



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATES (VOCATIONAL)

ASSESSMENT GUIDELINES

ENGINEERING FABRICATION - SHEET METAL WORK NQF Level 3

September 2007

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 ENGINEERING FABRICATION - SHEET METAL WORK

- 1 Schedule of assessment**
- 2 Recording and reporting**
- 3 Internal assessment of Subject Outcomes in Engineering Fabrication - Sheet Metal Work – Level 3**
- 4 Specifications for the external assessment in Engineering Fabrication - Sheet Metal Work – Level 3**
 - 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 Engineering Fabrication and Sheet Metal Work 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: Engineering Fabrication and Sheet Metal Work* to prepare for and deliver Engineering Fabrication and Sheet Metal Work. 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 ENGINEERING FABRICATION - SHEET METAL WORK

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 Engineering Fabrication and Sheet Metal Work 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

Engineering Fabrication and Sheet Metal Work, 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 guide internal assessment in Engineering Fabrication and Sheet Metal Work Level 3:

NUMBER OF UNITS	ASSESSMENT	COVERAGE
2	Formal written tests	One or more completed topics
1	Internal written exam	All completed topics
3	Practical assessments	Must cover the related Subject Outcomes EXAMPLES: <ul style="list-style-type: none">• A research project on subject-related current issues from different sources, e.g. the Internet, magazines and newspapers• Fabrication of components in the sheet metal industry

**ASSESSMENT OF
ENGINEERING FABRICATION - SHEET METAL WORK
LEVEL 3**

3 INTERNAL ASSESSMENT OF SUBJECT OUTCOMES IN ENGINEERING FABRICATION - SHEET METAL WORK– LEVEL 3

Topic 1: Fabricate sheet metal components

SUBJECT OUTCOME	
1.1 Explain and demonstrate various aspects of sheet metal fabrication.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> Terminology specific to the sheet metal trade is correctly explained. Physical properties of metals and alloys used in sheet metal work correctly are identified and described. Hand and power operated equipment specific to the trade are correctly operated as per manufacturers' instructions. Self secured joints used in sheet metal work are made to internationally accepted standards. Reinforcement operations are correctly performed according to job requirements. 	<ul style="list-style-type: none"> Explain various terminologies specific to sheet metal work. Identify and describe the physical properties of metals and alloys used in sheet metal work. Operate hand and power tools and equipment specific to the trade. Make various self secured joints used in sheet metal work. Perform swaging, joggling, crimping and edge stiffening operations used in sheet metal work.
ASSESSMENT TASKS OR ACTIVITIES	
<p>Theory</p> <ul style="list-style-type: none"> Written test on terminologies used in sheet metal work. Research assignment on different metals and alloys used in sheet metal work. <p>Practical</p> <p>Students must select and use hand and power operated equipment to produce various self secured joints and perform different reinforcement operations.</p>	

SUBJECT OUTCOME	
1.2 Laying out and marking out complex patterns for fabrication.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> Patterns for regular and irregular shapes are correctly developed and a sound understanding of developments is clearly demonstrated. Application of isometric and orthographic projections is clearly demonstrated. Measuring and marking off tools are correctly selected for the job to be performed. Basic pattern calculations are correctly performed. Fundamental principles of lay-out are correctly applied and necessary allowances made. Cutting list and material list are correctly drawn up. 	<ul style="list-style-type: none"> Develop patterns for regular and irregular shapes that lie between parallel and inclined planes using different methods of development. Apply isometric and orthographic projections. Select and use measuring and marking out equipment as per job requirement. Perform basic pattern calculations. Determine allowances for cutting, bending and self secured joints. Apply the fundamental principles of laying out i.e. establish datum lines and set out points. Produce cutting and material lists for mass production.
ASSESSMENT TASKS OR ACTIVITIES	
<p>Theory</p> <p>Students must do pattern calculations for the right cone, the square to round and the hopper.</p> <p>Practical</p> <p>Students must develop patterns for: L-shaped hood, T-piece, Funnel, Twisted waste paper bin and a Five piece radius bend. Cutting and material list are to be made out for fabrication.</p>	

SUBJECT OUTCOME	
1.3 Shape and assemble parts.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> • Job instructions and specifications are followed and adhered to. • Appropriate tools and equipment are selected for the shaping operations. • Ability to operate different machines to form and shape parts is clearly demonstrated. • Parts of the components are assembled according to the drawing and specifications. • Safe working practices are clearly demonstrated during the shaping and assembly processes. 	<ul style="list-style-type: none"> • Interpret and follow job instructions and specifications. • Apply different shaping techniques used in sheet metal work. • Select and use tools and equipment for shaping and assembly of parts. • Shape and assemble parts as per drawing and specifications. • Adhere to safe working practices during the shaping and assembly process.
ASSESSMENT TASKS OR ACTIVITIES	
<p>Theory Students must write a summary of new experiences gained, difficulties experienced and make recommendations.</p> <p>Practical: Students to fabricate: L-shaped hood, Twisted waste paper bin and Funnel using patterns that were developed in previous Subject Outcome.</p>	

Topic 2: Join metals with the oxy-acetylene welding process

SUBJECT OUTCOME	
2.1 Prepare for the work activity.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> • General safety precautions and fire prevention measures are clearly and comprehensively explained. • Oxy-acetylene welding equipment is correctly identified and functions correctly described. • Oxy-acetylene equipment is assembled according to manufacturer's specification. • Pre-operational checks and tests on oxy-acetylene equipment are carried out. • Start-up and shut down procedures are correctly demonstrated. 	<ul style="list-style-type: none"> • Explain general safety precautions and fire prevention measures applicable to the oxy-acetylene welding process. • Identify and describe the functions of the main components for oxy-acetylene welding. • Assemble oxy-acetylene equipment according to manufacturer's specifications. • Carry out pre-operational checks and tests on oxy-acetylene equipment. • Demonstrate start-up and shut down procedures.
ASSESSMENT TASKS OR ACTIVITIES	
<p>Theory</p> <ul style="list-style-type: none"> • Written test on general safety applicable to oxy-acetylene welding. • Oral test on oxy-acetylene welding equipment and its functions. <p>Practical Students must set up the oxy-acetylene equipment, perform pre-operational tests and checks on the equipment and demonstrate correct start-up and shut down procedures.</p>	

SUBJECT OUTCOME	
2.2 Weld work pieces.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> • Provision for safety and fire hazards is made. • Welding symbols are correctly interpreted. • Different types of joints are correctly identified. • Gas pressures are correctly set for the type and thickness of the material. • Correct welding nozzle is selected for the type and thickness of material to be welded. • Ability to adjust welding flame to conform to type and thickness of material is correctly demonstrated. • Down hand welding technique is correctly applied. • Appropriate personal protective clothing is worn during the welding process. 	<ul style="list-style-type: none"> • Prepare the work area (provide for ventilation, fume extraction and fire hazards). • Explain and interpret welding symbols. • Identify different types of joints. • Adjust the welding flame to suit the type and thickness of metal that is to be welded. • Set the gas pressures to suit the type and thickness of metal that is to be welded. • Select the correct welding nozzle to weld the work pieces. • Weld metal in a down hand position using knowledge and skills acquired. • Identify the correct personal protective clothing that is to be worn.
ASSESSMENT TASKS OR ACTIVITIES	
<p>Theory Written test on welding symbols and welding joint.</p> <p>Practical Weld work pieces in the down hand position using low carbon material (mild steel plate) .Joints to be welded. Include the butt, fillet, lap and outside corner on material up to 2mm thick.</p>	

SUBJECT OUTCOME	
2.3 Apply quality checks on welded work pieces.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> • Welded joints are cleaned in accordance with job instructions and specifications. • Nature and causes of weld defects are correctly explained. • Welded joints comply with welding specified procedures (WSP) and drawing specifications. 	<ul style="list-style-type: none"> • Clean welded joints in accordance with job instructions and specifications. • Explain the nature and causes of oxy-acetylene welding defects. • Determine whether welded joints comply with welding specified procedures (WSP) and drawing specifications.
ASSESSMENT TASKS OR ACTIVITIES	
<p>Theory Students to write a summary of the WSP.</p> <p>Practical Students must clean work pieces. Welded work pieces must be devoid of any defects otherwise appropriate corrective actions are to be taken.</p>	

SUBJECT OUTCOME	
2.4 Care and store oxy-acetylene welding equipment and consumables.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> • Caring and storing procedures are correctly explained and carried out according to worksite procedure. • Oxy-acetylene equipment is dismantled as per work site practices. • Tools and equipment are stored as per worksite procedure. • Gas cylinders are stored safely in accordance with safety regulations. 	<ul style="list-style-type: none"> • Explain caring and storing procedure for tools and equipment according to worksite procedure. • Dismantle oxy-acetylene equipment as per worksite procedure. • Store tools and equipment according to worksite practices. • Store gas cylinders safely in accordance with safety regulations.

ASSESSMENT TASKS OR ACTIVITIES
<p>Theory Written test on the safe handling and storing of gas cylinders.</p> <p>Practical Dismantle and store equipment and cylinders.</p>

Topic 3: Install and erect sheet metal components for air-conditioning, dust extraction and ventilation systems

SUBJECT OUTCOME	
3.1 Interpret plant layout and component drawings.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> Plant layout and component drawings are examined and overview of job explained. Drawing clearly understood and mental visual picture is correctly created. Symbols, data and specification regarding gradients levels and heights are correctly interpreted. 	<ul style="list-style-type: none"> Examine plant layout and component drawings to gain an overview of the job. Apply understanding of the drawing to create a mental visual picture. Interpret symbols, data and specification in regard to gradients, levels and heights.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Assignment. Role play. Test/examination. Demonstration. 	

SUBJECT OUTCOME	
3.2 Plan and prepare to install system.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> The importance of planning and preparing for installing systems is correctly explained. Components are correctly identified and separated. Components are correctly examined for markings in accordance with the drawings. Tools, equipment and personal protective equipment for the installation are correctly identified and selected. The importance of job sequencing is correctly explained. 	<ul style="list-style-type: none"> Explain the importance of planning and preparing. Separate components to differentiate between inlet ducts, discharge ducts, cyclones and hopper boxes. Examine components to see if it is marked/ stamped according to the drawing. Identify and select tools, equipment personal protective equipment for the installation. Explain the importance of sequencing the job correctly.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> Assignment. Role play. Test/examination. Demonstration. 	

SUBJECT OUTCOME	
3.3 Install system.	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> • All health and safety regulations are complied with. • Basic rigging signals are clearly understood. • Instructions to the crane driver, using hand signals, are correctly communicated. • Lifting equipment is correctly selected. • Components are correctly placed in sequence. • Fasteners and brackets are correctly selected according to job/drawing specification. • Process is inspected for correct components and procedures. • System is installed to the required specification. • Worksite is left neat and devoid of safety hazards. • All relevant documentation is correctly completed. 	<ul style="list-style-type: none"> • Work safely at all times, complying with health and safety regulations. • Explain and demonstrate basic rigging hand signals. • Communicate with crane drivers using hand signals. • Select the correct lifting equipment as per job requirement. • Refer to drawings to sequentially place the correct components in the respective positions. • Choose fasteners and brackets as per job/drawing specifications. • Inspect the process at regular intervals to ensure that the correct components and procedures are used. • Check that the system is installed to the required specification. • Leave the worksite neat and devoid of safety hazards. • Complete all relevant documentation.
ASSESSMENT TASKS OR ACTIVITIES	
<ul style="list-style-type: none"> • Assignment. • Role play. • Test/examination. • Demonstration. 	

4 SPECIFICATIONS FOR EXTERNAL ASSESSMENT IN ENGINEERING FABRICATION - SHEETMETAL WORK – LEVEL 3

4.1 Integrated summative assessment task (ISAT)

A compulsory component of the external assessment (ESASS) is the **integrated summative assessment task (ISAT)**. The integrated summative assessment task (ISAT) draws on the student’s 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 3	KNOWLEDGE AND COMPREHENSION	APPLICATION	ANALYSIS, SYNTHESIS AND EVALUATION
	30%	50%	20%