcomes for Grades 10 – 12 on the Critical and Developmental Outcomes that were inspired by the Constitution and developed through a democratic process.

The Critical Outcomes require learners to be able to:

- identify and solve problems and make decisions using critical and creative thinking;
- work effectively with others as members of a team, group, organisation and community;
- organise and manage themselves and their activities responsibly and effectively;
- collect, analyse, organise and critically evaluate information;
- communicate effectively using visual, symbolic and/or language skills in various modes;
- use science and technology effectively and critically showing responsibility towards the environment and the health of others; and
- demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.

The Developmental Outcomes require learners to be able to:

- reflect on and explore a variety of strategies to learn more effectively;
- participate as responsible citizens in the life of local, national and global communities;
- be culturally and aesthetically sensitive across a range of social contexts;
- explore education and career opportunities; and
- develop entrepreneurial opportunities.

High knowledge and high skills

The National Curriculum Statement Grades 10 – 12 (General) aims to develop a high level of knowledge and skills in learners. It sets up high expectations of what all South African learners can achieve. Social justice requires the empowerment of those sections of the population previously disempowered by the lack of knowledge and skills. The National Curriculum Statement specifies the minimum standards of knowledge and skills to be achieved at each grade and sets high, achievable standards in all subjects.

Integration and applied competence

Integration is achieved within and across subjects and fields of learning. The integration of knowledge and skills across subjects and terrains of practice is crucial for achieving applied competence as defined in the National Qualifications Framework. Applied competence aims at integrating three discrete competences – namely, practical, foundational and reflective competences. In adopting integration and applied competence, the National Curriculum Statement Grades 10 – 12 (General) seeks to promote an integrated learning of theory, practice and reflection.

Progression

Progression refers to the process of developing more advanced and complex knowledge and skills. The Subject Statements show progression from one grade to another. Each Learning Outcome is followed by an explicit statement of what level of performance is expected for the outcome. Assessment Standards are arranged in a format that shows an increased level of expected performance per grade. The content and context of each grade will also show progression from simple to complex.

Articulation and portability

Articulation refers to the relationship between qualifications in different National Qualifications Framework levels or bands in ways that promote access from one qualification to another. This is especially important for qualifications falling within the same learning pathway. Given that the Further Education and Training band is nested between the General Education and Training and the Higher Education bands, it is vital that the Further Education and Training Certificate (General) articulates with the General Education and Training Certificate and with qualifications in similar learning pathways of Higher Education. In order to achieve this articulation, the development of each Subject Statement included a close scrutiny of the exit level expectations in the General Education and Training Learning Areas, and of the learning assumed to be in place at the entrance levels of cognate disciplines in Higher Education.

Portability refers to the extent to which parts of a qualification (subjects or unit standards) are transferable to another qualification in a different learning pathway of the same National Qualifications Framework band. For purposes of enhancing the portability of subjects obtained in Grades 10 – 12, various mechanisms have been explored, for example, regarding a subject as a 20-credit unit standard. Subjects contained in the National Curriculum Statement Grades 10 – 12 (General) compare with appropriate unit standards registered on the National Qualifications Framework.

Human rights, inclusivity, environmental and social justice

The National Curriculum Statement Grades 10 – 12 (General) seeks to promote human rights, inclusivity, environmental and social justice. All newly-developed Subject Statements are infused with the principles and practices of social and environmental justice and human rights as defined in the Constitution of the Republic of South Africa. In particular, the National Curriculum Statement Grades 10 – 12 (General) is sensitive to issues of diversity such as poverty, inequality, race, gender, language, age, disability and other factors.

The National Curriculum Statement Grades 10 – 12 (General) adopts an inclusive approach by specifying minimum requirements for all learners. It acknowledges that all learners should be able to develop to their full potential provided they receive the necessary support. The intellectual, social, emotional, spiritual and physical needs of learners will be addressed through the design and development of appropriate Learning Programmes and through the use of appropriate assessment instruments.

Valuing indigenous knowledge systems

In the 1960s, the theory of multiple-intelligences forced educationists to recognise that there were many ways of processing information to make sense of the world, and that, if one were to define intelligence anew, one would have to take these different approaches into account. Up until then the Western world had only valued logical, mathematical and specific linguistic abilities, and rated people as 'intelligent' only if they were adept in these ways. Now people recognise the wide diversity of knowledge systems through which people make sense of and attach meaning to the world in which they live. Indigenous knowledge systems in the South African context refer to a body of knowledge embedded in African philosophical thinking and social practices that have evolved over thousands of years. The National Curriculum Statement Grades 10 – 12 (General) has infused indigenous knowledge systems into the Subject Statements. It acknowledges the rich history and heritage of this country as important contributors to nurturing the values contained in the Constitution. As many different perspectives as possible have been included to assist problem solving in all fields.

Credibility, quality and efficiency

The National Curriculum Statement Grades 10 – 12 (General) aims to achieve credibility through pursuing a transformational agenda and through providing an education that is comparable in quality, breadth and depth to those of other countries. Quality assurance is to be regulated by the requirements of the South African Qualifications Authority Act (Act 58 of 1995), the Education and Training Quality Assurance Regulations, and the General and Further Education and Training Quality Assurance Act (Act 58 of 2001).

THE KIND OF LEARNER THAT IS ENVISAGED

Of vital importance to our development as people are the values that give meaning to our personal spiritual and intellectual journeys. *The Manifesto on Values, Education and Democracy* (Department of Education, 2001:9-10) states the following about education and values:

Values and morality give meaning to our individual and social relationships. They are the common currencies that help make life more meaningful than might otherwise have been. An education system does not exist to simply serve a market, important as that may be for economic growth and material prosperity. Its primary purpose must be to enrich the individual and, by extension, the broader society.

The kind of learner that is envisaged is one who will be imbued with the values and act in the interests of a society based on respect for democracy, equality, human dignity and social justice as promoted in the Constitution.

The learner emerging from the Further Education and Training band must also demonstrate achievement of the Critical and Developmental Outcomes listed earlier in this document. Subjects in the Fundamental Learning Component collectively promote the achievement of the Critical and Developmental Outcomes, while specific subjects in the Core and Elective Components individually promote the achievement of particular Critical and Developmental Outcomes.

In addition to the above, learners emerging from the Further Education and Training band must:

■ have access to, and succeed in, lifelong education and training of good quality;
■ demonstrate an ability to think logically and analytically, as well as holistically and laterally; and
■ be able to transfer skills from familiar to unfamiliar situations.

THE KIND OF TEACHER THAT IS ENVISAGED

All teachers and other educators are key contributors to the transformation of education in South Africa. The National Curriculum Statement Grades 10 – 12 (General) visualises teachers who are qualified, competent, dedicated and caring. They will be able to fulfil the various roles outlined in the Norms and Standards for Educators. These include being mediators of learning, interpreters and designers of Learning Programmes and materials, leaders, administrators and managers, scholars, researchers and lifelong learners, community members, citizens and pastors, assessors, and subject specialists.

STRUCTURE AND DESIGN FEATURES

Structure of the National Curriculum Statement

The National Curriculum Statement Grades 10 – 12 (General) consists of an Overview Document, the Qualifications and Assessment Policy Framework, and the Subject Statements.

The subjects in the National Curriculum Statement Grades 10 – 12 (General) are categorised into Learning Fields.

What is a Learning Field?

A Learning Field is a category that serves as a home for cognate subjects, and that facilitates the formulation of rules of combination for the Further Education and Training Certificate (General). The demarcations of the Learning Fields for Grades 10 – 12 took cognisance of articulation with the General Education and Training and Higher Education bands, as well as with classification schemes in other countries.

Although the development of the National Curriculum Statement Grades 10 – 12 (General) has taken the twelve National Qualifications Framework organising fields as its point of departure, it should be emphasised that those organising fields are not necessarily Learning Fields or 'knowledge' fields, but rather are linked to occupational categories.

The following subject groupings were demarcated into Learning Fields to help with learner subject combinations:

- Languages (Fundamentals);
- Arts and Culture;
- Business, Commerce, Management and Service Studies;
- Manufacturing, Engineering and Technology;
- Human and Social Sciences and Languages; and
- Physical, Mathematical, Computer, Life and Agricultural Sciences.

What is a subject?

Historically, a subject has been defined as a specific body of academic knowledge. This understanding of a subject laid emphasis on knowledge at the expense of skills, values and attitudes. Subjects were viewed by some as static and unchanging, with rigid boundaries. Very often, subjects mainly emphasised Western contributions to knowledge.

In an outcomes-based curriculum like the National Curriculum Statement Grades 10 – 12 (General), subject boundaries are blurred. Knowledge integrates theory, skills and values. Subjects are viewed as dynamic, always responding to new and diverse knowledge, including knowledge that traditionally has been excluded from the formal curriculum.

A subject in an outcomes-based curriculum is broadly defined by Learning Outcomes, and not only by its body of content. In the South African context, the Learning Outcomes should, by design, lead to the achievement of the Critical and Developmental Outcomes. Learning Outcomes are defined in broad terms and are flexible, making allowances for the inclusion of local inputs.

What is a Learning Outcome?

A Learning Outcome is a statement of an intended result of learning and teaching. It describes knowledge, skills and values that learners should acquire by the end of the Further Education and Training band.

What is an Assessment Standard?

Assessment Standards are criteria that collectively describe what a learner should know and be able to demonstrate at a specific grade. They embody the knowledge, skills and values required to achieve the Learning Outcomes. Assessment Standards within each Learning Outcome collectively show how conceptual progression occurs from grade to grade.

Contents of Subject Statements

Each Subject Statement consists of four chapters and a glossary:

■ *Chapter 1, Introducing the National Curriculum Statement:* This generic chapter introduces the National Curriculum Statement Grades 10 – 12 (General).
■ *Chapter 2, Introducing the Subject:* This chapter introduces the key features of the subject. It consists of a definition of the subject, its purpose, scope, educational and career links, and Learning Outcomes.
■ *Chapter 3, Learning Outcomes, Assessment Standards, Content and Contexts:* This chapter contains Learning Outcomes with their associated Assessment Standards, as well as content and contexts for attaining the Assessment Standards.
■ *Chapter 4, Assessment:* This chapter outlines principles for assessment and makes suggestions for recording and reporting on assessment. It also lists subject-specific competence descriptions.
■ *Glossary:* Where appropriate, a list of selected general and subject-specific terms are briefly defined.

LEARNING PROGRAMME GUIDELINES

A Learning Programme specifies the scope of learning and assessment for the three grades in the Further Education and Training band. It is the plan that ensures that learners achieve the Learning Outcomes as prescribed by the Assessment Standards for a particular grade. The Learning Programme Guidelines assist teachers and other Learning Programme developers to plan and design quality learning, teaching and assessment programmes.

CHAPTER 2

COMPUTER APPLICATIONS TECHNOLOGY

DEFINITION

Computer Applications Technology is the effective use of information and communication technologies in an end-user computer applications environment in different sectors of society.

PURPOSE

Computer Applications Technology equips learners with knowledge, skills, values and attitudes to create, design and communicate information in different formats. It also makes it possible for learners to collect, analyse and edit data and to manipulate, process, present and communicate information to different sectors of society.

This subject will ensure that learners:

■ make informed decisions when accessing, capturing and analysing data;
■ manipulate, interpret and process information;
■ apply problem-solving skills, using critical and creative thinking, within the context of end-user computer applications;
■ acquire knowledge and skills that enhance their competence to interact with different end-user computer applications (e.g. word processing, spreadsheets and databases);
■ have a general understanding of social, environmental and global issues that are linked to the use of information and communication technologies;
■ communicate effectively by using the appropriate communication modes and tools;
■ apply end-user computer applications knowledge and skills ethically and responsibly;
■ demonstrate an understanding of the effective management of information;
■ organise their daily activities responsibly and effectively within different contexts;
■ reveal natural talents and enthusiasm, thereby contributing to excellence and achievement;
■ develop marketable skills, thereby enhancing capabilities and job satisfaction; and
■ engage in lifelong learning, effective job performance capabilities and job satisfaction.

SCOPE

Computer Applications Technology is responsive to the developmental vision of this country, that all South Africans will be equipped with marketable skills to cope in an information society. It encourages a teaching and learning milieu that recognises that people operate differently, have different learning styles and have culturally

diverse perspectives. It also enables learners to transfer their end-user computer applications knowledge and skills to other fields and subjects. Computer Applications Technology embraces inclusive education by providing opportunities, alternative methods of instruction and flexible assessment for learners who experience barriers to learning.

Computer Applications Technology addresses the Critical and Developmental Outcomes of outcomes-based education. These are clearly indicated in the Learning Outcomes for the subject.

Computer Applications Technology enhances:

■ the development of self-discipline, confidence, productivity, accuracy, neatness and personal style necessary for the effective application of information management and communication skills;
■ an understanding of and proficiency in collecting, accessing, capturing and analysing data, as well as interpreting, manipulating and processing information in order to make informed decisions;
■ effective communication by using appropriate communication modes and tools;
■ the ethical and responsible use of end-user computer application programmes;
■ the responsible use of information and communication technologies in the promotion and protection of human rights and values;
■ gender equality and equal opportunities to all learners who have access to computers; and
■ entrepreneurial skills and opportunities.

EDUCATIONAL AND CAREER LINKS

The broad and general principles, concepts and skills developed in the General Education and Training band in the Learning Areas of Economic and Management Sciences (Learning Outcome 3) and Technology (Learning Outcomes 1 and 3) are further extended in the Further Education and Training band. In addition, Computer Applications Technology links with Mathematics (Learning Outcome 5), Languages (Learning Outcome 5), Natural Sciences (Learning Outcomes 2 and 3) and Arts and Culture (Learning Outcomes 1 and 4).

Although Computer Applications Technology is located within the Information Technology and Computer Sciences sub-field, this subject is complementary to all other subjects in the Further Education and Training band.

The Computer Applications Technology Learning Outcomes in the Further Education and Training band articulate with current learning in Higher Education and will enable learners to enhance their further studies in a variety of different fields (e.g. education, computer science, economics, technology, engineering and tourism).

Computer Applications Technology allows learners to develop basic to advanced end-user computer skills. This ensures that learners can enter different career pathways in a number of fields, or apply these and related skills to create employment for themselves and for others.

LEARNING OUTCOMES

Learning Outcome 1: Operational Knowledge of Information and Communication Technologies

The learner is able to demonstrate operational knowledge of information and communication technologies and the environments in which they operate.

This Learning Outcome requires learners to operate competently in an electronic environment and encapsulates basic operational knowledge of:

- computer hardware and software;
- networked environments;
- information and communication technologies in different environments;
- computer ethics, security and viruses;
- ergonomics, health and safety issues;
- social and environmental issues;
- using an operating system including file management; and
- general trouble shooting.

Learning Outcome 2: Integrated End-user Computer Applications Skills and Knowledge in Problem Solving

The learner is able to apply and integrate end-user computer applications skills and knowledge to solve problems related to the processing, presentation and communication of information.

This Learning Outcome concentrates on:

- competence in input and manipulation of data;
- effective use of various end-user computer application programmes;
- problem solving and creative thinking;
- integration of various end-user computer application programmes in a variety of contexts;
- transfer of generic end-user computer applications skills to new situations and contexts;
- effective communication; and
- accuracy, proficiency, productivity and flexibility.

Learning Outcome 3: Information Management

The learner is able to apply information management processes and skills using end-user computer applications.

This Learning Outcome deals with the processes of information management:

■ find, collect, analyse and critically evaluate data;
■ organise and process information in various formats; and
■ present and communicate information.

CHAPTER 3

LEARNING OUTCOMES, ASSESSMENT STANDARDS, CONTENT AND CONTEXTS

Grade 10

Learning Outcome 1

Operational Knowledge of Information and Communication Technologies

The learner is able to demonstrate operational knowledge of information and communication technologies and the environments in which they operate.

Assessment Standards

We know this when the learner is able to:

■ Briefly describe the basic operation and terminology of relevant computer hardware and software and the aims and objectives of networked environments.

■ Install, configure and use input and output devices.

■ Describe the concept of file organisation in multi-level directories.

■ Identify legal, ethical and security issues related to information technology.

■ Describe certain basic issues related to the impact of information and communication technologies on the local environment and society.

Grade 11

Assessment Standards

We know this when the learner is able to:

- Report on relevant computer hardware, software and local area networks.

- Use suitable utility software to carry out basic trouble shooting functions.

- Develop and maintain multi-level organisational structures in multiple storage media.

- Discuss legal, ethical and security issues related to information technology.

- Describe the impact of information and communication technologies on the environment and society in a national context.

Grade 12

Assessment Standards

We know this when the learner is able to:

- Demonstrate a knowledge of relevant computer hardware, software and wide area network environments.

- Demonstrate an understanding in trouble shooting simple end-user computer-related hardware and software problems.

- Adequately manipulate files and folders.

- Identify, describe and illustrate legal, ethical and security issues related to information technology.

- Identify, discuss, value and illustrate issues related to the impact of information and communication technologies on the environment and society in a global context.

Grade 10

Learning Outcome 2

Integrated End-user Computer Applications Skills and Knowledge in Problem Solving

The learner is able to apply and integrate end-user computer applications skills and knowledge to solve problems related to the processing, presentation and communication of information.

Assessment Standards

We know this when the learner is able to:

■ Demonstrate a basic level of competence and accuracy in the input of data.

■ Enter, edit and format text, numerical data and graphics using basic techniques in a word processing programme.

■ Enter, edit and format text and numerical data using basic functions and formulae in a spreadsheet programme by applying appropriate techniques.

■ Demonstrate the ability to utilise basic integration techniques using word processing and spreadsheet programmes.

■ Interpret written layout and editing instructions to produce accurate output.

■ Demonstrate understanding of a variety of communication modes and tools.

Grade 11

Assessment Standards

We know this when the learner is able to:

■ Use essential procedures, techniques and operations in the accurate input of data.

■ Enter, edit and format text, numerical data and graphics using advanced techniques in a word processing programme.

■ Use logical functions and formulae to process data and create and edit charts in a spreadsheet programme by applying appropriate techniques.

■ Create a single table data source and generate simple forms, queries and reports using a database programme.

■ Enter, edit and process text, numerical data and/or graphics in any end-user computer application programme other than word processing, spreadsheet or database programmes.

■ Demonstrate the ability to utilise advanced integration techniques using appropriate programmes.

■ Use written and simple electronic reviewing and editing instructions to produce accurate output.

■ Communicate information effectively by using a variety of communication modes and tools.

Grade 12

Assessment Standards

We know this when the learner is able to:

■ Apply productive methods, procedures and techniques to accurately input data.

■ Apply advanced word processing techniques in various contexts.

■ Apply knowledge and skills of a spreadsheet programme in various contexts.

■ Apply knowledge and skills of a database programme in various contexts.

■ Apply knowledge and skills in various contexts by using any end-user computer application programme other than word processing, spreadsheet or database programmes.

■ Apply logical thinking to respond to challenges in a variety of contexts in the end-user computer application environment using techniques of integration.

■ Interpret written and electronic layout and editing instructions to produce accurate output in a competent fashion.

■ Communicate information effectively by selecting and using appropriate communication modes and tools.

Grade 10

Learning Outcome 3

Information Management

The learner is able to apply information management processes and skills using end-user computer applications.

Assessment Standards

We know this when the learner is able to:

■ Use technologies to locate and collect specific data using relevant methods.

■ Extract and record information in appropriate electronic formats.

■ Present and communicate information in electronic formats.

Grade 11

Assessment Standards

We know this when the learner is able to:

- Use technologies to locate, collect and analyse various forms of data using relevant methods.

- Organise, record and summarise information in appropriate electronic formats.

- Present and communicate information in appropriate formats.

Grade 12

Assessment Standards

We know this when the learner is able to:

- Make informed decisions in the data collection process.

- Apply logical thinking skills when processing information.

- Formulate responses and present and communicate information in a professional fashion.

CONTENT AND CONTEXTS FOR THE ATTAINMENT OF ASSESSMENT STANDARDS

In this section content and contexts are provided to support the attainment of the Assessment Standards. The content indicated needs to be dealt with in a way that will assist learners to progress towards the achievement of the Learning Outcomes. Content must serve the Learning Outcomes and not be an end in itself. The contexts suggested will enable the content to be embedded in situations which are meaningful to learners and so assist learning and teaching. The teacher should be aware of and use local contexts, not necessarily indicated here, which could be more suited to the experiences of learners. Content and context, when aligned to the attainment of the Assessment Standards, provide a framework for the development of Learning Programmes. The Learning Programme Guidelines give more detail in this respect.

The following is possible content that can be used to achieve Assessment Standards. Because of the dynamic nature of the subject, constant changes will have to be made to keep up with new developments. This section must be read in conjunction with the Learning Outcomes and Assessment Standards across the grades (e.g. input and output devices links with Learning Outcome 1 Assessment Standard 2). This can be applied to all Learning Outcomes and Assessment Standards. For further detail, consult the Learning Programme Guidelines.

Learning Outcome 1: Operational knowledge of Information and Communication Technologies

The learner is able to demonstrate operational knowledge of information and communication technologies and the environments in which they operate.

The following topics should be included:

- Computers in all walks of life.
- General concepts of information technology including hardware, software and networked environments.
- Types of computer systems.
- Typical components and characteristics of a computer.
- Input and output devices.
- Types of system software and application software.
- Computer ethics, security and viruses.
- Impact of computers on the environment and society.
- Safety and health issues.
- File management and trouble shooting simple end-user computer-related hardware and software problems.
- Utilising the features of a typical operating system.

Learning Outcome 2: Integrated End-user Computer Applications Skills and Knowledge in Problem Solving

The learner is able to apply and integrate end-user computer applications skills and knowledge to solve problems related to the processing, presentation and communication of information.

The following should be included:

- Processing of text, number and graphics at an advanced level, using a word processing programme:
  - proficiency in the input of data;
  - entering, editing and formatting text, numbers and graphics;
  - creation of visual and printed matter;
  - design and layout of documents;
  - use of templates.

- Basic processing of numerical data, using a spreadsheet programme:
  - working with cells and ranges;
  - formatting cells and worksheets;
  - basic functions and formulae, including SUM, AVERAGE, COUNT, IF, COUNTIF, MIN, MAX;
  - creating and editing charts.

- Creation of single-table data sources to generate forms, queries and reports, using a database programme:
  - creation of a single-table data source;
  - manipulation of records and fields;
  - generation of forms, queries and reports.

- Presentations or web authoring tools or desktop publishing software or any other application software of own choice:
  - entering, editing and formatting text, numbers and graphics;
  - application of good design principles.

- Integration of end-user computer application programmes:
  - working between applications;
  - linking and exchanging (importing/exporting) data with other applications.

- Effective communication of information:
  - different types of communication tools;
  - different modes of communication;
  - use different modes and tools of communication;
  - select appropriate communication modes and tools.

Learning Outcome 3: Information Management

The learner is able to apply information management processes and skills using end-user computer applications.

The following should be included:

■ Task definition:
- recognising information needs;
- defining problems;
- identifying the type and amount of information needed to solve problems.

■ Information-finding strategies:
- considering possible information sources (e.g. various types of electronic resources for data gathering including databases, CD-ROM resources, commercial and Internet online resources, electronic reference works, community and government information electronic resources) as well as primary resources including interviews, surveys, experiments and documents that are accessible through electronic means;
- developing a plan/strategy for searching;
- identifying and applying specific criteria for evaluating resources;
- identifying and applying specific criteria for constructing meaningful data gathering tools;
- using a computer to generate modifiable flow charts, timelines, organisational charts and calendars which will help the learner to plan and organise complex or group information problem-solving tasks;
- using a computer or other devices to manage the process (e.g. track contacts and create to-do lists and schedules).

■ Access information:
- locating information from a variety of resources using appropriate computer resources and available technologies;
- accessing specific information found within individual sources by using organisational systems and tools specific to electronic information sources that assist in finding specific and general information.

■ Use of information:
- engaging with information to determine its relevance;
- extracting relevant information through, for example, citations, note taking and summaries;
- processing and analysing statistical data;
- saving and backing up data gathered.

■ Synthesis:
- organising results of information gathering and processing;
- presenting results by selectively creating or generating printed reports, computer-generated graphics, charts, tables and graphs, original databases, electronic slide shows, overhead transparencies, Web pages, etc.

■ Evaluation of the effectiveness and efficiency of information management:
- content, format and design;
- spell and grammar checking capabilities;
- legal principles and ethical conduct related to information technology with special attention to copyright and plagiarism;
- netiquette when using Internet, e-mail, etc;
- information problem-solving process (efficiency).

CHAPTER 4

ASSESSMENT

INTRODUCTION

Assessment is a critical element of the National Curriculum Statement Grades 10 – 12 (General). It is a process of collecting and interpreting evidence in order to determine the learner's progress in learning and to make a judgement about a learner's performance. Evidence can be collected at different times and places, and with the use of various methods, instruments, modes and media.

To ensure that assessment results can be accessed and used for various purposes at a future date, the results have to be recorded. There are various approaches to recording learners' performances. Some of these are explored in this chapter. Others are dealt with in a more subject-specific manner in the Learning Programme Guidelines.

Many stakeholders have an interest in how learners perform in Grades 10 – 12. These include the learners themselves, parents, guardians, sponsors, provincial departments of education, the Department of Education, the Ministry of Education, employers, and higher education and training institutions. In order to facilitate access to learners' overall performances and to inferences on learners' competences, assessment results have to be reported. There are many ways of reporting. The Learning Programme Guidelines and the Assessment Guidelines discuss ways of recording and reporting on school-based and external assessment as well as giving guidance on assessment issues specific to the subject.

WHY ASSESS

Before a teacher assesses learners, it is crucial that the purposes of the assessment be clear and unambiguous. Understanding the purposes of assessment ensures that an appropriate match exists between the purposes and the methods of assessment. This, in turn, will help to ensure that decisions and conclusions based on the assessment are fair and appropriate for the particular purpose or purposes.

There are many reasons why learners' performance is assessed. These include monitoring progress and providing feedback, diagnosing or remediating barriers to learning, selection, guidance, supporting learning, certification and promotion.

In this curriculum, learning and assessment are very closely linked. Assessment helps learners to gauge the value of their learning. It gives them information about their own progress and enables them to take control of and to make decisions about their learning. In this sense, assessment provides information about whether teaching and learning is succeeding in getting closer to the specified Learning Outcomes. When assessment indicates lack of progress, teaching and learning plans should be changed accordingly.

TYPES OF ASSESSMENT

This section discusses the following types of assessment:

- baseline assessment;
- diagnostic assessment;
- formative assessment; and
- summative assessment.

Baseline assessment

Baseline assessment is important at the start of a grade, but can occur at the beginning of any learning cycle. It is used to establish what learners already know and can do. It helps in the planning of activities and in Learning Programme development. The recording of baseline assessment is usually informal.

Diagnostic assessment

Any assessment can be used for diagnostic purposes – that is, to discover the cause or causes of a learning barrier. Diagnostic assessment assists in deciding on support strategies or identifying the need for professional help or remediation. It acts as a checkpoint to help redefine the Learning Programme goals, or to discover what learning has not taken place so as to put intervention strategies in place.

Formative assessment

Any form of assessment that is used to give feedback to the learner is fulfilling a formative purpose. Formative assessment is a crucial element of teaching and learning. It monitors and supports the learning process. All stakeholders use this type of assessment to acquire information on the progress of learners. Constructive feedback is a vital component of assessment for formative purposes.

Summative assessment

When assessment is used to record a judgement of the competence or performance of the learner, it serves a summative purpose. Summative assessment gives a picture of a learner's competence or progress at any specific moment. It can occur at the end of a single learning activity, a unit, cycle, term, semester or year of learning. Summative assessment should be planned and a variety of assessment instruments and strategies should be used to enable learners to demonstrate competence.

WHAT SHOULD ASSESSMENT BE AND DO?

Assessment should:

- be understood by the learner and by the broader public;
- be clearly focused;
- be integrated with teaching and learning;
- be based on the pre-set criteria of the Assessment Standards;
- allow for expanded opportunities for learners;
- be learner-paced and fair; and
- be flexible;
- use a variety of instruments;
- use a variety of methods.

HOW TO ASSESS

Teachers' assessment of learners' performances must have a great degree of reliability. This means that teachers' judgements of learners' competences should be generalisable across different times, assessment items and markers. The judgements made through assessment should also show a great degree of validity; that is, they should be made on the aspects of learning that were assessed.

Because each assessment cannot be totally valid or reliable by itself, decisions on learner progress must be based on more than one assessment. This is the principle behind continuous assessment (CASS). Continuous assessment is a strategy that bases decisions about learning on a range of different assessment activities and events that happen at different times throughout the learning process. It involves assessment activities that are spread throughout the year, using various kinds of assessment instruments and methods such as tests, examinations, projects and assignments. Oral, written and performance assessments are included. The different pieces of evidence that learners produce as part of the continuous assessment process can be included in a portfolio. Different subjects have different requirements for what should be included in the portfolio. The Learning Programme Guidelines discuss these requirements further.

Continuous assessment is both classroom-based and school-based, and focuses on the ongoing manner in which assessment is integrated into the process of teaching and learning. Teachers get to know their learners through their day-to-day teaching, questioning, observation, and through interacting with the learners and watching them interact with one another.

Continuous assessment should be applied both to sections of the curriculum that are best assessed through written tests and assignments and those that are best assessed through other methods, such as by performance, using practical or spoken evidence of learning.

METHODS OF ASSESSMENT

Self-assessment

All Learning Outcomes and Assessment Standards are transparent. Learners know what is expected of them. Learners can, therefore, play an important part, through self-assessment, in 'pre-assessing' work before the teacher does the final assessment. Reflection on one's own learning is a vital component of learning.

Peer assessment

Peer assessment, using a checklist or rubric, helps both the learners whose work is being assessed and the learners who are doing the assessment. The sharing of the criteria for assessment empowers learners to evaluate their own and others' performances.

Group assessment

The ability to work effectively in groups is one of the Critical Outcomes. Assessing group work involves looking for evidence that the group of learners co-operate, assist one another, divide work, and combine individual contributions into a single composite assessable product. Group assessment looks at process as well as product. It involves assessing social skills, time management, resource management and group dynamics, as well as the output of the group.

METHODS OF COLLECTING ASSESSMENT EVIDENCE

There are various methods of collecting evidence. Some of these are discussed below.

Observation-based assessment

Observation-based assessment methods tend to be less structured and allow the development of a record of different kinds of evidence for different learners at different times. This kind of assessment is often based on tasks that require learners to interact with one another in pursuit of a common solution or product. Observation has to be intentional and should be conducted with the help of an appropriate observation instrument.

Test-based assessment

Test-based assessment is more structured, and enables teachers to gather the same evidence for all learners in

the same way and at the same time. This kind of assessment creates evidence of learning that is verified by a specific score. If used correctly, tests and examinations are an important part of the curriculum because they give good evidence of what has been learned.

Task-based assessment

Task-based or performance assessment methods aim to show whether learners can apply the skills and knowledge they have learned in unfamiliar contexts or in contexts outside of the classroom. Performance assessment also covers the practical components of subjects by determining how learners put theory into practice. The criteria, standards or rules by which the task will be assessed are described in rubrics or task checklists, and help the teacher to use professional judgement to assess each learner's performance.

RECORDING AND REPORTING

Recording and reporting involves the capturing of data collected during assessment so that it can be logically analysed and published in an accurate and understandable way.

Methods of recording

There are different methods of recording. It is often difficult to separate methods of recording from methods of evaluating learners' performances.

The following are examples of different types of recording instruments:

■ rating scales;
■ task lists or checklists; and
■ rubrics.

Each is discussed below.

Rating scales

Rating scales are any marking system where a symbol (such as A or B) or a mark (such as 5/10 or 50%) is defined in detail to link the coded score to a description of the competences that are required to achieve that score. The detail is more important than the coded score in the process of teaching and learning, as it gives learners a much clearer idea of what has been achieved and where and why their learning has fallen short of the target. Traditional marking tended to use rating scales without the descriptive details, making it difficult to have a sense of the learners' strengths and weaknesses in terms of intended outcomes. A six-point scale of achievement is used in the National Curriculum Statement Grades 10 – 12 (General).

Task lists or checklists

Task lists or checklists consist of discrete statements describing the expected performance in a particular task. When a particular statement (criterion) on the checklist can be observed as having been satisfied by a learner during a performance, the statement is ticked off. All the statements that have been ticked off on the list (as criteria that have been met) describe the learner's performance. These checklists are very useful in peer or group assessment activities.

Rubrics

Rubrics are a combination of rating codes and descriptions of standards. They consist of a hierarchy of standards with benchmarks that describe the range of acceptable performance in each code band. Rubrics require teachers to know exactly what is required by the outcome. Rubrics can be holistic, giving a global picture of the standard required, or analytic, giving a clear picture of the distinct features that make up the criteria, or can combine both. The Learning Programme Guidelines give examples of subject-specific rubrics.

To design a rubric, a teacher has to decide the following:

- Which outcomes are being targeted?
- Which Assessment Standards are targeted by the task?
- What kind of evidence should be collected?
- What are the different parts of the performance that will be assessed?
- What different assessment instruments best suit each part of the task (such as the process and the product)?
- What knowledge should be evident?
- What skills should be applied or actions taken?
- What opportunities for expressing personal opinions, values or attitudes arise in the task and which of these should be assessed and how?
- Should one rubric target all the Learning Outcomes and Assessment Standards of the task or does the task need several rubrics?
- How many rubrics are, in fact, needed for the task?

It is crucial that a teacher shares the rubric or rubrics for the task with the learners before they do the required task. The rubric clarifies what both the learning and the performance should focus on. It becomes a powerful tool for self-assessment.

Reporting performance and achievement

Reporting performance and achievement informs all those involved with or interested in the learner's progress. Once the evidence has been collected and interpreted, teachers need to record a learner's achievements. Sufficient summative assessments need to be made so that a report can make a statement about the standard achieved by the learner.

The National Curriculum Statement Grades 10 – 12 (General) adopts a six-point scale of achievement. The scale is shown in Table 4.1.

Table 4.1   Scale of achievement for the National Curriculum Statement Grades 10 – 12 (General)

Rating Code	Description of Competence	Marks (%)
6	Outstanding	80-100
5	Meritorious	60-79
4	Satisfactory	50-59
3	Adequate	40-49
2	Partial	30-39
1	Inadequate	0-29

SUBJECT COMPETENCE DESCRIPTIONS

To assist with benchmarking the achievement of Learning Outcomes in Grades 10 – 12, subject competences have been described to distinguish the grade expectations of what learners must know and be able to achieve. Six levels of competence have been described for each subject for each grade. These descriptions will assist teachers to assess learners and place them in the correct rating. The descriptions summarise the Learning Outcomes and the Assessment Standards, and give the distinguishing features that fix the achievement for a particular rating. The various achievement levels and their corresponding percentage bands are as shown in Table 4.1.

In line with the principles and practice of outcomes-based assessment, all assessment – both school-based and external – should primarily be criterion-referenced. Marks could be used in evaluating specific assessment tasks, but the tasks should be assessed against rubrics instead of simply ticking correct answers and awarding marks in terms of the number of ticks. The statements of competence for a subject describe the minimum skills, knowledge, attitudes and values that a learner should demonstrate for achievement on each level of the rating scale.

When teachers/assessors prepare an assessment task or question, they must ensure that the task or question addresses an aspect of a particular outcome. The relevant Assessment Standard or Standards must be used when creating the rubric for assessing the task or question. The descriptions clearly indicate the minimum level of attainment for each category on the rating scale.

The competence descriptions for this subject appear at the end of this chapter.

PROMOTION

Promotion at Grade 10 and Grade 11 level will be based on internal assessment only, but must be based on the same conditions as those for the Further Education and Training Certificate. The requirements, conditions, and rules of combination and condonation are spelled out in the *Qualifications and Assessment Policy Framework for the Grades 10 – 12 (General)*.

WHAT REPORT CARDS SHOULD LOOK LIKE

There are many ways to structure a report card, but the simpler the report card the better, provided that all important information is included. Report cards should include information about a learner's overall progress, including the following:

- the learning achievement against outcomes;
- the learner's strengths;
- the support needed or provided where relevant;
- constructive feedback commenting on the performance in relation to the learner's previous performance and the requirements of the subject; and
- the learner's developmental progress in learning how to learn.

In addition, report cards should include the following:

- name of school;
- name of learner;
- learner's grade;
- year and term;
- space for signature of parent or guardian;
- signature of teacher and of principal;
- date;
- dates of closing and re-opening of school;
- school stamp; and
- school attendance profile of learner.

ASSESSMENT OF LEARNERS WHO EXPERIENCE BARRIERS TO LEARNING

The assessment of learners who experience any barriers to learning will be conducted in accordance with the recommended alternative and/or adaptive methods as stipulated in the *Qualifications and Assessment Policy Framework for Grades 10 – 12 (General)* as it relates to learners who experience barriers to learning. *Refer to White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System.*

Grade 10

C Code   S Scale

Cd Competence Descriptions

6

80%-100%
Outstanding

By the end of Grade 10 the learner with outstanding achievement can:

■ demonstrate a thorough knowledge and understanding of relevant computer hardware and software, and the aims and objectives of networked environments;

■ show competence in installing, configuring and trouble shooting simple end-user computer-related hardware and software problems;

■ efficiently develop and maintain multi-level organisational structures in multiple storage media when dealing with files and folders;

■ debate legal, ethical and security issues related to information technology;

■ debate issues related to the impact of information and communication technologies on the local environment and society;

■ input data in a productive fashion to accomplish a high degree of proficiency and level of accuracy;

■ demonstrate creative use of word processing techniques in various contexts to produce professional documents;

■ work independently to produce solutions to various problems using the knowledge and skills of a spreadsheet programme;

■ independently apply creative thinking in a variety of contexts in the end-user computer applications environment using techniques of integration;

■ independently review and edit to produce high-quality documents;

Grade 11

Cd Competence Descriptions

By the end of Grade 11 the learner with outstanding achievement can:

- investigate and analyse relevant computer hardware, software and local area network environments;
- be highly competent in trouble shooting end-user computer-related hardware and software problems in a variety of contexts;
- demonstrate an advanced level of proficiency in developing and maintaining multi-level organisational structures of files and folders;
- make an informed judgement relating to current legal, ethical and security issues related to information technology;
- consider issues relating to the impact of information and communication technologies on the environment and society in a national context;
- input data in a productive fashion to accomplish a very high degree of proficiency and level of accuracy;
- demonstrate creative use of advanced word processing techniques in various contexts to produce professional documents;
- independently apply knowledge and skills of a spreadsheet programme in various contexts in familiar scenarios;
- apply knowledge and skills of a database programme in various contexts;

Grade 12

Cd Competence Descriptions

By the end of Grade 12 the learner with outstanding achievement can:

- critically evaluate relevant computer hardware, software and wide area network environments in an independent fashion;
- demonstrate a mastery in trouble shooting end-user computer-related hardware and software problems in a variety of contexts;
- efficiently implement all the skills on an advanced level related to file handling and organisational structures in multiple storage media;
- critically analyse and evaluate current legal, ethical and security issues related to information technology in an independent fashion;
- critically comment on the impact of information and communication technologies on the environment and society in a global context;
- master the input of data in a productive fashion to accomplish an outstanding degree of proficiency and near-perfect level of accuracy;
- demonstrate creative use of advanced word processing techniques in various contexts to produce professional documents in an independent fashion;
- work independently to produce solutions to various unfamiliar problems using the knowledge and skills of a spreadsheet programme;
- work independently to produce complete database solutions in both familiar and unfamiliar scenarios;

Grade 10

C Code   **S** Scale

6   **80%-100%**
Outstanding
(continued)

Cd Competence Descriptions

- independently select and use appropriate modes and tools to effect communication in a competent fashion;
- make informed decisions when conducting searches for information to produce relevant results using organisational systems and tools;
- analyse and organise information;
- logically formulate and organise responses to present and communicate information using appropriate techniques in a professional fashion.

Grade 11

Cd Competence Descriptions

- independently demonstrate advanced knowledge and creative skills in various contexts using any end-user computer application programme other than word processing, spreadsheet or database programmes;
- independently apply creative thinking to respond to challenges in dynamic and complex situations in a variety of contexts in the end-user computer applications environment using techniques of integration;
- apply critical thinking when reviewing and editing documents in an independent fashion;
- effectively communicate information by independently selecting and using appropriate communication modes and tools in an independent fashion;
- conduct efficient searches for information to produce a manageable set of relevant results using a variety of tools and techniques;
- analyse, synthesise and organise information from multiple sources;
- use computer applications as appropriate to present and communicate information in a logical and professional fashion.

Grade 12

Cd Competence Descriptions

- demonstrate extensive knowledge and creative skills in various contexts using any end-user computer application programme other than word processing, spreadsheet or database programmes in an independent fashion;
- independently apply creative thinking in a variety of complex familiar and unfamiliar contexts in the end-user computer applications environment using techniques of integration;
- independently apply critical thinking in reviewing and editing documents to produce highly professional documents;
- select and use appropriate modes and tools to effect communication in a highly competent fashion;
- demonstrate critical thinking and make informed decisions as to the location, selection and appropriateness of a data source;
- critically analyse, synthesise, evaluate and organise information from multiple sources;
- use advanced techniques in specialised computer applications as appropriate to present and communicate information in a clear, concise and professional fashion.

Grade 10

C Code   **S** Scale

5

60%-79%
Meritorious

Cd Competence Descriptions

By the end of Grade 10 the learner with meritorious achievement can:

■ demonstrate an understanding of relevant computer hardware and software, and the aims and objectives of networked environments;
■ demonstrate understanding in installing, configuring and basic trouble shooting simple end-user computer-related hardware and software problems;
■ manipulate files and folders adequately;
■ discuss legal, ethical and security issues related to information technology;
■ explain and illustrate issues related to the impact of information and communication technologies on the local environment and society;
■ apply productive methods, procedures and techniques to accurately input data;
■ apply advanced word processing techniques in various contexts;
■ apply knowledge and skills of a spreadsheet programme in various contexts;
■ apply creative thinking to respond to challenges in various situations and contexts in the end-user computer applications environment using techniques of integration;
■ display a high degree of competence in reviewing and editing documents;
■ effectively communicate information by independently selecting and using appropriate communication modes and tools;

Grade 11

Cd Competence Descriptions

By the end of Grade 11 the learner with meritorious achievement can:

- demonstrate a thorough knowledge and understanding of relevant computer hardware, software and local area network environments;
- competently trouble shoot simple end-user computer-related hardware and software problems;
- successfully locate files and folders using multiple criteria when manipulating files and folders;
- debate legal, ethical and security issues related to information technology;
- debate issues related to the impact of information and communication technologies on the environment and society in a national context;
- input data in a productive fashion to accomplish a high degree of proficiency and level of accuracy;
- demonstrate creative use of advanced word processing techniques in various contexts;
- use logical functions and formulae to process data and create and edit charts in a spreadsheet programme by applying appropriate techniques;
- apply knowledge and skills of a database programme in various contexts;
- demonstrate advanced knowledge and creative skills in various contexts using any end-user computer application programme other than word processing, spreadsheet or database programmes;

Grade 12

Cd Competence Descriptions

By the end of Grade 12 the learner with meritorious achievement can:

- investigate and analyse relevant computer hardware, software and wide area network environments and is highly competent in trouble shooting end-user computer-related hardware and software problems in a variety of contexts;
- be highly competent in trouble shooting end-user computer-related hardware and software problems in a variety of contexts;
- demonstrate an advanced level of proficiency in developing and maintaining multi-level organisational structures of files and folders;
- make an informed judgement relating to current legal, ethical and security issues related to information technology;
- make an informed judgement relating to the impact of information and communication technologies on the environment and society in a global context;
- input data in a productive fashion to accomplish a very high degree of proficiency and level of accuracy to produce documents of a professional standard;
- demonstrate creative use of advanced word processing techniques in various contexts to produce professional documents;
- apply extensive knowledge and skills of a spreadsheet programme in various contexts;
- apply knowledge and skills of a database programme in various contexts in familiar scenarios;

Grade 10

C Code   **S** Scale

Cd Competence Descriptions

5   **60%-79%**
Meritorious
(continued)

- conduct efficient searches for information to produce relevant results using organisational systems and tools;
- apply logical thinking skills when processing and classifying information;
- formulate responses, and present and communicate information in a professional fashion.

Grade 11

Cd Competence Descriptions

- demonstrate the ability to utilise advanced integration techniques using appropriate programmes in a variety of contexts;
- use initiative to apply written and electronic reviewing and editing instructions to produce accurate and professional output;
- effectively communicate information by using a variety of communication modes and tools with a degree of autonomy;
- make informed decisions in the data collection process when conducting searches for information to produce relevant results using organisational systems and tools;
- analyse and organise information;
- logically formulate and organise responses to present and communicate information using appropriate techniques in a professional fashion.

Grade 12

Cd Competence Descriptions

- demonstrate advanced knowledge and creative skills in various contexts using any end-user computer application programme other than word processing, spreadsheet or database programmes in an independent fashion;
- apply creative thinking to respond to challenges in dynamic and complex situations in a variety of contexts in the end-user computer applications environment using techniques of integration;
- apply critical thinking in reviewing and editing documents;
- effectively communicate information by independently selecting and using appropriate communication modes and tools;
- conduct efficient searches for information to produce a manageable set of relevant results using a variety of tools and techniques;
- analyse, synthesise and organise information from multiple sources;
- use computer applications as appropriate to present and communicate information in a logical and professional fashion.

Grade 10

C Code   S Scale

4

50%-59%
Satisfactory

Cd Competence Descriptions

By the end of Grade 10 the learner with satisfactory achievement can:

- demonstrate a knowledge of the fundamental concepts of relevant computer hardware and software, and the aims and objectives of networked environments;
- install, configure and use input and output devices competently;
- develop and maintain multi-level organisational structures in multiple storage media;
- identify, describe and illustrate legal, ethical and security issues related to information technology;
- discuss issues related to the impact of information and communication technologies on the local environment and society;
- use essential procedures, techniques and operations in the accurate input of data;
- enter, edit and format text, numerical data and graphics using advanced techniques in a word processing programme;
- use functions and formulae to process data and in a spreadsheet programme by applying appropriate techniques;
- demonstrate the ability to utilise advanced integration techniques using appropriate programmes;
- use written editing instructions to produce professional output;
- communicate information by using a variety of communication modes and tools;

Grade 11

Cd Competence Descriptions

By the end of Grade 11 the learner with satisfactory achievement can:

- discuss relevant computer hardware, software and local area network environments;
- demonstrate understanding in trouble shooting simple end-user computer-related hardware and software problems;
- adequately manipulate files and folders;
- identify, describe and value legal, ethical and security issues related to information technology;
- identify, value and discuss issues related to the impact of information and communication technologies on the environment and society in a national context;
- apply productive methods, procedures and techniques to input data accurately;
- apply advanced word processing techniques in various contexts;
- apply knowledge and skills of a spreadsheet programme in various contexts;
- use a database programme to generate more complex forms, queries and reports;
- apply knowledge and skills in various contexts by using any end-user computer application programme other than word processing, spreadsheet or database programmes;
- apply logical thinking to respond to challenges in a variety of contexts in the end-user computer application environment using techniques of integration;

Grade 12

Cd Competence Descriptions

By the end of Grade 12 the learner with satisfactory achievement can:

- demonstrate a thorough knowledge and understanding of relevant computer hardware, software and wide area network environments;
- show competence in trouble shooting simple end-user computer-related hardware and software problems;
- successfully locate files and folders using multiple criteria when manipulating files and folders;
- debate legal, ethical and security issues related to information technology;
- debate issues related to the impact of information and communication technologies on the environment and society in a global context;
- input data in a productive fashion to accomplish a high degree of proficiency and level of accuracy;
- demonstrate the creative use of advanced word processing techniques in various contexts;
- use logical functions and formulae to process data;
- create and edit charts in a spreadsheet programme by applying appropriate techniques;
- use a database programme to generate more complex forms, queries and reports;
- demonstrate advanced knowledge and creative skills in various contexts using any end-user computer application programme other than word processing, spreadsheet or database programmes;

Grade 10

C Code   **S** Scale

| 4 | 50%-59% **Satisfactory** (continued) |

Cd Competence Descriptions

- use technologies to locate, collect and analyse various forms of data using relevant methods;
- organise, record and summarise information in appropriate electronic formats;
- present and communicate information in appropriate formats.

Grade 11

Cd Competence Descriptions

- interpret written and electronic layout and editing instructions to produce accurate output in a competent fashion;
- communicate information effectively by selecting and using appropriate communication modes and tools;
- conduct efficient searches for information to produce relevant results using organisational systems and tools;
- apply logical thinking skills when processing and classifying information;
- formulate responses, and present and communicate information in a professional fashion.

Grade 12

Cd Competence Descriptions

- show the ability to utilise advanced integration techniques using appropriate programmes;
- demonstrate the ability to utilise advanced integration techniques using appropriate programmes in a variety of contexts;
- use initiative to apply written and electronic reviewing and editing instructions to produce accurate and professional output;
- effectively communicate information by using a variety of communication modes and tools with a degree of autonomy;
- make informed decisions in the data collection process when conducting searches for information to produce relevant results using organisational systems and tools;
- analyse and organise information;
- logically formulate and organise responses to present and communicate information using appropriate techniques in a professional fashion.

Grade 10

C Code S Scale

3 **40%-49%**
Adequate

Cd Competence Descriptions

By the end of Grade 10 the learner with adequate achievement can:

■ briefly describe the basic operation and terminology of relevant computer hardware and software, and the aims and objectives of networked environments;

■ install, configure and use input and output devices;

■ describe the concept of file organisation in multi-level directories;

■ identify legal, ethical and security issues related to information technology;

■ describe certain basic issues related to the impact of information and communication technologies on the local environment and society;

■ demonstrate a basic level of competence and accuracy in the input of data;

■ enter, edit and format text, numerical data and graphics using basic techniques in a word processing programme;

■ enter, edit and format text and numerical data using basic functions and formulae in a spreadsheet programme by applying appropriate techniques;

■ demonstrate the ability to utilise basic integration techniques using word processing and spreadsheet programmes;

■ interpret written layout and editing instructions to produce accurate output;

■ demonstrate an understanding of a variety of communication modes and tools;

Grade 11

Cd Competence Descriptions

By the end of Grade 11 the learner with adequate achievement can:

- report on relevant computer hardware, software and local area networks;
- use suitable utility software to carry out basic trouble-shooting functions;
- develop and maintain multi-level organisational structures in multiple storage media;
- discuss legal, ethical and security issues related to information technology;
- describe the impact of information and communication technologies on the environment and society in a national context;
- use essential procedures, techniques and operations in the accurate input of data;
- enter, edit and format text, numerical data and graphics using advanced techniques in a word processing programme;
- use logical functions and formulae to process data and create and edit charts in a spreadsheet programme by applying appropriate techniques;
- create a single table data source, and generate simple forms, queries and reports using a database programme;
- enter, edit and process text, numerical data and/or graphics in any end-user computer application programme other than word processing, spreadsheet or database programmes;
- demonstrate the ability to utilise advanced integration techniques using appropriate programmes;

Grade 12

Cd Competence Descriptions

By the end of Grade 12 the learner with adequate achievement can:

- demonstrate a knowledge of relevant computer hardware, software and wide area network environments;
- demonstrate an understanding of trouble shooting simple end-user computer-related hardware and software problems;
- adequately manipulate files and folders;
- identify, describe and illustrate legal, ethical and security issues related to information technology;
- identify, discuss, value and illustrate issues related to the impact of information and communication technologies on the environment and society in a global context;
- apply productive methods, procedures and techniques to accurately input data;
- apply advanced word processing techniques in various contexts;
- apply knowledge and skills of a spreadsheet programme in various contexts;
- apply knowledge and skills of a database programme in various contexts;
- apply knowledge and skills in various contexts by using any end-user computer application programme other than word processing, spreadsheet or database programmes;
- apply logical thinking to respond to challenges in a variety of contexts in the end-user computer application environment using techniques of integration;

Grade 10

C Code   **S** Scale

Cd Competence Descriptions

3

40%-49%
Adequate
(continued)

- ■ use technologies to locate and collect specific data using relevant methods;
- ■ extract and record information in appropriate electronic formats;
- ■ present and communicate information in electronic formats.

Grade 11

Cd Competence Descriptions

- use written and simple electronic reviewing and editing instructions to produce accurate output;
- effectively communicate information by using a variety of communication modes and tools;
- locate, collect and analyse various forms of data using relevant methods;
- organise, record and summarise information in appropriate electronic formats;
- present and communicate information in appropriate formats.

Grade 12

Cd Competence Descriptions

- interpret written and electronic layout and editing instructions to produce accurate output in a competent fashion;
- communicate information effectively by selecting and using appropriate communication modes and tools;
- make informed decisions in the data collection process;
- apply logical thinking skills when processing and classifying information;
- formulate responses, and present and communicate information in a professional fashion.

Grade 10

C Code   S Scale

2

30%-39%
Partial

Cd Competence Descriptions

By the end of Grade 10 the learner with partial achievement can:

- list relevant computer hardware and software, and the aims and objectives of networked environments;
- install and use input and output devices but with assistance;
- display a limited knowledge of the concepts of file organisation;
- identify certain common legal, ethical and security issues related to information technology;
- recognise certain basic issues related to the impact of information and communication technologies on the local environment and society;
- apply methods, procedures and techniques to input data but with a number of errors;
- use a limited number of the basic techniques in a word processing programme to enter, edit and format text, numerical data and graphics;
- use simple functions and formulae to process data in a spreadsheet programme, but needs guidance;
- use basic integration techniques using word processing and spreadsheet programmes, but with guidance;
- partially interpret written layout and editing instructions to produce output;
- demonstrate some knowledge of communication modes and tools;

Grade 11

Cd Competence Descriptions

By the end of Grade 11 the learner with partial achievement can:

- name relevant concepts related to computer hardware, software and local area network environments;
- only identify end-user computer-related hardware and software problems;
- describe the concept of file organisation in multi-level directories;
- identify common legal, ethical and security issues related to information technology;
- show a limited perspective on issues related to the impact of information and communication technologies on the environment and society in a national context;
- input data, but with a low level of accuracy;
- with assistance, use the advanced techniques in a word processing programme to enter, edit and format text, numerical data and graphics;
- with guidance, use logical functions and formulae to process data and edit charts in a spreadsheet programme;
- with guidance, use a single table data source to generate simple forms and queries using a database programme;
- with assistance, enter and edit text, numerical data and/or graphics in any end-user computer application programme other than word processing, spreadsheet or database programmes;

Grade 12

Cd Competence Descriptions

By the end of Grade 12 the learner with partial achievement can:

- discuss relevant computer hardware, software and wide area network environments;
- demonstrate a knowledge of trouble shooting simple end-user computer-related hardware and software problems;
- maintain multi-level organisational structures in multiple storage media;
- show a limited perspective on issues involving legal, ethical and security issues related to information technology;
- know what issues relate to the impact of information and communication technologies on the environment and society in a global context;
- use essential procedures, techniques and operations in the accurate input of data;
- enter, edit and format text, numerical data and graphics using advanced techniques in a word processing programme;
- use logical functions and formulae to process data and create and edit charts in a spreadsheet programme by applying appropriate techniques;
- use a single table data source to generate simple forms and queries using a database programme;
- with some guidance, enter, edit and process text, numerical data and/or graphics in any end-user computer application programme other than word processing, spreadsheet or database programmes;
- with some guidance, use a limited number of basic integration techniques using word processing and spreadsheet programmes;

Grade 10

C Code   **S** Scale

Cd Competence Descriptions

2

30%-39%
Partial
(continued)

- locate and select specific data, but needs assistance;
- extract and record information, but with support;
- present and communicate information in electronic formats, but needs guidance to do so.

Grade 11

Cd Competence Descriptions

- use very basic integration techniques using word processing and spreadsheet programmes but with extensive guidance;
- partially interpret written and electronic layout and editing instructions;
- demonstrate some understanding of a limited number of communication modes and tools;
- use technologies to locate and collect specific data using relevant methods;
- extract and record information in appropriate electronic formats;
- present and communicate information in electronic formats.

Grade 12

Cd Competence Descriptions

- partially interpret written and electronic layout and editing instructions to produce accurate output;
- demonstrate an understanding of a variety of communication modes and tools;
- use technologies to locate and collect various forms of data using relevant methods;
- organise, record and summarise information in appropriate formats;
- present and communicate information in appropriate formats.

Grade 10

C Code   S Scale

1

0%-29%
Inadequate

Cd Competence Descriptions

By the end of Grade 10 the learner with inadequate achievement can:

- show very limited knowledge of relevant computer hardware and software, and the aims and objectives of networked environments;
- only use input and output devices with assistance;
- not distinguish between rudimentary concepts of file organisation;
- only be aware of basic issues involving legal, ethical and security issues related to information technology;
- only be aware of basic issues related to the impact of information and communication technologies on the local environment and society;
- input data, but with an extremely low level of accuracy;
- use the basic techniques in a word processing programme to enter, edit and format text, numerical data and graphics, but needs considerable assistance to do so;
- use simple functions and formulae to process data in a spreadsheet programme, but needs extensive guidance to do so;
- not apply integration techniques using word processing and spreadsheet programmes;
- interpret written layout and editing instructions, but struggles to do so;
- show very limited knowledge of communication modes and tools;

Grade 11

Cd Competence Descriptions

By the end of Grade 11 the learner with inadequate achievement can:

- show very limited knowledge of relevant computer hardware, software and local area network environments;
- show a very limited ability to identify and trouble shoot end-user computer hardware and software related problems;
- display a limited knowledge of file organisation;
- name issues involving legal, ethical and security issues related to information technology;
- name issues related to the impact of information and communication technologies on the environment and society in a national context;
- input data but with a very low level of accuracy;
- use the advanced techniques in a word processing programme to enter, edit and format text, numerical data and graphics, but with considerable assistance;
- use simple functions and formulae to process data and edit very simple charts in a spreadsheet programme, but with extensive guidance;
- use a single table data source to generate simple forms and queries using a database programme, but with extensive guidance;
- enter and edit text, numerical data and/or graphics in any end-user computer application programme other than word processing, spreadsheet or database programmes, but with extensive guidance;

Grade 12

Cd Competence Descriptions

By the end of Grade 12 the learner with inadequate achievement can:

- show very limited knowledge of relevant computer hardware, software and wide area network environments;
- only identify end-user computer-related hardware and software problems;
- describe the concept of file organisation in multi-level directories;
- show a limited perspective on issues involving legal, ethical and security issues related to information technology;
- show a limited perspective on issues related to the impact of information and communication technologies on the environment and society in a global context;
- input data, but with a low level of accuracy;
- use the advanced techniques in a word processing programme to enter, edit and format text, numerical data and graphics, but needs assistance to do so;
- with guidance, use logical functions and formulae to process data and edit charts in a spreadsheet programme;
- with guidance, use a single table data source to generate simple forms and queries using a database programme;
- with assistance, enter and edit text, numerical data and/or graphics in any end-user computer application programme other than word processing, spreadsheet or database programmes;

Grade 10

C Code **S** Scale **Cd** Competence Descriptions

1

**0%-29%
Inadequate
(continued)**

- locate and select data, but requires close supervision;
- depend on others to extract and record information;
- demonstrate a very narrow range of skills in order to present and communicate information.

Grade 11

Cd Competence Descriptions

■ use basic integration techniques using only word processing and spreadsheet programmes, but with guidance;

■ interpret written and electronic layout and editing instructions to produce output, but struggles;

■ demonstrate some knowledge of communication modes and tools;

■ locate and select specific data, but needs assistance;

■ extract and record information, but needs support;

■ present and communicate information in electronic formats, but needs guidance.

Grade 12

Cd Competence Descriptions

■ use very basic integration techniques using only word processing and spreadsheet programmes, but requires extensive guidance;

■ interpret written and electronic layout and editing instructions, but struggles to do so;

■ demonstrate some understanding of a limited number of communication modes and tools;

■ use technologies to locate and collect specific data using relevant methods;

■ extract and record information in appropriate electronic formats;

■ present and communicate information in electronic formats.

GLOSSARY

argument – to develop ideas; a line of reasoning

communication mode – method of communication, including both electronic and non-electronic methods (e.g. e-mail, fax, courier)

communication tool – any type of hardware or software capable of transmitting data and information

computer ethics – moral guidelines that govern the use of computers and information systems

computer security – methods or systems to prevent any event or action that could cause a loss of or damage to computer hardware, software, data and information

computer virus – a potentially damaging computer programme that affects or infects a computer negatively by altering the way the computer works, without the user's knowledge or permission

data collection (methods of) – questionnaires, data collection forms, requests for information, information surveys, literature surveys

electronic communication – use of e-mail (e.g. attachments, digital signatures, address books); Internet browsers (e.g. searching), or group communications (e.g. chat rooms, IRC, newsgroups, discussion boards, mailing lists, web pages, FTP)

electronic office environment – a system that is designed to increase productivity and assist with communications, using computers and other electronic devices

electronic storage media – physical material on which a computer keeps data, instructions and information (e.g. hard disks, floppy or stiffy disks, compact disks, DVDs, memory sticks)

end-user – the person who uses computer applications in any environment, as opposed to those who developed or support it

end-user computer application programme – computer software (e.g. word processing, spreadsheets, presentations, database, image processing programme) or Internet browser that perform specific tasks, such as word processing or database management (see also **system software** and **utility software**)

ergonomics – the science concerned with designing safe and comfortable machines for humans. For example, one branch of ergonomics deals with designing furniture that avoids causing backaches and muscle cramps. In the computer field, ergonomics plays an important role in the design of monitors and keyboards. Another term for ergonomics is human engineering.

file – a collection of information, with its own name, that is stored on a computer. Files are used to store text, numbers, graphics, sound or video.

file extension – the portion of a filename, following the final dot, which indicates the kind of data stored in the file

file management – classifying, sorting, organising and storing information in electronic and non-electronic formats

folder – an area of a disk that holds a group of files (also known as 'directory')

format – layout or design of visual or printed matter

information and communication technology – a form of convergence technology including computer technology and communication technology

information management – the procedure of collecting data and processing, presenting and communicating information

information society – the environment in which information and communication technologies play a significant role

information technology – computer hardware and software development

input device – any hardware component that allows the user to enter data, commands and user responses into the computer (e.g. keyboard, mouse, scanner, microphone)

Internet – the biggest computer network in the world, reaching millions of people on thousands of interconnected networks

networked environment – any linked computer system

non-electronic storage media – storage systems in which paper-based documents and other back-up material can be stored

operating system – the master control programme that manages the computer's internal functions (e.g. accepting keyboard input), and provides a means to control the computer's operations and file system. Popular operating systems include Windows, MacOS and Linux.

operational knowledge – the practical application of conceptual knowledge, including obtaining the necessary conceptual knowledge

organisational structures – logical organisation and management of documents, files and/or folders

output device – any hardware component that can convey information from a computer to a user (e.g. printer, monitor, speakers)

productivity – the ability to produce accurate text, numerical data and graphics within a specified time limit

proficiency – the competence, skill and expertise required from the learner

resources – library referencing system, database searches, indices, Internet search engine

storage media – includes non-electronic storage media (paper-based filing) and electronic storage media (e.g. disks, CDs)

system software – computer software that maintains and organises the computer system

utility software – computer software that assists the user in organising, maintaining and improving the efficiency of a computer system