



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATES (VOCATIONAL)

ASSESSMENT GUIDELINES

ELECTRONIC CONTROL AND DIGITAL ELECTRONICS NQF LEVEL 2

September 2007

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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 Electronic Control and Digital Electronics 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: Electronic Control and Digital Electronics* to prepare for and deliver Electronic Control and Digital Electronics. 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.

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 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 Portfolio of Evidence (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. They 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. It is a different way of assessment 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 simply be a total of ticks for right answers. Rubrics should explain the competence level descriptors for the skills, knowledge, values and attitudes (SKVAs) 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 ELECTRONIC CONTROL AND DIGITAL ELECTRONICS

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 Portfolio of Evidence (PoE) account for the other 50 percent.

The Portfolio of Evidence (PoE) and the external assessment include practical and written components. The practical assessment in Electronic Control and Digital Electronics 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

Electronic Control and Digital Electronics, 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 should at least 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 Portfolio of Evidence (PoE) must at least include:

- 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 tasks cannot be contained as evidence in the Portfolio of Evidence (PoE), its exact location must be recorded and it must be readily available for moderation purposes.

**ASSESSMENT OF
ELECTRONIC CONTROL AND DIGITAL ELECTRONICS
LEVEL 2**

3 INTERNAL ASSESSMENT OF SUBJECT OUTCOMES IN ELECTRONIC CONTROL AND DIGITAL ELECTRONICS – LEVEL 2

Topic 1: Components and Circuit Drawings

SUBJECT OUTCOME	
Use basic electronic tools and measuring equipment.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> The layout of breadboard is understood. The use of a voltmeter is demonstrated. 	<ul style="list-style-type: none"> Understand the layout of a breadboard by using an ohmmeter or continuity tester. Demonstrate the use of a voltmeter.
ASSESSMENT ACTIVITIES	
<ul style="list-style-type: none"> Use an ohmmeter on its lowest scale or continuity tester to demonstrate how a breadboard is connected internally. Use a voltmeter to measure voltage over a power supply. 	

SUBJECT OUTCOME	
Identify and rate basic electronic components.	
<i>Range: Resistors and potentiometers, capacitors (polarised and non-polarised), inductors, relays, transformers, diodes (rectifier, high speed, zener light emitting), bi-junction transistors and integrated circuits (regulators, analogue op-amps and digital gates)</i>	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> The components in the range are recognised. The components in the range are rated according to their physical sizes and markings. 	<ul style="list-style-type: none"> Recognise and name the components in the range. Indicate the rating of the components in the range by means of the physical markings on them.
ASSESSMENT ACTIVITIES	
<ul style="list-style-type: none"> Components in the range are recognised from physical examples and written examples. 	

SUBJECT OUTCOME	
Read and draw symbols of electronic components, elementary circuit drawings and elementary sketches.	
<i>Range: Resistors and potentiometers, capacitors (polarised and non-polarised), inductors, relays, transformers, diodes (rectifier, high speed, zener light emitting), bi-junction transistors and integrated circuits (regulators, analogue op-amps and digital gates)</i>	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> The symbols of the components in the range are recognised. The symbols of the components in the range are sketched. Elementary circuit drawings and elementary sketches are recognised, interpreted and sketched. 	<ul style="list-style-type: none"> Recognise the symbols of the components in the range. Sketch the symbols of the components in the range. Understand elementary circuit drawings and elementary sketches. Sketch elementary circuit drawings and elementary sketches.
ASSESSMENT ACTIVITIES	
<ul style="list-style-type: none"> The symbols are recognised from sketched examples and drawn on paper or appropriate medium. 	

SUBJECT OUTCOME	
Explain the functioning of electronic components.	
<i>Range: Resistors and potentiometers, capacitors (polarised and non-polarised), inductors, relays, transformers, diodes (rectifier, high speed, zener light emitting), bi-junction transistors and integrated circuits (regulators, analogue op-amps and digital gates)</i>	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> Components in the range are described according to their function, classification and operation. Resistors, capacitors, inductors, diodes and 	<ul style="list-style-type: none"> Classify the components in the range according to their functions. Describe the basic functions and operation of the

<p>transistors are tested for value and operation.</p> <ul style="list-style-type: none"> • Semi-conductors are looked up in manuals. • Working circuits of all digital gates are constructed and the results noted. 	<p>components in the range.</p> <ul style="list-style-type: none"> • Demonstrate the ability to test resistors, capacitors and inductors with the appropriate test equipment. • Demonstrate the ability to test diodes and bi-junction transistors with a diode tester or an ohmmeter (digital or analogue). • Demonstrate how to look up semi-conductor components in a technical manual. • Build working circuits using digital gates to construct truth tables from empirical evidence. <p><i>Range: Not (inverter), and, nand, or, nor, xor and xnor</i></p>
ASSESSMENT ACTIVITIES	
<ul style="list-style-type: none"> • Classification, function and operation of components in the range are explained verbally or in writing. • Testing is done practically using appropriate meters with results written down. • The operation of referencing components is practically demonstrated. • Circuits in the range are built on breadboard. Resultant truth tables are written on paper or appropriate medium. 	

SUBJECT OUTCOME	
Construct basic series and parallel circuits on breadboards.	
<i>Range: Resistors, capacitors and inductors</i>	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> • Arrangements of series and parallel circuits of the components in the range are calculated, built and measured. • The ability to mount, wire and connect components is demonstrated. 	<ul style="list-style-type: none"> • Demonstrate the ability to build series and parallel circuits on breadboards. • Calculate the outcomes of the built circuits and verify the outcomes using the appropriate meters. • Demonstrate the ability to mount, wire and connect components.
ASSESSMENT ACTIVITIES	
<ul style="list-style-type: none"> • Results of circuits in series and parallel are calculated, built on breadboards and measured using the appropriate meters. 	

Topic 2: Binary Theory and Basic Computer Components

SUBJECT OUTCOME	
Explain digital electronic principles.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> • Conversions are done between the binary and decimal systems and the decimal and binary systems and counting in the binary system is undertaken as well as construction of counting circuits using flip-flops and four-bit encoders and decoders using gates. • Voltage levels are used to explain how a computer distinguishes between the two binary possibilities. • Generation of and differentiation between odd and even parities is undertaken. • Working circuits of flip-flops are constructed and the results noted. • The purpose of shift registers is explained. 	<ul style="list-style-type: none"> • Demonstrate an ability to convert between the binary and decimal systems and vice versa by means of calculations. • Demonstrate an ability to count in the binary system. • Define and explain the binary system in terms of voltage levels. • Differentiate between odd and even parity and explain how they are generated. • Build working circuits using flip-flops to construct their truth tables from empirical evidence. <p><i>Range: D-type and JK-type and RS and T-type flip-flops simulated by using JK flip-flops</i></p> <ul style="list-style-type: none"> • Construct simple binary up/down counters (asynchronous and synchronous) using D-type and JK-type flip-flops from a circuit diagram. • Explain how encoding and decoding takes place by building each circuit type using gates. <p><i>Size: 4 bits</i></p> <ul style="list-style-type: none"> • Explain the purpose of shift registers.

ASSESSMENT ACTIVITIES
<ul style="list-style-type: none"> • Conversions between binary and decimal systems and vice versa are done in writing without the use of a calculator. • An ability to count up or down in binary to a minimum of four bits is demonstrated in writing. • The manner in which a computer distinguishes between binary levels is explained verbally or in writing. • Odd and even parity is generated in writing. • Circuits in the range are built on breadboards. Resultant truth tables are written on paper or appropriate medium. • Up/down counters are physically built on breadboards using flip-flops. • The function of encoding and decoding is demonstrated by building four-bit encoders and decoders using appropriate gates. • Shift registers are explained by means of a diagram using four bits that shows parallel and serial input and parallel and serial output. The purpose of shift registers is explained verbally or in writing.

SUBJECT OUTCOME	
Explain the functions of the basic components that make up a personal computer.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> • The differences between hardware, software and firmware are explained. • The components in the range are recognised and their functions are described. • The differences between volatile and non-volatile memories are explained. • Physical storage of binary levels in the memory devices in the range is explained. 	<ul style="list-style-type: none"> • Distinguish between hardware, software and firmware. • Recognise and name the components in a personal computer. <i>Range: Power supply and connections, motherboard and connections, CPU, RAM, ROM, secondary memories (hard disk, CD, DVD and flash memory), peripherals (monitor, keyboard, mouse, printer, fax, scanner) and ports (PS/2, VGA, RT-45, USB)</i> • Describe the functions of the components in a personal computer. <i>Range: Power supply and connections, motherboard and connections, CPU, RAM, ROM, secondary memories (hard disk, CD, DVD and flash memory), peripherals (monitor, keyboard, mouse, printer, fax, scanner) and ports (PS/2, VGA, RT-45, USB)</i> • Distinguish between volatile and non-volatile memories. • Explain how the binary levels are stored in the peripheral memory devices. <i>Range: Hard disk, CD, DVD and flash memory</i>
ASSESSMENT ACTIVITIES	
<ul style="list-style-type: none"> • Hardware, software and firmware are explained verbally or in writing using examples. • The components in the range are physically recognised and their functions are described verbally or in writing. • Volatile and non-volatile memories and the physical way binary levels are stored in the memory devices in the range are explained verbally or in writing. 	

Topic 3: Transducers Used In Process Control

SUBJECT OUTCOME	
Explain how controllers sense and react to physical conditions.	
<i>Range: Level, pressure, temperature and light</i>	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> • The difference between and the reason for and method of conversion between analogue and digital signals and vice versa are explained. • Examples of simple non-electrical instruments used to measure the physical conditions in the range and the limitations of these instruments are explained. • Examples of transducers that will sense the physical conditions in the range are recognised, named, 	<ul style="list-style-type: none"> • Distinguish between analogue signals and digital signals. • Explain how and why analogue signals are converted to digital signals and vice versa. • Recognise and name simple non-electrical examples of instruments that measure the physical conditions in the range. • Identify the limitations of using the instruments named

classified and their functions, constructions and basic operations are explained.	<p>as sensors for an electric controller.</p> <ul style="list-style-type: none"> • Recognise and name examples of transducers that sense the physical conditions in the range. • Classify the transducers named according to their functions. • Describe the function of the transducers named. • Describe the construction and basic operation of the transducers named.
ASSESSMENT ACTIVITIES	
<ul style="list-style-type: none"> • The purpose, difference and methods of A/D and D/A conversion is explained verbally or in writing. • Examples of non-electrical instruments that react to conditions in the range are recognised and named and their limitations are explained verbally or in writing. • Examples of transducers that react to conditions in the range are named, recognised, classified and described in terms of their functions, construction and operation verbally or in writing. 	

4 SPECIFICATION FOR EXTERNAL ASSESSMENT IN ELECTRONIC CONTROL AND DIGITAL ELECTRONICS – LEVEL 2

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 should be followed:

LEVEL 2	KNOWLEDGE AND COMPREHENSION	APPLICATION	ANALYSIS, SYNTHESIS AND EVALUATION
	50 - 60%	30 - 40%	0 - 10%