



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATES (VOCATIONAL)

ASSESSMENT GUIDELINES

DATA COMMUNICATION AND NETWORKING NQF Level 4

September 2007

DATA COMMUNICATION AND NETWORKING – LEVEL 4

CONTENTS

SECTION A: PURPOSE OF THE SUBJECT ASSESSMENT GUIDELINES

SECTION B: ASSESSMENT IN THE NATIONAL CERTIFICATES (VOCATIONAL)

- 1 Assessment in the National Certificates (Vocational)**
- 2 Assessment framework for vocational qualifications**
 - 2.1 Internal continuous assessment (ICASS)
 - 2.2 External summative assessment (ESASS)
- 3 Moderation of assessment**
 - 3.1 Internal moderation
 - 3.2 External moderation
- 4 Period of validity of internal continuous assessment (ICASS)**
- 5 Assessor requirements**
- 6 Types of assessment**
 - 6.1 Baseline assessment
 - 6.2 Diagnostic assessment
 - 6.3 Formative assessment
 - 6.4 Summative assessment
- 7 Planning assessment**
 - 7.1 Collecting evidence
 - 7.2 Recording
 - 7.3 Reporting
- 8 Methods of assessment**
- 9 Instruments and tools for collecting evidence**
- 10 Tools for assessing student performance**
- 11 Selecting and/or designing recording and reporting systems**
- 12 Competence descriptions**
- 13 Strategies for collecting evidence**
 - 13.1 Record sheets
 - 13.2 Checklists

SECTION C: ASSESSMENT IN DATA COMMUNICATION AND NETWORKING

- 1 Schedule of assessment**
- 2 Recording and reporting**
- 3 Internal assessment of Subject Outcomes in Data Communication and Networking - Level 4**
- 4 Specifications for external assessment in Data Communication and Networking - Level 4**
 - 4.1 Integrated summative assessment task (ISAT)
 - 4.2 National Examination

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 Data Communication and Networking 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: Data Communications and Networking* to prepare for and deliver Data Communications and Networking. 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 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 be customised for students who experience barriers to learning, 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.

LECTURER ASSESSMENT	The lecturer assesses students' performance against given criteria in different contexts, such as individual work, group work, etc.
SELF-ASSESSMENT	Students assess their own performance against given criteria in different contexts, such as individual work, group work, etc.
PEER ASSESSMENT	Students assess another student's or group of students' performance against given criteria in different contexts, such as individual work, group work, etc.
GROUP ASSESSMENT	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)
Assessment instruments	<ul style="list-style-type: none"> • Observation • Class questions • Lecturer, student, parent discussions 	<ul style="list-style-type: none"> • Assignments or tasks • Projects • Investigations or research • Case studies • Practical exercises • Demonstrations • Role-play • Interviews 	<ul style="list-style-type: none"> • Examinations • Class tests • Practical examinations • Oral tests • Open-book tests
Assessment tools	<ul style="list-style-type: none"> • Observation sheets • Lecturer's notes • Comments 	<ul style="list-style-type: none"> • Checklists • Rating scales • Rubrics 	<ul style="list-style-type: none"> • Marks (e.g. %) • Rating scales (1-7)
Evidence	<ul style="list-style-type: none"> • Focus on individual students • Subjective evidence based on lecturer observations and impressions 	<p>Open middle: Students produce the same evidence but in different ways.</p> <p>Open end: 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 DATA COMMUNICATION AND NETWORKING

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 Data Communication and Networking 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

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 Data Communication and Networking:

NO. OF UNITS	ASSESSMENT	COVERAGE
2	Formal written tests	1 or more completed topics
1	Internal written exam	All completed topics
3	Practical assessments	Must cover the related subject outcomes <ul style="list-style-type: none">• Install a LAN• Install networked computer application software• Support a LAN user/s• Support Local Area computer Network

**ASSESSMENT OF
DATA COMMUNICATION AND NETWORKING
LEVEL 4**

3 INTERNAL ASSESSMENT OF SUBJECT OUTCOMES IN DATA COMMUNICATION AND NETWORKING - LEVEL 4

Topic 1 Principles of computer network

SUBJECT OUTCOME	
1.1 Describe data communication.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> The roles of key elements in data communication are explained. 	<ul style="list-style-type: none"> Explain the roles of key elements in data communication.
<ul style="list-style-type: none"> The difference between LANs and WANs is explained. 	<ul style="list-style-type: none"> Explain the difference between local area and wide area networks (LANs and WANs).
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Observations. Class tests. Demonstrations. Practical tests. Interviews. Assignment. Projects. 	

SUBJECT OUTCOME	
1.2 Demonstrate the knowledge of main features of Local Area Networks (LANs).	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> The uses of LANs is identified with respect to current practice. 	<ul style="list-style-type: none"> Identify the uses of LANs with respect to current practice.
<ul style="list-style-type: none"> The main types of LAN media are identified. 	<ul style="list-style-type: none"> Identify the main types of LAN media.
<ul style="list-style-type: none"> The main LAN configurations are described. 	<ul style="list-style-type: none"> Describe the main LAN configurations.
<ul style="list-style-type: none"> LAN bandwidth s described. 	<ul style="list-style-type: none"> Describe LAN bandwidth.
<ul style="list-style-type: none"> LAN protocols are described. 	<ul style="list-style-type: none"> Describe LAN protocols.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Observations. Class tests. Demonstrations. Practical tests. Interviews. Assignment. Projects. 	

SUBJECT OUTCOME	
1.3 Demonstrate knowledge of main features of WANs	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> The uses of WANs s explained with respect to current practice. 	<ul style="list-style-type: none"> Explain the uses of WANs with respect of current practice.
<ul style="list-style-type: none"> The uses, hardware requirements and advantages of WANs are described. 	<ul style="list-style-type: none"> Explain the uses, hardware requirements and advantages of WANs.

ASSESSMENT TASKS OR ACTIVITIES
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment. • Projects.

Topic 2: Synchronous/asynchronous communication of computers

SUBJECT OUTCOME	
2.1 Describe past, present and emerging developments in data communication.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The origin of current data communication is explained. 	<ul style="list-style-type: none"> • Explain the origin of current data communication.
<ul style="list-style-type: none"> • The taxonomy of current systems is described. 	<ul style="list-style-type: none"> • Describe taxonomy of current systems.
<ul style="list-style-type: none"> • Trends from emerging developments in data communications are identified. 	<ul style="list-style-type: none"> • Identify trends from emerging developments in data communications.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment. 	

SUBJECT OUTCOME	
2.2 Describe synchronous and asynchronous data communication.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The characteristics of each form of data communication are outlined. 	<ul style="list-style-type: none"> • Outline the characteristics of each form of data communication.
<ul style="list-style-type: none"> • The features of data communications equipment is explained with respect to synchronous and asynchronous data communication. 	<ul style="list-style-type: none"> • Explain the features of data communications equipment with respect to synchronous and asynchronous data communication.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment. 	

SUBJECT OUTCOME	
2.3 Describe communication with computers using telephone networks.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> Types of telephone network services are distinguished, and their features and costs outlined. 	<ul style="list-style-type: none"> Distinguish types of telephone network services and outline their features and costs.
<ul style="list-style-type: none"> The functions of telephone network components are outlined. 	<ul style="list-style-type: none"> Outline the functions of telephone network components.
<ul style="list-style-type: none"> The types of problems encountered in digital transmission are explained. 	<ul style="list-style-type: none"> Explain the types of problems encountered in digital transmission.
<ul style="list-style-type: none"> The options available as distance increases are described. 	<ul style="list-style-type: none"> Describe the options available as distance increases.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Class tests. Demonstrations. Practical tests. Interviews. Assignment. 	

SUBJECT OUTCOME	
2.4 Describe synchronous and asynchronous communication with computers.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> The interface of the physical layer for synchronous and asynchronous communication is described. 	<ul style="list-style-type: none"> Describe the interface of the physical layer for synchronous and asynchronous communication.
<ul style="list-style-type: none"> The application and operation of protocols are described. 	<ul style="list-style-type: none"> Describe the application and operation of protocols.
<ul style="list-style-type: none"> The delays incurred in transmissions are described. 	<ul style="list-style-type: none"> Describe the delays incurred in transmissions.
<ul style="list-style-type: none"> The operation of link control protocols is described. 	<ul style="list-style-type: none"> Describe the operation of link control protocols.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Class tests. Demonstrations. Practical tests. Interviews. Assignment. 	

Topic 3: Computer network architectures and standards

SUBJECT OUTCOME	
3.1 Describe computer network types and standards.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> Types of networks are distinguished. 	<ul style="list-style-type: none"> Distinguish types of networks.
<ul style="list-style-type: none"> Network topologies are compared. 	<ul style="list-style-type: none"> Compare network topologies.
<ul style="list-style-type: none"> Features of node addressing method are described and distinguished. 	<ul style="list-style-type: none"> Describe and distinguish features of node addressing methods.
<ul style="list-style-type: none"> The standards for industry network architectures are described. 	<ul style="list-style-type: none"> Describe the standards for industry network architectures.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Demonstrations. Practical tests. 	

SUBJECT OUTCOME	
3.2 Explain local and wide area network architectures.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> Channel utilisation techniques and their features are described. 	<ul style="list-style-type: none"> Describe channel utilisation techniques and their features.
<ul style="list-style-type: none"> The principles of access protocols are compared. 	<ul style="list-style-type: none"> Compare the principles of access protocols.
<ul style="list-style-type: none"> The purpose of LAN components is identified. 	<ul style="list-style-type: none"> Identify the purpose of LAN components.
<ul style="list-style-type: none"> Network configurations and installation issues are described. 	<ul style="list-style-type: none"> Describe network configurations and installation issues.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Class tests. Assignment. 	

SUBJECT OUTCOME	
3.3 Explain WAN architectures.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> Switching techniques are identified. 	<ul style="list-style-type: none"> Identify switching techniques.
<ul style="list-style-type: none"> Switching techniques are compared. 	<ul style="list-style-type: none"> Compare switching techniques.
<ul style="list-style-type: none"> WAN management issues are described. 	<ul style="list-style-type: none"> Describe WAN management issues.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Class tests. Assignment. 	

Topic 4: Computer network communication

SUBJECT OUTCOME	
4.1 Explain computer network transmission security and integrity problems and solutions.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> Current problems are described. 	<ul style="list-style-type: none"> Describe current problems.
<ul style="list-style-type: none"> The requirements to address the problems are identified. 	<ul style="list-style-type: none"> Identify the requirements to address the problems.
<ul style="list-style-type: none"> The strategies to address the problems are explained and examples used in the industry provided. 	<ul style="list-style-type: none"> Explain the strategies to address the problems and provide examples used in the industry.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Observations. Class tests. Demonstrations. Practical tests. Interviews. Assignment. 	

SUBJECT OUTCOME	
4.2 Describe public switching computer network protocols.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The features of typical data link protocols are described. 	<ul style="list-style-type: none"> • Describe the features of typical data link protocols.
<ul style="list-style-type: none"> • The features of a data link protocol are described. 	<ul style="list-style-type: none"> • Describe the features of a data link protocol.
<ul style="list-style-type: none"> • The features of a network layer protocol are described. 	<ul style="list-style-type: none"> • Describe the features of a network layer protocol.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment. 	

SUBJECT OUTCOME	
4.3 Monitor a computer network.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • Monitoring is performed by using computer network monitoring tools. 	<ul style="list-style-type: none"> • Describe monitoring of computer network using computer network monitoring tools.
<ul style="list-style-type: none"> • Monitoring activities are described by means of a report. 	<ul style="list-style-type: none"> • Describe activities by means of a report.
<ul style="list-style-type: none"> • Common network problems are identified. 	<ul style="list-style-type: none"> • Identify common network problems.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment. 	

Topic 5: Computer cabling

SUBJECT OUTCOME	
5.1 Describe past, present and emerging developments in computer cabling.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The origin of current computer cabling systems is explained with an outline of past developments. 	<ul style="list-style-type: none"> • Explain the origin of current computer cabling systems with an outline of past developments.
<ul style="list-style-type: none"> • The taxonomy of current cabling systems is described. 	<ul style="list-style-type: none"> • Describe the taxonomy of current cabling systems.
<ul style="list-style-type: none"> • Trends from emerging developments in computer cabling are identified and projected. 	<ul style="list-style-type: none"> • Identify and project trends from emerging developments in computer cabling.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment. 	

SUBJECT OUTCOME	
5.2 Describe termination methods for computer cabling.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The characteristics of each method are described. 	<ul style="list-style-type: none"> • Describe the characteristics of each method.
<ul style="list-style-type: none"> • The features of each method are explained with respect to synchronous and asynchronous data communication. 	<ul style="list-style-type: none"> • Explain the features of each method with respect to synchronous and asynchronous data communication.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment. 	

Topic 6: Install a Local Area Network (LAN)

SUBJECT OUTCOME	
6.1 Review the design and installation plan of a local area computer network.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The feasibility of the network design and installation plan is identified and explained. 	<ul style="list-style-type: none"> • Identify and explain the feasibility of the network design and installation plan.
<ul style="list-style-type: none"> • The procedures to ensure that the final outcome meets user requirements are explained. 	<ul style="list-style-type: none"> • Explain the procedures to ensure that the final outcome meets user requirements.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment. 	

SUBJECT OUTCOME	
6.2 Install local area computer network devices.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The installation ensures that the device completes the manufacturer's diagnostic tests free of errors. 	<ul style="list-style-type: none"> • Explain how to ensure that the device completes the manufacturer's diagnostic tests free of errors.
<ul style="list-style-type: none"> • The installation ensures that the devices are located and interconnected according to the manufacturer's specifications and network design. 	<ul style="list-style-type: none"> • Explain how to ensure that the devices are located and interconnected according to the manufacturer's specifications and network design.
<ul style="list-style-type: none"> • The installation ensures that the devices are configured and customised according to the network design and the manufacturer's specifications. 	<ul style="list-style-type: none"> • Explain how to ensure that the devices are configured and customised according to the network design and the manufacturer's specifications.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment. 	

SUBJECT OUTCOME	
6.3 Install local area computer network system and application software.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • Installation ensures that the manufacturer's guidelines are followed. 	<ul style="list-style-type: none"> • Explain how to ensure that the manufacturer's guidelines are followed.
<ul style="list-style-type: none"> • Installation ensures that the software operates according to manufacturer's specification. 	<ul style="list-style-type: none"> • Explain how to ensure that the software operates according to manufacturer's specification.
<ul style="list-style-type: none"> • Installation ensures that software is configured and customised according to network designs. 	<ul style="list-style-type: none"> • Explain how to ensure that the software is configured and customised according to network designs.
<ul style="list-style-type: none"> • Installation ensures that the software performs according to the network design. 	<ul style="list-style-type: none"> • Explain how to ensure that the software performs according to the network design.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment. 	

SUBJECT OUTCOME	
6.4 Test the installation of a local area computer network.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • Testing ensures that the network operates according to manufacturer's and installation specifications. 	<ul style="list-style-type: none"> • Explain how testing will ensure that the network operates according to manufacturer's and installation specifications.
<ul style="list-style-type: none"> • Testing procedures meet the manufacturer's guidelines. 	<ul style="list-style-type: none"> • Explain how testing procedures meet the manufacturer's guidelines.
<ul style="list-style-type: none"> • Testing results are recorded according to the installation specifications. 	<ul style="list-style-type: none"> • Explain how to record testing results according to the installation specifications.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment. 	

SUBJECT OUTCOME	
6.5 Gain user acceptance for the installation of a local area computer network.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The manner in which the manufacturer's supplied operating procedures allow the user to begin operating the network is explained. 	<ul style="list-style-type: none"> • Explain how the manufacturer's supplied operating procedures will allow the user to begin operating the network.
<ul style="list-style-type: none"> • The manner in which training and support options allow the user to obtain training and support is explained. 	<ul style="list-style-type: none"> • Explain how training and support options allow the user to obtain training and support.
<ul style="list-style-type: none"> • The manner in which the installation and installation specifications allow the user to check that the installation has been completed is explained. 	<ul style="list-style-type: none"> • Explain how the installation and installation specifications allow the user to check that the installation has been completed.

ASSESSMENT TASKS OR ACTIVITIES
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignment.

Topic 7 Install networked computer application software

SUBJECT OUTCOME	
7.1. Plan the installation of networked computer application software.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The feasibility of the network application specification is identified and explained. 	<ul style="list-style-type: none"> • Identify and explain the feasibility of the network application specification.
<ul style="list-style-type: none"> • Milestones are specified and the time and resources required for the installation estimated. 	<ul style="list-style-type: none"> • Specify milestones and estimate the time and resources required for the installation.
<ul style="list-style-type: none"> • The manner in which to ensure that the installation is scheduled to minimise disruption to the users is explained. 	<ul style="list-style-type: none"> • Explain how to ensure that the installation is scheduled to minimise disruption to the users.
<ul style="list-style-type: none"> • The plan ensures that an analysis of risk identifies the tasks which are vulnerable to standard risks. 	<ul style="list-style-type: none"> • Explain how to ensure that a risk analysis identifies the tasks which are vulnerable to standard risks.
<ul style="list-style-type: none"> • The plan identifies measures to be taken to minimise risk, and the contingency measures to be adopted in the event of a risk manifesting. 	<ul style="list-style-type: none"> • Identify measures to be taken to minimise risk, and the contingency measures to be adopted in the event of a risk manifesting.
<ul style="list-style-type: none"> • The plan adopts a review procedure that ensures that the final outcome meets user requirements. 	<ul style="list-style-type: none"> • Explain how a review procedure will be adopted to ensure that the final outcome meets the user requirements.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignments. 	

SUBJECT OUTCOME	
7.2 Install networked computer application software.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The installation ensures that the software operates according to the publisher's specifications. 	<ul style="list-style-type: none"> • Explain how to ensure that the software operates according to the publisher's specifications.
<ul style="list-style-type: none"> • The installation ensures that the software is configured and customised according to the installation specification. 	<ul style="list-style-type: none"> • Explain how to ensure that the software is configured and customised according to the installation specification.
<ul style="list-style-type: none"> • The installation ensures that the software operates according to installation specification. 	<ul style="list-style-type: none"> • Explain how to ensure that the software operates according to installation specifications
<ul style="list-style-type: none"> • The pre-installation environment is restored in the event of an unsuccessful installation 	<ul style="list-style-type: none"> • Explain how to ensure that the pre-installation environment is restored in the event of an unsuccessful installation.

ASSESSMENT TASKS OR ACTIVITIES
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignments.

SUBJECT OUTCOME	
7.3. Test the installation of networked computer application software.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The test ensures that the software operates according to the manufacturer's and installation specification. 	<ul style="list-style-type: none"> • Explain how testing will ensure that the network operates according to manufacturer's and installation specifications.
<ul style="list-style-type: none"> • The test procedures meet the manufacturer's guidelines. 	<ul style="list-style-type: none"> • Explain how testing procedures meet the manufacturer's guidelines.
<ul style="list-style-type: none"> • Test results are recorded according to organisation specifications. 	<ul style="list-style-type: none"> • Explain how to record testing results according to the installation specifications.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignments. 	

SUBJECT OUTCOME	
7.4. Accomplish user acceptance for the installation of networked computer application software.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The manner in which the manufacturer's operating procedures allow the user to begin the network application is explained. 	<ul style="list-style-type: none"> • Explain how the manufacturer's supplied operating procedures will allow the user to begin the network application.
<ul style="list-style-type: none"> • The manner in which training and support options allow the user to obtain training and support is explained. 	<ul style="list-style-type: none"> • Explain how training and support options allow the user to obtain training and support.
<ul style="list-style-type: none"> • The manner in which installation and installation specifications allow the user to check whether the installation has been completed, is explained. 	<ul style="list-style-type: none"> • Explain how the installation and installation specifications allows the user to check that the installation has been completed.
<ul style="list-style-type: none"> • The manner in which to ensure that documentation is completed according to the publisher's and organisation requirements is explained. 	<ul style="list-style-type: none"> • Explain how to ensure that documentation is completed according to the publisher's and organisation requirements.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignments. 	

Topic 8 Principles of supporting LAN users

SUBJECT OUTCOME	
8.1. Demonstrate the use of LAN.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> The demonstration illustrates how user utilities are operated to perform user tasks according to the manufacturer's specifications. 	<ul style="list-style-type: none"> Demonstrate how user utilities are operated to perform user tasks according to the manufacturer's specifications.
<ul style="list-style-type: none"> The structure of the network access security system is described. 	<ul style="list-style-type: none"> Describe the structure of the network access security system.
<ul style="list-style-type: none"> The manner in which print queues are managed according to the manufacturer's specifications is explained and demonstrated. 	<ul style="list-style-type: none"> Explain and demonstrate how print queues are managed according to manufacturer's specifications.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Observations. Class tests. Demonstrations. Practical tests. Interviews. Assignments. 	

SUBJECT OUTCOME	
8.2. Install a single user computer application software package.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> The installation is performed according to manufacturer's specifications. 	<ul style="list-style-type: none"> Explain how to perform installation according to manufacturer's specifications.
<ul style="list-style-type: none"> The installation is configured according to specifications. 	<ul style="list-style-type: none"> Explain how to configure installations according to specifications.
<ul style="list-style-type: none"> Documentation is prepared according to industry recommended practice. 	<ul style="list-style-type: none"> Explain how to prepare documentation according to industry recommended practice.
<ul style="list-style-type: none"> The installation site is left clean and tidy according to industry recommended practice. 	<ul style="list-style-type: none"> Explain how to ensure that the installation site is left clean and tidy according to industry recommended practice.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Observations. Class tests. Demonstrations. Practical tests. Interviews. Assignments. 	

SUBJECT OUTCOME	
8.3. Customise a local area network user interface.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> The customisation includes preparation of a log in script. 	<ul style="list-style-type: none"> Explain how to prepare a log in script.
<ul style="list-style-type: none"> The customisation includes creation of a menu according to organisation's specifications. 	<ul style="list-style-type: none"> Explain how to create a menu according to organisation's specifications.
<ul style="list-style-type: none"> Documentation is completed according to industry recommended practice. 	<ul style="list-style-type: none"> Explain how to ensure that documentation is completed according to industry recommended practice.

ASSESSMENT TASKS OR ACTIVITIES
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignments.

SUBJECT OUTCOME	
8.4. Connect a LAN workstation.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The workstation is linked to a LAN according to manufacturer's specifications. 	<ul style="list-style-type: none"> • Explain how to ensure that the workstation is linked to a LAN according to manufacturer's specifications.
<ul style="list-style-type: none"> • The connection automates log in procedures in accordance with the manufacturer's specifications. 	<ul style="list-style-type: none"> • Explain how to ensure that connection automates log in procedures in accordance with the manufacturer's specifications.
<ul style="list-style-type: none"> • The connection resolves procedural problems encountered by users accessing the network. 	<ul style="list-style-type: none"> • Explain how to ensure that the connection resolves procedural problems encountered by users accessing the network.
<ul style="list-style-type: none"> • Documentation is completed according to industry recommended practice. 	<ul style="list-style-type: none"> • Explain how to ensure that the connection completes documentation according to industry recommended practice.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical tests. • Interviews. • Assignments. 	

Topic 9: Support a local area computer network

SUBJECT OUTCOME	
9.1 Maintain the performance of a local area computer network.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • Monitoring and tuning of the network ensures that operation and performance meet the manufacturers and organisation specifications. 	<ul style="list-style-type: none"> • Explain how monitoring and tuning of the network ensures operation and performance meet the manufacturer and organisation specifications.
<ul style="list-style-type: none"> • Network performance problems are resolved according to organisation specifications. 	<ul style="list-style-type: none"> • Explain how network performance problems are resolved according to organisation specifications.
<ul style="list-style-type: none"> • Accurate and up-to-date documentation of network resource utilisation is maintained. 	<ul style="list-style-type: none"> • Explain how to ensure that accurate and up-to-date documentation of network resource utilisation is maintained.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical exercises. • Interviews. • Assignments. 	

SUBJECT OUTCOME	
9.2. Execute procedures on a local area computer network.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The execution ensures that computer output is produced according to organisation specifications. 	<ul style="list-style-type: none"> • Explain how to ensure that computer output is produced according to specifications.
<ul style="list-style-type: none"> • Procedure messages are identified during execution, and actions are taken according to organisation specifications. 	<ul style="list-style-type: none"> • Identify procedure messages during execution, and the actions taken according to organisation specifications.
<ul style="list-style-type: none"> • Problems with procedures are identified, and action is taken according to organisation specifications. 	<ul style="list-style-type: none"> • Identify problems with procedures, and action taken according to organisation specifications.
<ul style="list-style-type: none"> • Potential improvements to procedures are identified, and action is taken according to organisation specifications. 	<ul style="list-style-type: none"> • Identify potential improvements to procedures, and action taken according to organisation specifications.
<ul style="list-style-type: none"> • Start-up and shutdown of the network are in accordance with the manufacturer's and organisation specifications. 	<ul style="list-style-type: none"> • Explain how to start-up and shutdown the network in accordance with the manufacturer's and organisation specifications.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical exercises. • Interviews. • Assignments. 	

SUBJECT OUTCOME	
9.3 Administer security systems for a local area network.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • Security exposures and violations are identified, and action is taken according to organisation policies, procedures and requirements. 	<ul style="list-style-type: none"> • Identify security exposures and violations and action taken according to organisation policies, procedures and requirements.
<ul style="list-style-type: none"> • Back-ups are made according to the organisation policies, procedures and specifications. 	<ul style="list-style-type: none"> • Explain how to make back-ups according to the organisation policies, procedures and specifications.
<ul style="list-style-type: none"> • Access to the network is provided according to organisation policies, procedures and specifications. 	<ul style="list-style-type: none"> • Explain how to provide access to the network according to organisation policies, procedures and specifications.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical exercises. • Interviews. • Assignments. 	

SUBJECT OUTCOME	
9.4 Maintain the supply of consumables for a LAN.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • A forecast of the rates of use of computer system consumables is justified using measurement of historical rates of use and anticipated events. 	<ul style="list-style-type: none"> • Explain how to forecast the rate of use of computer system consumables, using measurement of historical rates of use and anticipated events.
<ul style="list-style-type: none"> • Supply agreements are established and maintained so that the consumable supplies are available to meet demand. 	<ul style="list-style-type: none"> • Explain how to establish and maintain supply agreements so that the consumable supplies are available to meet demand.
<ul style="list-style-type: none"> • Stocks of consumable supplies meet forecasted demand. 	<ul style="list-style-type: none"> • Explain how forecasted demand meets stocks of consumable supplies.
<ul style="list-style-type: none"> • Overstock of consumable supplies are avoided. 	<ul style="list-style-type: none"> • Explain how to avoid overstock of consumable supplies.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical exercises. • Interviews. • Assignments. 	

SUBJECT OUTCOME	
9.5 Plan capacity for a LAN.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The plan includes a forecast based documentation of current network resource utilisation, historical growth and future plans. 	<ul style="list-style-type: none"> • Explain how to include a forecast based documentation of current network utilisation, historical growth and future plans.
<ul style="list-style-type: none"> • The plan includes recommendations for network changes that allow the network to meet the future capacity requirements. 	<ul style="list-style-type: none"> • Explain how to include recommendations for network changes that allow the network to meet the future capacity requirements.
<ul style="list-style-type: none"> • The feasibility of the recommendations is identified and explained and identified. 	<ul style="list-style-type: none"> • Explain and identify the feasibility of the recommendations.
<ul style="list-style-type: none"> • Actual resource usage is compared with forecast usage according to organisation requirements. 	<ul style="list-style-type: none"> • Compare actual resource usage with forecast usage according to organisation requirements.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical exercises. • Interviews. • Assignments. 	

SUBJECT OUTCOME	
9.6 Maintain the availability of a LAN.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The network is available and accessible according to organisation requirements. 	<ul style="list-style-type: none"> • Explain how to ensure the availability and accessibility of the network according to organisation requirements.
<ul style="list-style-type: none"> • Network availability problems are resolved according to organisation specifications. 	<ul style="list-style-type: none"> • Explain how to resolve network availability problems according to organisation requirements.

ASSESSMENT TASKS OR ACTIVITIES
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical exercises. • Interviews. • Assignments.

SUBJECT OUTCOME	
9.7 Manage changes to a LAN.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The impact and risks to the organisation of a proposed change are predicted. 	<ul style="list-style-type: none"> • Explain how to ensure that the management plan of a proposed change predicts the impact and risks to the organisation associated with the change.
<ul style="list-style-type: none"> • The timing of the proposed change minimises the impacts and risks. 	<ul style="list-style-type: none"> • Explain how the management plan ensures that the proposed change establishes when the change should occur to minimise the impacts and risks.
<ul style="list-style-type: none"> • The contingency plan that allows the network to be restored to a status acceptable to the user in the event of problems with the change. 	<ul style="list-style-type: none"> • Explain how the contingency plan will allow the network to be restored to a status acceptable to the user in the event of the problems with the change.
<ul style="list-style-type: none"> • Testing establishes the success of the installation and of the changes according to user and organisation requirements. 	<ul style="list-style-type: none"> • Explain how testing will establish the success of installation and of the changes according to user and organisation requirements.
<ul style="list-style-type: none"> • The people affected by the change are notified to minimise disruption to their activity. 	<ul style="list-style-type: none"> • Explain how to notify people affected by the change to minimise disruption to their activity.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical exercises. • Interviews. • Assignments. 	

Topic 10: Compare WAN with LAN

SUBJECT OUTCOME	
10.1 Explain wide area computer networks.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The components of a WAN are identified and their purpose outlined. 	<ul style="list-style-type: none"> • Identify the components of a WAN and outline their purpose.
<ul style="list-style-type: none"> • The purpose of a WAN is identified 	<ul style="list-style-type: none"> • Identify the purpose of a WAN.
<ul style="list-style-type: none"> • WAN configurations are identified and compared. 	<ul style="list-style-type: none"> • Identify and compare WAN configurations.
<ul style="list-style-type: none"> • WAN protocols are identified and compared. 	<ul style="list-style-type: none"> • Identify and compare WAN protocols.
<ul style="list-style-type: none"> • WAN transport media are identified and compared. 	<ul style="list-style-type: none"> • Identify and compare WAN transport media.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical exercises. • Interviews. • Assignments. 	

SUBJECT OUTCOME	
10.2. Evaluate a wide area computer network.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The method of implementation of the WAN is identified. 	<ul style="list-style-type: none"> • Identify the method of implementation of a WAN.
<ul style="list-style-type: none"> • Categories of the network components, the functions and examples are distinguished. 	<ul style="list-style-type: none"> • Distinguish categories of the network components, the functions and examples.
<ul style="list-style-type: none"> • The features and constraints of the network are identified and explained from a functional perspective. 	<ul style="list-style-type: none"> • Identify and explain the features and constraints of the network from a functional perspective.
<ul style="list-style-type: none"> • The alternative network designs are proposed and compared. 	<ul style="list-style-type: none"> • Propose and compare alternative network designs.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical exercises. • Interviews. • Assignments. 	

SUBJECT OUTCOME	
10.3. Explain network administration.	
ASSESSMENT STANDARD	LEARNING OUTCOME
<ul style="list-style-type: none"> • The tasks involved in network administration are identified and their requirements outlined. 	<ul style="list-style-type: none"> • Identify the tasks involved in network administration and outline their requirements.
<ul style="list-style-type: none"> • The explanation outlines, for a range of factors, how response times are affected. 	<ul style="list-style-type: none"> • Explain how response times are affected for a range of factors.
<ul style="list-style-type: none"> • The explanation outlines the principles of network interconnections. 	<ul style="list-style-type: none"> • Outline the principles of network interconnections.
<ul style="list-style-type: none"> • Network security administration procedures are outlined and explained. 	<ul style="list-style-type: none"> • Outline and explain network security administration procedures.
<ul style="list-style-type: none"> • Network administration documentation is completed. 	<ul style="list-style-type: none"> • Describe how to complete network administration documentation.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Observations. • Class tests. • Demonstrations. • Practical exercises. • Interviews. • Assignments. 	

4 SPECIFICATIONS FOR EXTERNAL ASSESSMENT IN DATA COMMUNICATION AND NETWORKING - LEVEL 4

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 during 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 during 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 4	KNOWLEDGE AND COMPREHENSION	APPLICATION	ANALYSIS, SYNTHESIS AND EVALUATION
	50%	25%	25%