



**education**

Department:  
Education  
REPUBLIC OF SOUTH AFRICA

# **NATIONAL CERTIFICATES (VOCATIONAL)**

## **ASSESSMENT GUIDELINES**

### **COMPUTER HARDWARE AND SOFTWARE NQF Level 3**

September 2007



# COMPUTER HARDWARE AND SOFTWARE – LEVEL 3

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## SECTION A: PURPOSE OF THE SUBJECT ASSESSMENT GUIDELINES

This document provides the lecturer with guidelines to develop and implement a coherent, integrated assessment system for Computer Hardware and Software in the National Certificates (Vocational). It must be read with the *National Policy Regarding Further Education and Training Programmes: Approval of the Documents, Policy for the National Certificates (Vocational) Qualifications at Levels 2 to 4 on the National Qualifications Framework (NQF)*. This assessment guideline will be used for National Qualifications Framework Levels 2-4.

This document explains the requirements for the internal and external subject assessment. The lecturer must use this document with the *Subject Guidelines: Computer Hardware and Software* to prepare for and deliver Computer Hardware and Software. Lecturers should use a variety of resources and apply a range of assessment skills in the setting, marking and recording of assessment tasks.

## SECTION B: ASSESSMENT IN THE NATIONAL CERTIFICATES (VOCATIONAL)

### 1 ASSESSMENT IN THE NATIONAL CERTIFICATES (VOCATIONAL)

Assessment in the National Certificates (Vocational) is underpinned by the objectives of the National Qualifications Framework (NQF). These objectives are to:

- Create an integrated national framework for learning achievements.
- Facilitate access to and progression within education, training and career paths.
- Enhance the quality of education and training.
- Redress unfair discrimination and past imbalances and thereby accelerate employment opportunities.
- Contribute to the holistic development of the student by addressing:
  - social adjustment and responsibility;
  - moral accountability and ethical work orientation;
  - economic participation; and
  - nation-building.

The principles that drive these objectives are:

- **Integration**

To adopt a unified approach to education and training that will strengthen the human resources development capacity of the nation.

- **Relevance**

To be dynamic and responsive to national development needs.

- **Credibility**

To demonstrate national and international value and recognition of qualification and acquired competencies and skills.

- **Coherence**

To work within a consistent framework of principles and certification.

- **Flexibility**

To allow for creativity and resourcefulness when achieving Learning Outcomes, to cater for different learning styles and use a range of assessment methods, instruments and techniques.

- **Participation**

To enable stakeholders to participate in setting standards and co-ordinating the achievement of the qualification.

- **Access**

To address barriers to learning at each level to facilitate students' progress.

- **Progression**

To ensure that the qualification framework permits individuals to move through the levels of the national qualification via different, appropriate combinations of the components of the delivery system.

- **Portability**

To enable students to transfer credits of qualifications from one learning institution and/or employer to another institution or employer.

- **Articulation**

To allow for vertical and horizontal mobility in the education system when accredited pre-requisites have been successfully completed.

- **Recognition of Prior Learning**

To grant credits for a unit of learning following an assessment or if a student possesses the capabilities specified in the outcomes statement.

- **Validity of assessments**

To ensure assessment covers a broad range of knowledge, skills, values and attitudes (SKVAs) needed to demonstrate applied competency. This is achieved through:

- clearly stating the outcome to be assessed;
- selecting the appropriate or suitable evidence;
- matching the evidence with a compatible or appropriate method of assessment; and
- selecting and constructing an instrument(s) of assessment.

- **Reliability**

To assure assessment practices are consistent so that the same result or judgment is arrived at if the assessment is replicated in the same context. This demands consistency in the interpretation of evidence; therefore, careful monitoring of assessment is vital.

- **Fairness and transparency**

To verify that no assessment process or method(s) hinders or unfairly advantages any student. The following could constitute unfairness in assessment:

- Inequality of opportunities, resources or teaching and learning approaches
- Bias based on ethnicity, race, gender, age, disability or social class
- Lack of clarity regarding Learning Outcome being assessed
- Comparison of students' work with other students, based on learning styles and language

- **Practicability and cost-effectiveness**

To integrate assessment practices within an outcomes-based education and training system and strive for cost and time-effective assessment.

## **2 ASSESSMENT FRAMEWORK FOR VOCATIONAL QUALIFICATIONS**

The assessment structure for the National Certificates (Vocational) qualification is as follows:

### **2.1 Internal continuous assessment (ICASS)**

Knowledge, skills values, and attitudes (SKVAs) are assessed throughout the year using assessment instruments such as projects, tests, assignments, investigations, role-play and case studies. The internal continuous assessment (ICASS) practical component is undertaken in a real workplace, a workshop or a "Structured Environment". This component is moderated internally and externally quality assured by Umalusi. All internal continuous assessment (ICASS) evidence is kept in a Portfolio of Evidence (PoE) and must be readily available for monitoring, moderation and verification purposes.

### **2.2 External summative assessment (ESASS)**

The external summative assessment is either a single or a set of written papers set to the requirements of the Subject Learning Outcomes. The Department of Education administers the theoretical component according to relevant assessment policies.

A compulsory component of external summative assessment (ESASS) is the **integrated summative assessment task (ISAT)**. This assessment task draws on the students' cumulative learning throughout the year. The task requires **integrated application of competence** and is executed under strict assessment conditions. The task should take place in a simulated or "Structured Environment". The integrated summative assessment task (ISAT) is the most significant test of students' ability to apply their acquired knowledge.

The integrated assessment approach allows students to be assessed in more than one subject with the same integrated summative assessment task (ISAT).

External summative assessments will be conducted annually between October and December, with provision made for supplementary sittings.

### **3 MODERATION OF ASSESSMENT**

#### **3.1 Internal moderation**

Assessment must be moderated according to the internal moderation policy of the Further Education and Training (FET) college. Internal college moderation is a continuous process. The moderator's involvement starts with the planning of assessment methods and instruments and follows with continuous collaboration with and support to the assessors. Internal moderation creates common understanding of Assessment Standards and maintains these across vocational programmes.

#### **3.2 External moderation**

External moderation is conducted by the Department of Education, Umalusi and, where relevant, an Education and Training Quality Assurance (ETQA) body according to South African Qualifications Authority (SAQA) and Umalusi standards and requirements.

The external moderator:

- monitors and evaluates the standard of all summative assessments;
- maintains standards by exercising appropriate influence and control over assessors;
- ensures proper procedures are followed;
- ensures summative integrated assessments are correctly administered;
- observes a minimum sample of ten (10) to twenty-five (25) percent of summative assessments;
- gives written feedback to the relevant quality assessor; and
- moderates in case of a dispute between an assessor and a student.

Policy on inclusive education requires that assessment procedures for students who experience barriers to learning be customised and supported to enable these students to achieve their maximum potential.

### **4 PERIOD OF VALIDITY OF INTERNAL CONTINUOUS ASSESSMENT (ICASS)**

The period of validity of the internal continuous assessment mark is determined by the *National Policy on the Conduct, Administration and Management of the Assessment of the National Certificates (Vocational)*.

The internal continuous assessment (ICASS) must be re-submitted with each examination enrolment for which it constitutes a component.

### **5 ASSESSOR REQUIREMENTS**

Assessors must be subject specialists and should ideally be declared competent against the standards set by the ETDP SETA. If the lecturer conducting the assessments has not been declared a competent assessor, an assessor who has been declared competent may be appointed to oversee the assessment process to ensure the quality and integrity of assessments.

### **6 TYPES OF ASSESSMENT**

Assessment benefits the student and the lecturer. It informs students about their progress and helps lecturers make informed decisions at different stages of the learning process. Depending on the intended purpose, different types of assessment can be used.

## 6.1 Baseline assessment

At the beginning of a level or learning experience, baseline assessment establishes the knowledge, skills, values and attitudes (SKVAs) that students bring to the classroom. This knowledge assists lecturers to plan learning programmes and learning activities.

## 6.2 Diagnostic assessment

This assessment diagnoses the nature and causes of learning barriers experienced by specific students. It is followed by guidance, appropriate support and intervention strategies. This type of assessment is useful to make referrals for students requiring specialist help.

## 6.3 Formative assessment

This assessment monitors and supports teaching and learning. It determines student strengths and weaknesses and provides feedback on progress. It determines if a student is ready for summative assessment.

## 6.4 Summative assessment

This type of assessment gives an overall picture of student progress at a given time. It determines whether the student is sufficiently competent to progress to the next level.

## 7 PLANNING ASSESSMENT

An assessment plan should cover three main processes:

### 7.1 Collecting evidence

The assessment plan indicates which Subject Outcomes and Assessment Standards will be assessed, what assessment method or activity will be used and when this assessment will be conducted.

### 7.2 Recording

Recording refers to the assessment instruments or tools with which the assessment will be captured or recorded. Therefore, appropriate assessment instruments must be developed or adapted.

### 7.3 Reporting

All the evidence is put together in a report to deliver a decision for the subject.

## 8 METHODS OF ASSESSMENT

Methods of assessment refer to who carries out the assessment and includes lecturer assessment, self-assessment, peer assessment and group assessment.

<b>LECTURER ASSESSMENT</b>	The lecturer assesses students' performance against given criteria in different contexts, such as individual work, group work, etc.
<b>SELF-ASSESSMENT</b>	Students assess their own performance against given criteria in different contexts, such as individual work, group work, etc.
<b>PEER ASSESSMENT</b>	Students assess another student's or group of students' performance against given criteria in different contexts, such as individual work, group work, etc.
<b>GROUP ASSESSMENT</b>	Students assess the individual performance of other students within a group or the overall performance of a group of students against given criteria.

## 9 INSTRUMENTS AND TOOLS FOR COLLECTING EVIDENCE

All evidence collected for assessment purposes is kept or recorded in the student's PoE.

The following table summarises a variety of methods and instruments for collecting evidence. A method and instrument is chosen to give students ample opportunity to demonstrate the Subject Outcome has been attained. This will only be possible if the chosen methods and instruments are appropriate for the target group and the Specific Outcome being assessed.

	METHODS FOR COLLECTING EVIDENCE		
	Observation-based (Less structured)	Task-based (Structured)	Test-based (More structured)
<b>Assessment instruments</b>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Class questions</li> <li>• Lecturer, student, parent discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Assignments or tasks</li> <li>• Projects</li> <li>• Investigations or research</li> <li>• Case studies</li> <li>• Practical exercises</li> <li>• Demonstrations</li> <li>• Role-play</li> <li>• Interviews</li> </ul>	<ul style="list-style-type: none"> <li>• Examinations</li> <li>• Class tests</li> <li>• Practical examinations</li> <li>• Oral tests</li> <li>• Open-book tests</li> </ul>
<b>Assessment tools</b>	<ul style="list-style-type: none"> <li>• Observation sheets</li> <li>• Lecturer's notes</li> <li>• Comments</li> </ul>	<ul style="list-style-type: none"> <li>• Checklists</li> <li>• Rating scales</li> <li>• Rubrics</li> </ul>	<ul style="list-style-type: none"> <li>• Marks (e.g. %)</li> <li>• Rating scales (1-7)</li> </ul>
<b>Evidence</b>	<ul style="list-style-type: none"> <li>• Focus on individual students</li> <li>• Subjective evidence based on lecturer observations and impressions</li> </ul>	<p><b>Open middle:</b> Students produce the same evidence but in different ways.</p> <p><b>Open end:</b> Students use same process to achieve different results.</p>	Students answer the same questions in the same way, within the same time.

## 10 TOOLS FOR ASSESSING STUDENT PERFORMANCE

**Rating scales** are marking systems where a symbol (such as 1 to 7) or a mark (such as 5/10 or 50%) is defined in detail. The detail is as important as the coded score. Traditional marking, assessment and evaluation mostly used rating scales without details such as what was right or wrong, weak or strong, etc.

**Task lists** and **checklists** show the student what needs to be done. These consist of short statements describing the expected performance in a particular task. The statements on the checklist can be ticked off when the student has adequately achieved the criterion. Checklists and task lists are useful in peer or group assessment activities.

**Rubrics** are a hierarchy (graded levels) of criteria with benchmarks that describe the minimum level of acceptable performance or achievement for each criterion. Using rubrics is a different way of assessing and cannot be compared to tests. Each criterion described in the rubric must be assessed separately. Mainly, two types of rubrics, namely holistic and analytical, are used.

## 11 SELECTING AND/OR DESIGNING RECORDING AND REPORTING SYSTEMS

The selection or design of recording and reporting systems depends on the purpose of recording and reporting student achievement. **Why** particular information is recorded and **how** it is recorded determine which instrument will be used.

Computer-based systems, for example spreadsheets, are cost and time effective. The recording system should be user-friendly and information should be easily accessed and retrieved.

## 12 COMPETENCE DESCRIPTIONS

All assessment should award marks to evaluate specific assessment tasks. However, marks should be awarded against rubrics and not be simply a total of ticks for right answers. Rubrics should explain the competence level descriptors for the skills, knowledge, values and attitudes (SKVAs) that a student must demonstrate to achieve each level of the rating scale.

When lecturers or assessors prepare an assessment task or question, they must ensure that the task or question addresses an aspect of a Subject Outcome. The relevant Assessment Standard must be used to create the rubric to assess the task or question. The descriptions must clearly indicate the minimum level of attainment for each category on the rating scale.



## 13 STRATEGIES FOR COLLECTING EVIDENCE

A number of different assessment instruments may be used to collect and record evidence. Examples of instruments that can be (adapted and) used in the classroom include:

### 13.1 Record sheets

The lecturer observes students working in a group. These observations are recorded in a summary table at the end of each project. The lecturer can design a record sheet to observe students' interactive and problem-solving skills, attitudes towards group work and involvement in a group activity.

### 13.2 Checklists

Checklists should have clear categories to ensure that the objectives are effectively met. The categories should describe how the activities are evaluated and against what criteria they are evaluated. Space for comments is essential.

## SECTION C: ASSESSMENT IN COMPUTER HARDWARE AND SOFTWARE

### 1 SCHEDULE OF ASSESSMENT

At NQF levels 2, 3 and 4, lecturers will conduct assessments as well as develop a schedule of formal assessments that will be undertaken in the year. All three levels also have an external examination that accounts for 50 percent of the total mark. The marks allocated to assessment tasks completed during the year, kept or recorded in a PoE account for the other 50 percent.

The PoE and the external assessment include practical and written components. The practical assessment in Computer Hardware and Software must, where necessary, be subjected to external moderation by Umalusi or an appropriate Education and Training Quality Assurance (ETQA) body, appointed by the Umalusi Council in terms of Section 28(2) of the *General and Further Education and Training Quality Assurance Act, 2001 (Act No. 58 of 2001)*.

### 2 RECORDING AND REPORTING

Electronics, Computer Hardware and Software and Data Communication and Networking, as is the case for all the other Vocational subjects, is assessed according to five levels of competence. The level descriptions are explained in the following table.

#### **Scale of Achievement for the Vocational component**

RATING CODE	RATING	MARKS %
5	Outstanding	80-100
4	Highly competent	70-79
3	Competent	50-69
2	Not yet competent	40-49
1	Not achieved	0-39

The programme of assessment should be recorded in the Lecturer's Portfolio of Assessment for each subject. The following at least should be included in the Lecturer's Assessment Portfolio:

- A contents page
- The formal schedule of assessment
- The requirements for each assessment task
- The tools used for each assessment task
- Recording instrument(s) for each assessment task
- A mark sheet and report for each assessment task

The college must standardise these documents.

The student's PoE must include at least:

- A contents page
- The assessment tasks according to the assessment schedule
- The assessment tools or instruments for the task
- A record of the marks (and comments) achieved for each task

Where a task cannot be contained as evidence in the PoE, its exact location must be recorded and it must be readily available for moderation purposes.

The following units of internal assessment must serve as a guide for Computer Hardware and Software:

No. of units	Assessment	Coverage
6	Formal written tests	1 or more completed topics
1	Internal written exam	All completed topics
9	Practical assessments	Must cover the related subject outcomes <ul style="list-style-type: none"><li>• Preventative maintenance, environment and safety issues in a computer environment</li><li>• PC or handheld computer hardware components</li><li>• Assemble a PC or handheld computer and peripherals into modules</li><li>• Install system and application software for a PC or handheld computer</li><li>• Install a PC or handheld computer peripherals</li><li>• Test IT systems against given specifications</li><li>• Resolve computer user's problems</li><li>• Resolve technical computer problems</li><li>• Repair a PC or handheld computer and peripherals to module level</li></ul>

# **ASSESSMENT OF COMPUTER HARDWARE AND SOFTWARE**

## **LEVEL 3**

### 3 INTERNAL ASSESSMENT OF SUBJECT OUTCOMES IN COMPUTER HARDWARE AND SOFTWARE - LEVEL 3

#### Topic 1 Concepts of computer architecture

SUBJECT OUTCOME	
<b>1.1 Explain computer architecture elements.</b> <i>Range includes, but is not limited to: Virtual machine, Hardware, Software, Firmware, Functional levels within a computer (at least 3).</i>	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> <li>The explanation identifies the functions of elements which make up computer architecture.</li> </ul>	<ul style="list-style-type: none"> <li>Identify the functions of elements that make up computer architecture.</li> </ul>
<ul style="list-style-type: none"> <li>The explanation outlines the functions of elements which make up computer architecture.</li> </ul>	<ul style="list-style-type: none"> <li>Outline the functions of the elements that make up computer architecture.</li> </ul>
<ul style="list-style-type: none"> <li>The explanation distinguishes categories of each element and outlines their features.</li> </ul>	<ul style="list-style-type: none"> <li>Distinguish between the categories of each element and outline their features.</li> </ul>
<ul style="list-style-type: none"> <li>The explanation identifies examples of the application of architecture elements.</li> </ul>	<ul style="list-style-type: none"> <li>Identify examples of the application of architecture elements.</li> </ul>
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> <li>Assignments/tasks</li> <li>Investigations/research</li> </ul>	

SUBJECT OUTCOME	
<b>1.2 Explain the organization of a computer.</b> <i>Range includes, but is not limited to: Motherboard, power supply, storage devices, CPU, memory, PC Cards, BIOS, battery, cables and leads (at least 3).</i>	
ASSESSMENT STANDARD	LEARNING OUTCOME
<p>The explanation identifies the purpose of computer components.</p>	<ul style="list-style-type: none"> <li>Identify the purpose of computer components.</li> </ul>
<p>The explanation outlines how components achieve their outcomes in terms of their relationships, and the structure of the computer.</p>	<p>Outline how components achieve their outcomes in terms of their relationships and the structure of the computer.</p>
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> <li>Case studies</li> </ul>	

SUBJECT OUTCOME	
<b>1.3 Describe the design constraints in the design of instruction sets for computers.</b> <i>Range includes, but is not limited to: Instruction length, Memory transfer, Word length, Instruction format, Instruction fetch, Operand specification.</i>	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> <li>Constraints are identified and the issues involved are outlined.</li> </ul>	<ul style="list-style-type: none"> <li>Identify the constraints and outline the issues involved.</li> </ul>
<ul style="list-style-type: none"> <li>The description outlines how the constraints have been accommodated, by using examples.</li> </ul>	<ul style="list-style-type: none"> <li>Outline using examples how the constraints can be accommodated.</li> </ul>
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> <li>Case Studies</li> </ul>	

## Topic 2: Types of computer systems and hardware configurations

SUBJECT OUTCOMES	
<p><b>2.1 Describe past, present and future computer hardware configurations.</b> <i>Range: Stand alone and networked PC's, Mid-range, Mainframes, Client-server, Emerging systems (at least 3).</i></p>	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> <li>The characteristics of the configurations are listed. <i>Range: Single-user, Multi-user</i></li> </ul>	<ul style="list-style-type: none"> <li>List the characteristics of configurations.</li> </ul>
<ul style="list-style-type: none"> <li>The categorization of examples is justified. <i>Range: Single-processor, Multi-processor</i></li> </ul>	<ul style="list-style-type: none"> <li>Justify the categorization of examples.</li> </ul>
<ul style="list-style-type: none"> <li>The performance characteristics of the configurations are explained.</li> </ul>	<ul style="list-style-type: none"> <li>Explain the performance characteristics of the configurations.</li> </ul>
<ul style="list-style-type: none"> <li>The environmental requirements of the configurations are explained.</li> </ul>	<ul style="list-style-type: none"> <li>Explain the environmental requirements of the configurations.</li> </ul>
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> <li>Assignments/Tasks</li> <li>Case Studies</li> </ul>	

SUBJECT OUTCOMES	
<p><b>2.2 Describe the categories of computer system applications.</b> <i>Range includes, but is not limited to: Batch, Interactive, Real time, Process control, scientific, education, home (at least 3).</i></p>	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> <li>The categories of computer system applications are identified.</li> </ul>	<ul style="list-style-type: none"> <li>Identify the categories of computer system applications.</li> </ul>
<ul style="list-style-type: none"> <li>The categorization of examples is justified.</li> </ul>	<ul style="list-style-type: none"> <li>Justify the categorisation of examples.</li> </ul>
<ul style="list-style-type: none"> <li>The performance characteristics of the categories are explained.</li> </ul>	<ul style="list-style-type: none"> <li>Explain the performance characteristics of the categories.</li> </ul>
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> <li>Assignments/Tasks</li> <li>Case Studies</li> </ul>	

## Topic 3: PC or handheld computer hardware components

SUBJECT OUTCOME	
<p><b>3.1 Describe the characteristics of personal computer hardware components.</b></p>	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> <li>The purpose of a component is identified using examples and outlining its functions.</li> </ul>	<ul style="list-style-type: none"> <li>Identify the purpose of a component using examples as well as providing an outline of its functions.</li> </ul>
<ul style="list-style-type: none"> <li>The operating principles of a component are outlined.</li> </ul>	<ul style="list-style-type: none"> <li>Outline the operating principles of a component.</li> </ul>
<ul style="list-style-type: none"> <li>The relationship between the components is outlined by describing the interaction between them.</li> </ul>	<ul style="list-style-type: none"> <li>Outline the relationship between components by describing the interaction between them.</li> </ul>
<ul style="list-style-type: none"> <li>The resources required for the installation are described and are available at the time of the installation and are in working order.</li> </ul>	<ul style="list-style-type: none"> <li>Describe the resources required for the installation and ensure that they are available at the time of installation and are in working order.</li> </ul>
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> <li>Assignments/Tasks</li> <li>Investigations/Research</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>3.2 Compare and select personal computer hardware components.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The comparison allows for performance measures of components to be identified and compared.</li> </ul>	<ul style="list-style-type: none"> <li>• Compare the performance measures of components.</li> </ul>
<ul style="list-style-type: none"> <li>• The relationships between performance and system use are outlined and compared.</li> </ul>	<ul style="list-style-type: none"> <li>• Outline and compare the relationships between performance and system use.</li> </ul>
<ul style="list-style-type: none"> <li>• The available options are compared and the selection of personal computer hardware components justified for a given situation.</li> </ul>	<ul style="list-style-type: none"> <li>• Compare all available options and justify the selection of personal computer hardware components for a given situation.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Practical exercises</li> <li>• Demonstrations</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>3.3 Test personal computer hardware components.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• Tests are completed according to an industry recommended practice.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how to ensure that tests are completed to an industry recommended practice.</li> </ul>
<ul style="list-style-type: none"> <li>• Testing identifies faulty components.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify faulty components through testing.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Investigations/research</li> <li>• Practical exercises</li> <li>• Demonstrations</li> </ul>	

#### **Topic 4: Assemble a PC or handheld computer and peripherals into modules**

<b>SUBJECT OUTCOME</b>	
<b>4.1 Plan the assembly of a single user PC and peripherals.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The feasibility of the planned specification is identified and explained.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and explain the feasibility of the planned specification.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan estimates the effort, duration and resources required for the assembly.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the plan estimates the effort, duration and resources required for assembly.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan adopts a review procedure that ensures that the final outcome meets user requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the plan adopts a review procedure that ensures that the final outcome meets the user requirements.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan ensures that the assembly environment conforms to the manufacturer's specification.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the plan ensures that the assembly environment conforms to the manufacturer's specification.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan ensures that the resources required to complete the assembly are available at the assembly site, and are in working order.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the plan ensures that the resources required to complete the assembly are available at the assembly site, and are in good working order.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Projects</li> <li>• Demonstrations</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>4.2 Assemble a single-user personal computer and peripherals from modules.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>The hardware assembly is assembled according to manufacturer's specification.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate the assembly according to the manufacturer's specification.</li> </ul>
<ul style="list-style-type: none"> <li>The assembly ensures that the hardware completes the manufacturer's diagnostic test free of errors.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how the assembly ensures that the hardware completes the manufacturer's diagnostic test free of errors.</li> </ul>
<ul style="list-style-type: none"> <li>The system and application software are customised and configured according to assembly specifications.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how to customise and configure the system and application software according to assembly specifications.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>Projects</li> <li>Practical exercises</li> <li>Demonstrations</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>4.3 Test single-user PC and peripherals.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>"Burn-in" testing completes free of errors according to the assembly specifications.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate what "burn-in" testing is and ensure that it completes free of errors according to the assembly specifications.</li> </ul>
<ul style="list-style-type: none"> <li>The testing procedure meets manufacturer's guidelines.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate the testing procedure ensuring that it meets manufacturer's guidelines.</li> </ul>
<ul style="list-style-type: none"> <li>The test results are recorded according to organization specifications.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate how test results are recorded according to organization specifications.</li> </ul>
<ul style="list-style-type: none"> <li>The test ensures that system software communicates with the hardware modules in accordance with manufacturer's and assembly specifications.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate how the test ensures that system software communicates with the hardware modules in accordance with the manufacturer's and assembly specifications.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>Projects</li> <li>Practical exercises</li> <li>Demonstrations</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>4.4 Dispatch single-user personal computers and peripherals.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>The dispatch procedure is explained and demonstrated, ensuring that units are packed according to manufacturer and assembly specifications.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate the dispatch procedure ensuring that the units are packed according to manufacturer and assembly specifications.</li> </ul>
<ul style="list-style-type: none"> <li>The dispatch procedure is explained and demonstrated, ensuring that documentation is completed according to manufacturers and organization requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate the dispatch procedure ensuring that the documentation is completed according to manufacturers and organization requirements.</li> </ul>
<ul style="list-style-type: none"> <li>The dispatch procedure is explained and demonstrated, ensuring that units are forwarded according to the assembly specification.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate the dispatch procedure ensuring that the units are forwarded according to the assembly specification.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>Projects</li> <li>Practical exercises</li> <li>Demonstrations</li> </ul>	

**Topic 5: Install system and application software for a PC or handheld computer**

<b>SUBJECT OUTCOME</b>	
<b>5.1 Plan the installation of system software and application software for a single-user personal computer.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The plan reviews the software specification and explains the feasibility of the specification.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the plan reviews the software specification and the feasibility of the specification.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan estimates the time and resources required for the installation, and specifies milestones.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the plan estimates the time and resources required for the installation, and specify any milestones.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan ensures that the installation is scheduled to minimise disruption to the user.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the plan ensures that the installation is scheduled to minimise disruption to the user.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan adopts a review procedure which ensures that the final outcome meets user requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the plan adopts a review procedure which ensures that the final outcome meets user requirements.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Case Studies</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>5.2 Install system software and application software for a single-user personal computer.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The installation procedure follows the publisher's guidelines.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the installation procedure follows the publisher's guidelines.</li> </ul>
<ul style="list-style-type: none"> <li>• The installation ensures that the software operates according to the publisher's specifications.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the installation procedure ensures that the software operates according to the publisher's specifications.</li> </ul>
<ul style="list-style-type: none"> <li>• The installation ensures that the pre-installation environment is restored in the event of an unsuccessful installation.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the installation ensures that the pre-installation environment is restored in the event of an unsuccessful installation.</li> </ul>
<ul style="list-style-type: none"> <li>• The installation ensures that the software is configured and customised according to the installation specifications.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the installation ensures that the software is configured and customised according to installation specifications.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Projects</li> <li>• Practical exercises</li> <li>• Demonstrations</li> </ul>	



<b>SUBJECT OUTCOME</b>	
<b>5.3 Test installation of system software and application software for a single-user personal computer.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The test verifies that the software functions according to the publisher's specification.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the test verifies that the software functions according to the publisher's specification.</li> </ul>
<ul style="list-style-type: none"> <li>• The test procedure meets the publisher's guidelines.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the test procedure meets the publisher's guidelines.</li> </ul>
<ul style="list-style-type: none"> <li>• The test verifies that the software functions in the specified environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the test verifies that the software functions in a specified environment.</li> </ul>
<ul style="list-style-type: none"> <li>• The test verifies that the system software communicates with hardware, peripherals and other application software according to the installation specification.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the test verifies that the system software communicates with hardware, peripherals and other application software according to the installation specification.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Projects</li> <li>• Case Studies</li> <li>• Practical exercises</li> <li>• Demonstration</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>5.4 Accomplish user acceptance sign-off for the installation system software and application software.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The user acceptable sign-off outlines the publisher's operating procedures and allows the user to begin operating the system.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the user acceptable sign-off outlines the publisher's operating procedures to allow the user to begin operating the system.</li> </ul>
<ul style="list-style-type: none"> <li>• The user acceptable sign-off provides training and support options to the user.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the user acceptable sign-off provides training and support options to the user.</li> </ul>
<ul style="list-style-type: none"> <li>• The user acceptable sign-off reviews the installation and allows the user to determine whether the installation has been complete.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the user acceptable sign-off reviews the installation to allow the user to determine whether the installation has been complete.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Practical exercises</li> <li>• Demonstrations</li> <li>• Role-play</li> <li>• Interviews</li> </ul>	

**Topic 6: Installation of PC or handheld computer peripherals**

<b>SUBJECT OUTCOME</b>	
<b>6.1 Plan the installation of a single-user personal computer and peripherals.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The plan identifies and explains the feasibility of the specification.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the plan identifies the feasibility of the specification.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan identifies the time and resources required for the installation.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the plan identifies the time and resources required for the installation.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan adopts a review procedure which ensures that the final outcome meets user requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the plan adopts a review procedure to ensure that the final outcome meets the user requirements.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Case Studies</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>6.2 Install a single-user computer and peripherals.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The installation ensures that the hardware units match the installation specification.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the installation ensures that the hardware units match the installation specification.</li> </ul>
<ul style="list-style-type: none"> <li>• The installation ensures that the hardware units are located in accordance with the installation and the manufacturer's specifications.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the installation ensures that the hardware units are located in accordance with the installation and the manufacturer's specifications.</li> </ul>
<ul style="list-style-type: none"> <li>• The installation ensures that the hardware units are interconnected according to the installation and the manufacturer's specifications.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the installation ensures that the hardware units are interconnected according to the installation and manufacturer's specifications.</li> </ul>
<ul style="list-style-type: none"> <li>• The installation ensures that the hardware units complete the manufacturer's diagnostic tests free of errors.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the installation ensures that the hardware units complete the manufacturer's diagnostic tests free of errors.</li> </ul>
<ul style="list-style-type: none"> <li>• The installation ensures that the system software is configured and customized according to the installation and the manufacturer's specifications.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the installation ensures that the system software is configured and customized according to the installation and the manufacturer's specifications.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Practical exercises</li> <li>• Demonstrations</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>6.3 Test the installation of a single-user computer and peripherals.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The test ensures that the computer system operates according to the manufacturers and installation specifications.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the test ensures that the computer system operates according to the manufacturers and installation specifications.</li> </ul>
<ul style="list-style-type: none"> <li>• The testing procedure meets the manufacturer's guidelines.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the testing procedure meets the manufacturer's guidelines.</li> </ul>
<ul style="list-style-type: none"> <li>• The test results are recorded according to organization specifications.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the test results are recorded according to the organizations specifications.</li> </ul>
<ul style="list-style-type: none"> <li>• The test ensures that the system software and application software communicate with the hardware according to manufacturer's specifications.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how the test ensures that the system software and application software communicate with the hardware according to the manufacturer's specifications.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Practical exercises</li> <li>• Demonstrations</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>6.4 Gain user acceptance for the installation of a single-user computer and peripherals.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• An explanation of the manufacturer supplied operating procedures allows the user to begin operating the system.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the manufacturer's supplied operating procedures allow the users to begin operating the system.</li> </ul>
<ul style="list-style-type: none"> <li>• An explanation of training and support options allows the user to obtain training and support.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how through the use of training and support options users can obtain training and support.</li> </ul>
<ul style="list-style-type: none"> <li>• A review of the installation and installation specification allows the user to judge that the installation has been completed.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the review of the installation and installation specification allow the user to judge that the installation has been completed.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Practical exercises</li> <li>• Demonstrations</li> <li>• Role-play</li> <li>• Interviews</li> </ul>	

**Topic 7 Test IT systems against given specifications**

<b>SUBJECT OUTCOME</b>	
<b>7.1. Select an appropriate test procedure for the IT Systems to be tested.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The selection clarifies the purpose of the test and the data required from it.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate and explain how the selection clarifies the purpose of the test and the data required from it.</li> </ul>
<ul style="list-style-type: none"> <li>• The selection identifies any factors that may affect the choice of the tests procedure.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the selection identifies any factors that may affect the choice of the tests procedure.</li> </ul>
<ul style="list-style-type: none"> <li>• The selection identifies the resources available for the test procedure.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the selection identifies the resources available for the test procedure.</li> </ul>
<ul style="list-style-type: none"> <li>• The selection complies with all relevant regulatory, licensing, contractual and health and safety requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the selection complies with all relevant regulatory, licensing, contractual and health and safety requirements.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Projects</li> <li>• Investigations/Research</li> <li>• Case Studies</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>7.2 Apply the test procedure to the IT Systems to be tested.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The application ensures correct preparation of the test procedure.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the application ensures the correct preparation of the test procedure.</li> </ul>
<ul style="list-style-type: none"> <li>• The application tests the hardware using the selected test procedure.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the application tests the hardware using the selected test procedure.</li> </ul>
<ul style="list-style-type: none"> <li>• The application tests the software using the selected test procedure.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the application tests the software using the selected test procedure.</li> </ul>
<ul style="list-style-type: none"> <li>• The application ensures that all performance parameters and operational requirements are tested.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the application ensures that all performance parameters and operational requirements are tested.</li> </ul>
<ul style="list-style-type: none"> <li>• The application identifies any problems with the test procedure and takes appropriate action.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the application identifies any problems with the test procedure and takes appropriate action.</li> </ul>
<ul style="list-style-type: none"> <li>• The application complies with all relevant regulatory, licensing, contractual and health and safety requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the application complies with all relevant regulatory, licensing, contractual and health and safety requirements.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Practical exercises</li> <li>• Demonstrations</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>7.3. Collect and record data from tests.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The recording ensures that the required data was produced.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the recording ensures that the required data is produced.</li> </ul>
<ul style="list-style-type: none"> <li>• The recording ensures that the data was correctly collected.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the recording ensures that the data was correctly collected.</li> </ul>
<ul style="list-style-type: none"> <li>• The recording ensures that the data are sufficient to meet the purpose of the test.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the recording ensures that the data are sufficient to meet the purpose of the test.</li> </ul>
<ul style="list-style-type: none"> <li>• The recording identifies any problems with the collection of data and takes appropriate action.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the recording identifies any problems with the collection of data and takes appropriate action.</li> </ul>
<ul style="list-style-type: none"> <li>• The results are recorded using an appropriate information system.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the results are recorded using an appropriate information system.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Projects</li> <li>• Practical exercises</li> <li>• Role-play</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>7.4. Prepare the testing to ensure the given specifications will be addressed.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The preparation ensures a plan is prepared for the testing in line with the given specifications.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the preparation ensures that a plan is prepared for the testing in line with the given specifications.</li> </ul>
<ul style="list-style-type: none"> <li>• The preparation ensures the plan specifies what needs to be tested.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the preparation ensures that the plan specifies what needs to be tested.</li> </ul>
<ul style="list-style-type: none"> <li>• The preparation documents the test scenarios and test data to be used for the test.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the preparation documents the test scenarios and test data to be used for the test.</li> </ul>
<ul style="list-style-type: none"> <li>• The preparation documents the outcomes expected for each of the scenarios prepared.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the preparation documents the outcomes expected for each of the scenarios prepared.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Practical exercises</li> <li>• Demonstrations</li> </ul>	

### Topic 8 Preventative maintenance, environment and safety issues in a computer environment

<b>SUBJECT OUTCOME</b>	
<b>8.1. Demonstrate an understanding of the use of preventative maintenance measures and procedures.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The demonstration identifies the causes of computer hardware maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify the causes of computer hardware maintenance.</li> </ul>
<ul style="list-style-type: none"> <li>• The demonstration covers preventive measures for the causes of computer hardware maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate preventive measures for the causes of computer hardware maintenance.</li> </ul>

<b>ASSESSMENT TASKS OR ACTIVITIES</b>
<ul style="list-style-type: none"> <li>• Assignments/tasks</li> <li>• Projects</li> <li>• Investigations /research</li> <li>• Practical exercises</li> <li>• Demonstrations</li> </ul>

<b>SUBJECT OUTCOME</b>	
<b>8.2. Demonstrate an understanding of the use of safety measures and procedures.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The demonstration explains safety measures for different types of fires and which applies to computer environments.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate safety measures for different types of fires and those that apply to computer environments.</li> </ul>
<ul style="list-style-type: none"> <li>• The demonstration covers potential hazards and safety procedures relating to the computer environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate potential hazards and safety procedures relating to the computer environment.</li> </ul>
<ul style="list-style-type: none"> <li>• The demonstration covers Electrostatic Discharge (ESD) and precautions for it.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate Electrostatic Discharge (ESD) and the precautions that can be taken for it.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Practical exercises</li> <li>• Demonstrations</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>8.3. Explain environmental protection measures and procedures of a computer working environment.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The explanation covers handling of computer components.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how to handle computer components.</li> </ul>
<ul style="list-style-type: none"> <li>• The explanation covers handling of computer peripheral components.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how to handle computer peripheral components.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> </ul>	

### Topic 9: Technical computer problems

<b>SUBJECT OUTCOME</b>	
<b>9.1 Troubleshoot technical computer problems, identifying possible course of action.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The troubleshooting verifies the reported symptoms and identifies any further symptoms.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how troubleshooting verifies the reported symptoms and identifies any further symptoms.</li> </ul>
<ul style="list-style-type: none"> <li>• The troubleshooting uses information sources to identify known problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how troubleshooting uses information sources to identify known problems.</li> </ul>
<ul style="list-style-type: none"> <li>• The troubleshooting use industry recommended procedures to identify the cause of the problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how troubleshooting uses industry recommended procedures to identify the cause of the problem.</li> </ul>
<ul style="list-style-type: none"> <li>• The troubleshooting results in undiagnosed problems to be forwarded to technical expert support staff for assistance.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how troubleshooting results in undiagnosed problems been forwarded to technical expert support staff for assistance.</li> </ul>

<b>ASSESSMENT TASKS OR ACTIVITIES</b>
<ul style="list-style-type: none"> <li>• Assignments/tasks</li> <li>• Projects</li> <li>• Investigations/research</li> <li>• Practical exercises</li> </ul>

<b>SUBJECT OUTCOME</b>	
<b>9.2. Provide solutions to technical computer problems, including time estimates, cost and resources.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The provision estimates the costs and benefits of the solution to allow a judgement to be made about implementing the solution.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how provision estimates the costs and benefits of the solution to allow a judgement to be made about implementing the solution.</li> </ul>
<ul style="list-style-type: none"> <li>• The provision describes the solution so that a judgement can be made about its feasibility and effectiveness.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe a solution that a judgement can be made about its feasibility and effectiveness.</li> </ul>
<ul style="list-style-type: none"> <li>• The provision ensures that a plan for implementing the solution estimates the time and resources required, and specified milestones.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the provision ensures that a plan for implementing the solution estimates the time and resources required and specified milestones.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/tasks</li> <li>• Projects</li> <li>• Investigations/research</li> <li>• Practical exercises</li> <li>• Demonstrations</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>9.3 Maintain information logs of problems identified.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The information logs are maintained in a recording system for problems and solutions.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the information logs are maintained in a recording system for problems and solutions.</li> </ul>
<ul style="list-style-type: none"> <li>• The information log maintenance identifies sources for occurrence volumes for problems and solution for future reference of technical support for the area of expertise.</li> </ul>	<ul style="list-style-type: none"> <li>• Outline and explain how the information log maintenance identifies sources for occurrence volumes for problems and solution for future reference of technical support in the area of expertise.</li> </ul>
<ul style="list-style-type: none"> <li>• The information log maintenance identifies sources for new information and trends for future reference of technical support in the area of expertise.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the information log identifies sources for new information and trends for future reference of technical support in the area of expertise.</li> </ul>
<ul style="list-style-type: none"> <li>• The information logs maintained show an understanding of the need for information logs as sources of information for future reference of technical support for the area of expertise.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the information logs maintained show an understanding of the need for information logs as sources of information for future reference of technical support for the area of expertise.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Projects</li> <li>• Practical exercises</li> <li>• Demonstrations</li> <li>• Role-play</li> </ul>	

**Topic 10: Resolve computer user's problems**

<b>SUBJECT OUTCOME</b>	
<b>10.1 Receive computer user's problems.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The request received identifies the users and their terms of support so that the response procedure can be determined.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the request received identifies the users and their terms of support so that the response procedure can be determined.</li> </ul>
<ul style="list-style-type: none"> <li>• The request received records sufficient information about the problem to begin an investigation.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the request received records sufficient information about the problem to begin an investigation.</li> </ul>
<ul style="list-style-type: none"> <li>• The contact with users of the request received employs a personal communication technique which allows users to feel that the problem will be resolved to their satisfaction.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the contact with the users of the request received must employ a personal communication technique which allows users to feel that the problem will be resolved to their satisfaction.</li> </ul>
<ul style="list-style-type: none"> <li>• The request received is assigned a timeframe and priority to the problem according to organisation standards and the terms of the support agreement for each user.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the request received is assigned a timeframe and priority to the problem according to the organisation standards and the terms of the support agreement for each user.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/tasks</li> <li>• Projects</li> <li>• Investigations/research</li> <li>• Practical exercises</li> <li>• Role-play</li> <li>• Interviews</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>10.2. Investigate computer user's problems.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The investigation uses information sources to identify known problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the investigation uses information sources to identify known problems.</li> </ul>
<ul style="list-style-type: none"> <li>• The investigation use industry recommended procedures to identify the cause of the problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the investigation uses industry recommended procedures to identify the cause of the problem.</li> </ul>
<ul style="list-style-type: none"> <li>• The investigation records symptoms of unresolved identified problems to technical support services to resolve.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the investigation records symptoms of unresolved identified problems to technical support services to resolve.</li> </ul>
<ul style="list-style-type: none"> <li>• The investigation advises third parties of progress according to the terms of the user's support agreement.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the investigation advises third parties of the progress according to the terms of the user's support agreement.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/TASKS</li> <li>• Projects</li> <li>• Investigations/RESEARCH</li> <li>• Practical exercises</li> <li>• Role-play</li> </ul>	



<b>SUBJECT OUTCOME</b>	
<b>10.3. Implement solutions to computer user's problems.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>The implementation ensures that the user's system is returned as soon as possible.</li> </ul>	<ul style="list-style-type: none"> <li>Explain how the implementation ensures that the user's system is returned as soon as possible.</li> </ul>
<ul style="list-style-type: none"> <li>The implementation records the action taken in sufficient detail to allow it to be repeated.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how the implementation uses reference data sources to identify known solutions to known problems.</li> </ul>
<ul style="list-style-type: none"> <li>The implementation uses reference data sources to identify known solutions to known problems.</li> </ul>	<ul style="list-style-type: none"> <li>Explain how the implementation designs solutions for any new problems identified.</li> </ul>
<ul style="list-style-type: none"> <li>The implementation designs solutions for any new problems identified.</li> </ul>	<ul style="list-style-type: none"> <li>Explain how the implementation records the action taken in sufficient detail to allow it to be repeated.</li> </ul>
<ul style="list-style-type: none"> <li>The implementation monitors progress of a solution so that users may be advised of progress according to the terms of their support agreement.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how the implementation monitors progress of a solution so that users may be advised of progress according to the terms of their support agreement.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>Assignments/tasks</li> <li>Projects</li> <li>Practical exercises</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>10.4. Close resolved computer user's problems.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>The closure presents a report on the resolution of each problem to the user, so that they may judge that the problem has been satisfactorily resolved.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how the closure presents a report on the resolution of each problem to the user, so that they may judge that the problem has been satisfactorily resolved.</li> </ul>
<ul style="list-style-type: none"> <li>The closure records resolution of the problem according to organisation standards and procedures.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how the closure records the resolution of the problem according to organisation standards and procedures.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>Assignments/tasks</li> <li>Projects</li> <li>Practical exercises</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>10.5. Forward unresolved computer user's problems to appropriate area</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>The extension of the problem is reported to the user involved, according to the terms of their support agreement.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how the extension of the problem is reported to the user involved, according to the terms of their support agreement.</li> </ul>
<ul style="list-style-type: none"> <li>The extension advises third parties of progress according to the terms of the user's support agreement.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how the extension advises third parties of progress according to the terms of the user's support agreement.</li> </ul>
<ul style="list-style-type: none"> <li>The extension records additional information on unresolved identified problems to be forwarded to appropriate area to resolve.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how the extension records additional information on unresolved identified problems to be forwarded to appropriate area to resolve.</li> </ul>

<b>ASSESSMENT TASKS OR ACTIVITIES</b>
<ul style="list-style-type: none"> <li>• Assignments/Tasks</li> <li>• Projects</li> <li>• Practical exercises</li> <li>• Role-play</li> </ul>

### Topic 11: Problem solving strategies

<b>SUBJECT OUTCOME</b>	
<b>11.1. Define and analyse the problem.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The definition ensures that the problem is examined and identified in terms of problem type, problem parameters, and possible causes.</li> </ul>	<ul style="list-style-type: none"> <li>• Examine, identify and define problem in terms of problem type, problem parameters, and possible causes.</li> </ul>
<ul style="list-style-type: none"> <li>• The definition ensures that facts are collected to meet the problem requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and ensure that the facts collected meet the problem requirements.</li> </ul>
<ul style="list-style-type: none"> <li>• The analysis ensures that problem components are identified to determine possible courses of action.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify problem components to determine possible courses of action.</li> </ul>
<ul style="list-style-type: none"> <li>• The analysis ensures that the problem is analysed for cross-cultural implications.</li> </ul>	<ul style="list-style-type: none"> <li>• Analyse the problem for cross-cultural implications.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Investigations/research</li> <li>• Practical exercises</li> <li>• Projects</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>11.2. Evaluate solutions.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The evaluation identifies possible solutions to the problem by using a range of problem solving techniques.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify possible solutions to the problem using a range of problem solving techniques.</li> </ul>
<ul style="list-style-type: none"> <li>• The evaluation establishes criteria for evaluating solutions to match the type of problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify criteria for evaluating solutions to match the type of problem.</li> </ul>
<ul style="list-style-type: none"> <li>• Possible solutions are evaluated against established criteria.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate possible solutions against established criteria.</li> </ul>
<ul style="list-style-type: none"> <li>• The evaluation ensures that the solutions are selected to meet established criteria and problem requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate that the solutions selected meet established criteria and problem requirements.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/tasks</li> <li>• Projects</li> <li>• Case studies</li> <li>• Practical exercises</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>11.3. Implement the solution.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>The implementation ensures that solutions are trailed and/or monitored for effectiveness of problem solution.</li> </ul>	<ul style="list-style-type: none"> <li>Explain how to ensure that solutions are trailed and/or monitored for effectiveness of problem solution.</li> </ul>
<ul style="list-style-type: none"> <li>The implementation ensures that the solutions are reviewed and modified, and practices are standardised where required.</li> </ul>	<ul style="list-style-type: none"> <li>Explain how to ensure that the solutions implemented are reviewed and modified, and practices are standardised where required.</li> </ul>
<ul style="list-style-type: none"> <li>The implementation ensures that stakeholders are consulted during implementation.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that stakeholders are consulted during implementation.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>Assignments/tasks</li> <li>Projects</li> <li>Practical exercises</li> </ul>	

### Topic 12: Repair a PC or handheld computer and peripherals to module level

<b>SUBJECT OUTCOME</b>	
<b>12.1. Diagnose faults with a personal computer.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>The diagnosis of each fault verifies the reported symptoms, and identifies any further symptoms.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how diagnosis of each fault verifies the reported symptoms, and identifies any further symptoms.</li> </ul>
<ul style="list-style-type: none"> <li>The diagnosis identifies the causes of the symptoms, using diagnostic procedures recommended by industry, and according to the user's requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how diagnosis identifies the causes of the symptoms, using diagnostic procedures recommended by industry, and according to the user's requirements.</li> </ul>
<ul style="list-style-type: none"> <li>The diagnosis identifies known problems using information sources.</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate how diagnosis identifies known problems using information sources.</li> </ul>
<ul style="list-style-type: none"> <li>The diagnosis identifies hardware faults to module level, and software faults to packaged software level.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate and explain how diagnosis identifies hardware faults to module level, and software faults to packaged software level.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>Assignments/tasks</li> <li>Projects</li> <li>Investigations/research</li> <li>Practical exercises</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>12.2. Plan the repair of a personal computer to module level.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The plan reviews the diagnosis and explains feasibility of the repair.</li> </ul>	<ul style="list-style-type: none"> <li>• Outline how the plan reviews the diagnosis and how it explains the feasibility of the repair.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan outlines the strategy for repairing the fault.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the plan outlines the strategy for repairing the fault.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan adopts a review procedure which ensures that the final outcome meets user requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Briefly explain (step by step) how the plan adopts a review procedure which ensures that the final outcome meets user requirements.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan estimates the effort, duration and resources required for the repair.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the plan estimates the effort, duration and resources required for the repair.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan ensures that the resources required to complete the repair are available at the repair site.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the plan ensures that the resources required to complete the repair are available at the repair site.</li> </ul>
<ul style="list-style-type: none"> <li>• The plan ensures that the replacement modules and software are compatible with the computer system, and carry evidence of integrity.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the plan ensures that the replacement modules and software are compatible with the computer system, and carry evidence of integrity.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/tasks</li> <li>• Projects</li> <li>• Investigations/research</li> <li>• Practical exercises</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>12.3. Replace faulty modules in a personal computer.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The replacement modules are installed according to manufacturer's specifications.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the replacement modules are installed according to manufacturer's specifications.</li> </ul>
<ul style="list-style-type: none"> <li>• The replacement ensures that modules function according to manufacturer's specification, by carrying out appropriate tests.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the replacement ensures that modules function according to manufacturer's specification, by carrying out appropriate tests.</li> </ul>
<ul style="list-style-type: none"> <li>• The replacement ensures that the personal computer operates according to hardware and software manufacturers' specification.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the replacement ensures that the personal computer operates according to hardware and software manufacturer's specification.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/tasks</li> <li>• Projects</li> <li>• Practical exercises</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>12.4. Resolve faulty software in a personal computer.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The resolution ensures that the personal computer software problem is resolved by following the publisher's instructions.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the resolution ensures that the personal computer software problem is resolved by following the publisher's instructions.</li> </ul>
<ul style="list-style-type: none"> <li>• The resolution ensures that the personal computer hardware and software operates according to the publisher's specification.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the resolution ensures that the personal computer hardware and software operates according to the publisher's specification.</li> </ul>
<ul style="list-style-type: none"> <li>• The resolution minimises disruption to the user.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how the resolution minimises disruption to the user.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/tasks</li> <li>• Projects</li> <li>• Investigations/research</li> <li>• Practical exercise</li> </ul>	

<b>SUBJECT OUTCOME</b>	
<b>12.5. Restore a personal computer to service.</b>	
<b>ASSESSMENT STANDARD</b>	<b>LEARNING OUTCOME</b>
<ul style="list-style-type: none"> <li>• The restoration ensures that the personal computer user's data and configuration are restored according to repair plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the restoration ensures that the personal computer user's data and configuration are restored according to the repair plan.</li> </ul>
<ul style="list-style-type: none"> <li>• The restoration ensures that the personal computer is available to the user.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain and demonstrate how the restoration ensures that the personal computer is available to the user.</li> </ul>
<b>ASSESSMENT TASKS OR ACTIVITIES</b>	
<ul style="list-style-type: none"> <li>• Assignments/tasks</li> <li>• Projects</li> <li>• Practical exercises</li> <li>• Role-play</li> <li>• Interviews</li> </ul>	

## 4 SPECIFICATIONS FOR EXTERNAL ASSESSMENT IN COMPUTER HARDWARE AND SOFTWARE - LEVEL 3

### 4.1 Integrated summative assessment task (ISAT)

A compulsory component of the external assessment (ESASS) is the **integrated summative assessment task (ISAT)**. The integrated summative assessment task (ISAT) draws on the students' cumulative learning achieved throughout the year. The task requires **integrated application of competence** and is executed and recorded in compliance with assessment conditions.

Two approaches to the integrated summative assessment task (ISAT) may be as follows:

- The students are assigned a task at the beginning of the year which they will have to complete in phases throughout the year to obtain an assessment mark. A final assessment is made at the end of the year when the task is completed.

**OR**

- Students achieve the competencies throughout the year but the competencies are assessed cumulatively in a single assessment or examination session at the end of the year.

The integrated summative assessment task (ISAT) is set by an externally appointed examiner and is conveyed to colleges in the first quarter of the year.

The integrated assessment approach enables students to be assessed in more than one subject with the same integrated summative assessment task (ISAT).

### 4.2 National Examination

A national examination is conducted annually in October or November by means of a paper(s) set and moderated externally. The following distribution of cognitive application is suggested:

LEVEL 3	<b>KNOWLEDGE AND COMPREHENSION</b>	<b>APPLICATION</b>	<b>ANALYSIS, SYNTHESIS AND EVALUATION</b>
	40%	40%	20%