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AIDS HELPLINE: 0800-0123-22 Prevention is the cure

CONTENTS • INHOUD*No.**Page
No. Gazette
No.***GOVERNMENT NOTICES****South African Qualifications Authority***Government Notices*

| | | | |
|-----|--|----|-------|
| 195 | National Standards Bodies Regulations: Standards Generating Body (SGB) for Air-conditioning, Refrigeration and Ventilation | 3 | 27366 |
| 196 | do.: Standards Generating Body (SGB) for Food Manufacturing | 5 | 27366 |
| 197 | do.: Standards Generating Body (SGB) for Engineering | 25 | 27366 |
| 198 | do.: Standards Generating Body (SGB) for Occupational Directed Practitioners | 75 | 27366 |

GOVERNMENT NOTICES

No. 195

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

11 March 2005

**SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)**

In accordance with regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Air-conditioning, Refrigeration and Ventilation

Registered by NSB 06, Manufacturing, Engineering and Technology, publishes the following unit standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the unit standards. The unit standards can be accessed via the SAQA web-site at www.saga.org.za. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, Hatfield Forum West, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the unit standards should reach SAQA at the address ***below and no later than 11 April 2005***. All correspondence should be marked **Standards Setting – SGB Air-conditioning, Refrigeration and Ventilation** and addressed to

The Director: Standards Setting and Development
SAQA

Attention: Mr. E. Brown

Postnet Suite 248

Private Bag X06

Waterkloof

0145

or faxed to 012 – 431-5144

e-mail: ebrown@saga.co.za


DUGMORE MPHUTHING**ACTING DIRECTOR: STANDARDS SETTING AND DEVELOPMENT**



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

1

Maintain safety in the handling of ammonia refrigerant

| SAQA US ID | UNIT STANDARD TITLE | | |
|--|--|----------------------------|--------------------|
| 119267 | Maintain safety in the handling of ammonia refrigerant | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Air-conditioning Refrigeration and Ventilation | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Manufacturing and Assembly | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 9 | Level 3 | Regular |

SPECIFIC OUTCOME 1

Discuss the properties of Ammonia refrigerant and the hazards when used as a refrigerant.

SPECIFIC OUTCOME 2

Discuss the use of ammonia in refrigeration systems.

SPECIFIC OUTCOME 3

List, explain and demonstrate the safety procedures when handling of ammonia refrigerant.

SPECIFIC OUTCOME 4

Demonstrate the safe handling of ammonia.

SPECIFIC OUTCOME 5

List and demonstrate the methods of detecting ammonia in the atmosphere.

No. 196

11 March 2005

**SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)**

In accordance with regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Food Manufacturing

Registered by NSB 06, Manufacturing, Engineering and Technology, publishes the following qualification and unit standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the qualifications unit standards. The qualification and unit standards can be accessed via the SAQA web-site at www.saga.org.za. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, Hatfield Forum West, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the unit standards should reach SAQA at the address *below and no later than 11 April 2005*. All correspondence should be marked **Standards Setting – SGB for Food Manufacturing** and addressed to

The Director: Standards Setting and Development
SAQA

Attention: Mr. E Brown

Postnet Suite 248

Private Bag X06

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e-mail: ebrown@saga.co.za


DUGMORE MPHUTHING
ACTING DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Diploma: Clear Fermented Beverage Processing: Brewing

| SAQA QUAL ID | QUALIFICATION TITLE | | |
|----------------------|--|----------------------------|-------------------------|
| 49532 | National Diploma: Clear Fermented Beverage Processing: Brewing | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Food | Manufacturing, Engineering and Technology | | |
| QUAL TYPE | FIELD | SUBFIELD | |
| National Certificate | Manufacturing, Engineering and Technology | Manufacturing and Assembly | |
| ABET BAND | MINIMUM CREDITS | NQF LEVEL | QUALIFICATION CLASS |
| Undefined | 240 | Level 6 | Regular-Unit Stds Based |

PURPOSE AND RATIONALE OF THE QUALIFICATION

A person acquiring this qualification will be able to manage and produce a safe quality assured, clear fermented beverage product within a brewery environment by controlling, analysing and optimising processing conditions, human resources and associated financial costs in order to achieve a product that meets market specifications.

This qualification will contribute to the full development of the learner within the food and beverages processing environment by providing recognition, further mobility and transportability within the field of manufacturing and assembly. The skills, knowledge and understanding demonstrated within this qualification are essential for social and economic transformation and contribute to the upliftment and economic growth within the food and beverage manufacturing and processing environment.

The typical learner identified to benefit from the qualification will be a person with the technical and operational responsibility of producing a fermented beverage within a brewery environment. This qualification has been developed in partnership with the Institute and Guild of Brewing. The syllabus of the Associate Membership Examination (AME) is reflected within the core unit standards of the qualification. This qualification will fill a priority identified by the Food and Beverage SETA sector skills plan. This qualification will provide a continuation from basic beverage brewing qualifications and forms the basis of further learning in the management of the manufacture of beer. This qualification will improve the effectiveness and productivity of the beverage manufacturing process in South Africa and thus provide an impetus for improved global competitiveness.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

The credits and related unit standards require that the learner has knowledge and experience in clear beverage fermentation processes at a minimum level of the General Certificate in Brewing and Packaging from the Institute and Guild of Brewing. Some supplementary learning may be required in the fields of Chemistry, Microbiology and Engineering principles up to NQF 5.

Recognition of prior learning

This qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience.

QUALIFICATION RULES

Level, credits and learning components assigned to the qualification

The rules of combination for a Level 6 qualification advocate flexibility in terms of credits assigned at fundamental core and elective levels.

The level assigned to this qualification is appropriate because a range of well-developed knowledge and skills is required within a significant choice of procedures.

The accountability for production includes decision-making, problem solving, people management and some basic research in order to optimise the technical processes within tightly controlled costs.

The qualification consists of fundamental, core and elective components.

In the fundamental component of the qualification, a learner must be able to demonstrate management competencies in the immediate and broader contexts.

The fundamental and core components of the qualification reflect the mandatory minimum clear fermented beverage skills and knowledge needed in order to be transportable in the food or beverage manufacturing environment.

To supplement the management competencies of a typical learner, at least 16 credits must be achieved from the elective component of the qualification. Attainment of all the above mentioned unit standards comprises the minimum qualification credit requirement. Minimum 240

The additional elective unit standards are optional thereby enabling the learner to compound additional credits relevant to the particular learning context.

EXIT LEVEL OUTCOMES

1. Integrate knowledge of Fermented Beverage Processing (Brewing science and technology) in order to manage the various processes of fermented beverage production to produce a specific product: This includes

- > Measuring and analysing process data
- > Identifying non conformance
- > Problem Solving
- > Implementing Corrective Action

2. Optimise processing conditions in order to successfully brew, ferment and clarify a quality fermented beverage product that meets market specifications. This includes

- > Integration of appropriate hygienic requirements at each processing stage
- > Optimisation of energy usage
- > Minimisation of process losses
- > Prevention of re-work
- > Integration and management of quality systems

3. Control and Manage process outputs with cognisance to safety health and environmental issues.

This includes:

- > Managing and Controlling Effluent
- > Applying relevant environmental and occupational health and safety legislation

4. Manage and Control Raw Materials

- > Selecting raw materials for use in the manufacture of beer
- > Managing the processing of raw materials

5. Manage Human Resources

- > Applying relevant personnel procedures
- > Applying relevant labour legislation
- > Setting performance goals and measures
- > Formulating individual and team development plans
- > Evaluating performance

6. Apply sound financial management practices and techniques including:

- > Understanding the principles of budgeting and working within the limits of a budget
- > Interpreting financial statements
- > Compiling financial reports
- > Interpreting and analysing business data

ASSOCIATED ASSESSMENT CRITERIA

1.

- > Manage and control the brew house process according to standard operating procedure
- > Measure, analyse and interpret brew house process and quality data according to standard operating procedure
- > Identify non conformance to brew house process and product
- > Manage and implement corrective actions to the brew house process

2

- > Manage and control the fermentation process according to standard operating procedure
- > Measure, analyse and interpret fermentation process and quality data according to standard operating procedure
- > Identify non conformance to fermentation process and product
- > Manage and implement corrective actions to the fermentation process

3

- > Manage and control the filtration process according to standard operating procedure
- > Measure, analyse and interpret filtration process and quality data according to standard operating procedure
- > Identify non conformance to filtration process and product
- > Manage and implement corrective actions to the filtration process

4

- > Raw materials are managed and controlled according to standard operating procedure
- > Fermented beverage processing equipment cleaning and sanitation is managed and controlled according to standard operating procedure.
- > Apply knowledge of occupational, health and environmental legislation relevant to fermentation beverage processing according to standard operating procedure.
- > Apply knowledge of fermented beverage processing science to manufacturing process.
- > Apply knowledge of the packaging process and trade in the fermented beverage processing according to standard operating procedure

5.

- > Manage and control human resource practices according to world-class manufacturing principles
- > Identify and apply relevant personnel procedures according to company standards
- > Identify and apply relevant requirements according to current labour legislation.
- > Implement change management practices according to recognised best practices
- > Performance goals are set which are measurable, achievable and aligned to individual career paths and company objectives.
- > Performance is evaluated using evidence which is valid, current and sufficient

6.

- > Manage and control financial resources according to world class manufacturing principles
- > Set budgets according to the required company standards
- > Control budgets according to company standards
- > Key financial items on a financial statement are interpreted according to financial principles
- > Business reports are prepared which are accurate and concise

Integrated assessment

The applied competence (practical, foundational and reflexive competencies) of this qualification implies the learner will be able to produce a safe, quality assured fermented product by managing and, controlling the production plant

The identifying and solving of problems, team work, organising one-self, the using of applied science, the implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

The Associate Membership Examination of the Institute and Guild of Brewing will form part of the assessment of the theory of brewing science and technology for this qualification.

Applicable assessment tool(s) must be used to establish the foundational, reflexive and embedded knowledge to problem solving and application of the world as a set of related systems within the processing

environment.

A detailed portfolio of evidence is required to proof the practical, applied and foundational competencies of the learner.

Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods.

Whilst individual Unit Standards and Skills Programmes should be formatively and summatively assessed, a holistic summative assessment against the exit level outcomes of the entire qualification must be conducted as a discrete event. Assessors should recognise prior learning by assessing and granting credit for evidence that learning that has already been acquired through formal, informal and non-formal learning and work experience.

INTERNATIONAL COMPARABILITY

The Associate Membership Examination of the Institute and Guild of Brewing, upon which this qualification is based, is recognised internationally in the English-speaking Brewing World by manufacturers of fermented beverage products (beer), equipment manufactures and suppliers, suppliers of materials, academic institutions and research organisations.

ARTICULATION OPTIONS

The qualification will enable the qualifying learner to progress to learning for additional qualifications in fermented beverage specific contexts, or develop the qualification further to include learning and research at NQF 7.

The fundamental and elective unit standards are generic to management type qualifications within the manufacturing industry and therefore credit may be transferred to a differently scoped technological fermented beverage qualification at the same NQF Level.

MODERATION OPTIONS

- > Anyone assessing a learner or moderating the assessment of a learner against this Qualification must be registered as an assessor with the relevant ETQA.
- > Any institution offering learning that will enable the achievement of this Qualification must be accredited as a provider with the relevant ETQA.
- > Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQA's policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQA's (including professional bodies); and in terms of the moderation guideline detailed immediately below.
- > Moderation must include both internal and external moderation of assessments at exit points of the qualification, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

For an applicant to register as an assessor, the applicant needs:

- > Well developed interpersonal skills, subject matter and assessment experience.
- > The assessor needs to be competent in the Planning and Conducting Assessment of Learning Outcomes as described in the unit standards Plan and Conduct Assessment of Learning Outcomes NQF level 5. The subject matter expertise must be well developed within the field of Fermented Beverage Processing (Brewing).
- > A qualification similar to the National Diploma in Fermented Beverage Processing (Brewing) with a minimum of 6-12 months relevant field expertise after he/she has completed the qualification.
- > The subject matter expertise of the assessor can be established by recognition of prior learning.
- > Assessors need to be registered with the relevant Education and Training Quality Assurance Body.
- > Detailed documentary proof of educational qualification, practical training undergone, and experience

gained by the applicant must be provided (Portfolio of Evidence).

NOTES

This qualification will replace 22052, "Diploma Brewing" Level 5, Credits 240, as soon as it is registered.

UNIT STANDARDS

(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

| | UNIT STANDARD ID AND TITLE | LEVEL | CREDITS | STATUS |
|-------------|---|---------|---------|----------------------------|
| Core | 119275 Manage and Control Raw Materials | Level 6 | 25 | Draft - Prep for P Comment |
| Core | 119276 Achieve consumer quality beer properties | Level 6 | 25 | Draft - Prep for P Comment |
| Core | 119277 Manage yeast supply | Level 6 | 10 | Draft - Prep for P Comment |
| Core | 119278 Optimise process technology | Level 6 | 15 | Draft - Prep for P Comment |
| Core | 119279 Control clear beer fermentation systems | Level 6 | 30 | Draft - Prep for P Comment |
| Core | 119281 Demonstrate knowledge of brewing microbiology | Level 6 | 30 | Draft - Prep for P Comment |
| Core | 119282 Manufacture wort | Level 6 | 22 | Draft - Prep for P Comment |
| Core | 119283 Manage beer clarity | Level 6 | 10 | Draft - Prep for P Comment |
| Core | 119284 Optimise the cleaning and sanitising of a beer manufacturing environment | Level 6 | 10 | Draft - Prep for P Comment |
| Core | 119285 Manage effluent, waste and environmental factors | Level 6 | 9 | Draft - Prep for P Comment |
| Core | 119287 Mature and store green beer | Level 6 | 10 | Draft - Prep for P Comment |
| Elective | 13952 Demonstrate basic understanding of the Primary labour legislation that impacts on a business unit | Level 4 | 8 | Registered |
| Elective | 10148 Supervise a project team of a business project to deliver project objectives | Level 5 | 14 | Reregistered |
| Elective | 13068 Apply the concept of management accounting techniques in an advanced manufacturing environment | Level 6 | 8 | Registered |
| Elective | 119280 Manage plant design and maintenance for a food or sensitive consumer manufacturing environment | Level 6 | 8 | Draft - Prep for P Comment |
| Fundamental | 11473 Manage individual and team performance | Level 4 | 8 | Registered |
| Fundamental | 10631 Demonstrate an understanding of manufacturing, principles, methodologies and processes | Level 5 | 7 | Reregistered |
| Fundamental | 115407 Apply the principles of change management in the workplace | Level 5 | 10 | Registered |
| Fundamental | 10606 Apply financial and business principles in a manufacturing environment | Level 6 | 8 | Reregistered |
| Fundamental | 10608 Manage a quality assurance system in a sensitive consumer product manufacturing environment | Level 6 | 9 | Reregistered |
| Fundamental | 119288 Demonstrate knowledge of the packaging process and the trade | Level 6 | 12 | Draft - Prep for P Comment |



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

1

Optimise quality during food or sensitive consumer product handling

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|---|----------------------------|--------------------|
| 119286 | Optimise quality during food or sensitive consumer product handling | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Food | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Manufacturing and Assembly | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 9 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Demonstrate an understanding of the relevant quality management system.

SPECIFIC OUTCOME 2

Monitor the quality during food or sensitive consumer product handling.

SPECIFIC OUTCOME 3

Control the quality during food or sensitive consumer product handling.

SPECIFIC OUTCOME 4

Implement quality improvements for food or sensitive consumer product handling.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

2

Achieve consumer quality beer properties

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|----------------------------|
| 119276 | | Achieve consumer quality beer properties | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Food | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Manufacturing and Assembly |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 25 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Manage and control the brewing process.

SPECIFIC OUTCOME 2

Measure, analyse and interpret process and quality data.

SPECIFIC OUTCOME 3

Identify and describe non conformance.

SPECIFIC OUTCOME 4

Manage and implement corrective actions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

3

Control clear beer fermentation systems

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|---|----------------------------|--------------------|
| 119279 | Control clear beer fermentation systems | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Food | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Manufacturing and Assembly | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 30 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Manage and control the fermentation process.

SPECIFIC OUTCOME 2

Measure analyse and interpret process data.

SPECIFIC OUTCOME 3

Identify non conformance.

SPECIFIC OUTCOME 4

Manage and implement corrective actions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

4

Demonstrate knowledge of brewing microbiology

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|----------------------------|
| 119281 | | Demonstrate knowledge of brewing microbiology | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Food | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Manufacturing and Assembly |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 30 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Select yeast suitable for the manufacture of beer.

SPECIFIC OUTCOME 2

Store and maintain yeast cultures.

SPECIFIC OUTCOME 3

Determine the degree of microbial contamination present during the manufacture of beer.

SPECIFIC OUTCOME 4

Prevent microbial contamination.

SPECIFIC OUTCOME 5

Manage and implement corrective actions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

5

Demonstrate knowledge of the packaging process and the trade

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|--|----------------------------|--------------------|
| 119288 | Demonstrate knowledge of the packaging process and the trade | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Food | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Manufacturing and Assembly | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 12 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Demonstrate knowledge of packaging plant and process.

SPECIFIC OUTCOME 2

Demonstrate knowledge of the relationship between packaging and product quality.

SPECIFIC OUTCOME 3

Demonstrate knowledge of the supply chain from warehouse to customer.

SPECIFIC OUTCOME 4

Demonstrate knowledge of trade quality implications.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

6

Manage and Control Raw Materials

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|----------------------------|
| 119275 | | Manage and Control Raw Materials | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Food | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Manufacturing and Assembly |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 25 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Select the suitable raw materials for use in the manufacture of beer.

SPECIFIC OUTCOME 2

Manage and control the processing of raw materials.

SPECIFIC OUTCOME 3

Measure, analyse and interpret process data.

SPECIFIC OUTCOME 4

Identify non conformance.

SPECIFIC OUTCOME 5

Manage and implement corrective actions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

7

Manage beer clarity

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|---|----------------------------|--------------------|
| 119283 | Manage beer clarity | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Food | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Manufacturing and Assembly | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 10 | Level 6 | Regular |

SPECIFIC OUTCOME 1

The principles of sedimentation and centrifugal sedimentation as applied to beer clarification are compared and contrasted.

SPECIFIC OUTCOME 2

Measure analyse and interpret process data.

SPECIFIC OUTCOME 3

Identify non conformance.

SPECIFIC OUTCOME 4

Manage and implement corrective actions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

8

Manage effluent, waste and environmental factors

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|--|----------------------------|
| 119285 | | Manage effluent, waste and environmental factors | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Food | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Manufacturing and Assembly |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 9 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Manage and control the effluent and waste treatment process.

SPECIFIC OUTCOME 2

Measure analyse and interpret process data.

SPECIFIC OUTCOME 3

Identify non conformance.

SPECIFIC OUTCOME 4

Manage and implement corrective actions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

9

Manage yeast supply

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|---|----------------------------|--------------------|
| 119277 | Manage yeast supply | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Food | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Manufacturing and Assembly | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 10 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Manage and control brewery yeast supply.

SPECIFIC OUTCOME 2

Measure analyse and interpret process data.

SPECIFIC OUTCOME 3

Identify non conformance.

SPECIFIC OUTCOME 4

Manage and implement corrective actions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

10

Manage plant design and maintenance for a food or sensitive consumer manufacturing environment

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|--|----------------------------|
| 119280 | | Manage plant design and maintenance for a food or sensitive consumer manufacturing environment | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Food | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Manufacturing and Assembly |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 8 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Analyse a manufacturing plant design, maintenance and product technology.

SPECIFIC OUTCOME 2

Manage and control improvements projects for plant design, maintenance and product technology.

SPECIFIC OUTCOME 3

Review improvement plan effectiveness.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

11

Manufacture wort

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|----------------------------|
| 119282 | | Manufacture wort | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Food | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Manufacturing and Assembly |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 22 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Manage and control the brewhouse process.

SPECIFIC OUTCOME 2

Measure analyse and interpret process and quality data.

SPECIFIC OUTCOME 3

Identify non-conformance.

SPECIFIC OUTCOME 4

Manage and implement corrective actions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

12

Mature and store green beer

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|---|----------------------------|--------------------|
| 119287 | Mature and store green beer | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Food | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Manufacturing and Assembly | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 10 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Manage and control the beer maturation and storage process.

SPECIFIC OUTCOME 2

Measure, analyse and interpret process data.

SPECIFIC OUTCOME 3

Identify non conformance.

SPECIFIC OUTCOME 4

Manage and implement corrective actions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

13

Optimise process technology

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|----------------------------|
| 119278 | | Optimise process technology | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Food | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Manufacturing and Assembly |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 15 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Manage and control process technology.

SPECIFIC OUTCOME 2

Measure and analyse processing conditions used to manufacture beer.

SPECIFIC OUTCOME 3

Identify non conformance.

SPECIFIC OUTCOME 4

Manage and implement corrective actions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

14

Optimise the cleaning and sanitising of a beer manufacturing environment

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|--|---|----------------------------|
| 119284 | Optimise the cleaning and sanitising of a beer manufacturing environment | | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Food | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Manufacturing and Assembly |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 10 | Level 6 | Regular |

SPECIFIC OUTCOME 1

Manage and control the cleaning process.

SPECIFIC OUTCOME 2

Measure and analyse the effectiveness of the cleaning process.

SPECIFIC OUTCOME 3

Identify non-conformance of the cleaning process.

SPECIFIC OUTCOME 4

Manage and implement corrective action.

No. 197

11 March 2005

Established in terms of Act 58 of 1995**SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)**

In accordance with regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Engineering

Registered by NSB 06, Manufacturing, Engineering and Technology, publishes the following qualification and unit standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the qualifications unit standards. The qualification and unit standards can be accessed via the SAQA web-site at www.saqo.org.za. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, Hatfield Forum West, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the unit standards should reach SAQA at the address ***below and no later than 11 April 2005***. All correspondence should be marked **Standards Setting – SGB for Engineering** and addressed to

The Director: Standards Setting and Development
SAQA

Attention: Mr. E Brown

Postnet Suite 248

Private Bag X06

Waterkloof

0145

or faxed to 012 – 431-5144

e-mail: ebrown@saqa.co.za


DUGMORE MPHUTHING
ACTING DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

B Tech: Engineering Technology

| SAQA QUAL ID | QUALIFICATION TITLE | | |
|-----------------------|---|--------------------------------|---------------------|
| 49509 | B Tech: Engineering Technology | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| QUAL TYPE | FIELD | SUBFIELD | |
| National First Degree | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | MINIMUM CREDITS | NQF LEVEL | QUALIFICATION CLASS |
| Undefined | 480 | Level 7 | Regular-ELOAC |

PURPOSE AND RATIONALE OF THE QUALIFICATION

The purpose of the qualification is to develop the necessary knowledge, understanding and skills required for learner's further learning towards becoming competent practicing engineering technologists. It is intended to subsequently empower candidate engineering technologists to demonstrate that they are capable of applying their acquired knowledge, understanding, skills, attitudes and values in the work environments in South Africa. It is designed also to add value to the qualifying learner in terms of enrichment of the person, status and recognition.

A person achieving this qualification will be able to:

- > Competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills to the solution of broadly defined problems in the field of engineering while operating within the relevant standards and codes.
- > Demonstrate well-rounded general engineering knowledge, as well as systematic knowledge, of the main terms, procedures, principles and operations of one of the disciplines of engineering.
- > Gather evidence from primary sources and journals using advanced retrieval skills, and organize, synthesize and present the information professionally in a mode appropriate to the audience.
- > Apply the knowledge gained to new situations, both concrete and abstract, in the workplace/community.
- > Identify, analyse, conduct and manage a project.
- > Make independent decisions/judgments taking into account the relevant technical, economic, social and environmental factors.
- > Work independently, as a member of a team, and as a team leader.
- > Relate engineering activity to health, safety and environment, cultural, and economic sustainability.
- > Meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technologist.
- > Demonstrate the capacity to explore and exploit educational, entrepreneurial, and career opportunities, and to develop him/herself professionally.
- > Proceed to postgraduate studies, both course-based and research based.

Rationale

The Engineering profession contributes to the technological, socio-economic, built environment and environmental infrastructure of the country, facilitating socio-economic growth and sustainability.

A 480 Credit Qualification in Engineering Technology is designed to meet the needs of the country in respect of engineering competence.

The target markets include both a traditional branch of engineering, and/or a significant industrial area. The qualification is the starting point of a career path in one of the areas of specialization, but is still generic enough to allow maximum mobility, based on recognition of prior learning, within the industry. Skills, knowledge, values and attitudes reflected in the qualification are building blocks for the development of candidate engineering technologists towards becoming competent engineering technologists.

The qualification is intended to:

- > Promote the development of engineering knowledge and skills that are required to serve public and private needs.
- > Release the potential of people.
- > Provide opportunities for people to move up the value chain.
- > Provide learners with life-long learning and articulation opportunities in the engineering profession.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

At the entry level, the learner is assumed to be proficient at NQF Level 4, or equivalent, in:

- > Mathematics
- > Physical Science.
- > English and the language of instruction

The first 360 credits of this qualification is the same as the 360 credits of the corresponding National Diploma. If this qualification is offered to candidates who have completed the corresponding National Diploma, then the entrance qualification will be the National Diploma and the candidate will be given exemption of the corresponding 360 credits (or the qualification that will replace the National Diploma after implementation of the NAP and HEQF)

Recognition of prior learning

Providers may make use of recognition of prior learning at intermediate levels but must take full responsibility for assuring that the exit level outcomes are fulfilled.

QUALIFICATION RULES

NQF level and assigned credits

The programme leading to the qualification shall be a 480 minimum credits or equivalent programme with a minimum of 120 credits at the present NQF Level 7.

Knowledge profile of the graduate

The content of the programme when analysed by knowledge area shall not fall below the minimum credit values of the total actual credit for the programme specified for each knowledge area in Table 1. Knowledge areas are defined in Appendix A.

Minimum curriculum content by knowledge area

Knowledge Area : Credits

Mathematical Sciences: 40

Basic Sciences: 20

Engineering Sciences: 120

Engineering Design: 50

Computing and IT: 40

Complementary Studies: 20 & 50

Subtotal: 290

Discretionary to reach at least the minimum total: (190)

Total: 480

The discretionary component allows for flexibility in providing for the diverse needs of the different engineering disciplines. It shall be allocated to the six knowledge areas, to form a coherent, balanced programme.

Core and specialist requirements

The allocation of credits shall result in a coherent core of mathematics, basic sciences and fundamental engineering sciences that provides a viable platform for further studies and lifelong learning. The coherent core enables development in a traditional discipline or in an emerging field. The coherent core embraces both fundamental and core elements as defined by SAQA.

A programme shall contain specialist engineering discipline specific learning outcomes at the exit level. Discipline specific learning may lead to core (compulsory) or elective credits.

In the Complementary Studies area, the programme is expected to contain a balance of material.

EXIT LEVEL OUTCOMES

1: Problem Solving

Apply engineering principles to systematically diagnose and solve broadly defined engineering problems.

Range: Problems are Stage 1 broadly-defined engineering problems having some or all of the following characteristics:

- > Problems require identification and analysis, may be ill-posed and have a degree of uncertainty.
- > Problems may be unfamiliar, but are capable of interpretation for solution by technologies in practice area.
- > Approach solution using structured analysis techniques in well-accepted and innovative ways.
- > Information is complex and possibly incomplete, requires validation and supplementation and compilation into information base.
- > Solutions may be partially outside standards and codes, may require judgement, may operate outside standards and codes with justification.
- > Involves a variety of factors which may impose conflicting constraints.

2: Application of Scientific and Engineering Knowledge

Demonstrate the application of mathematical, science and engineering knowledge in an engineering environment.

Range: Knowledge is characterized by some or all of the following:

- > Coherent range of fundamental principles in mathematics, basic science and engineering science underlying a sub-discipline or recognised practice area.
- > Coherent range of fundamental principles in engineering science and technology underlying an engineering sub-discipline or recognised practice area.
- > Systematic body of knowledge in specialist area or recognised practice area.
- > Professional communication, social impact, environmental impact, cost analysis, quality procedures.
- > Use of engineering technology, supported by established models, physical principles and mathematics to aid solving technological problems.

3: Engineering Design

Perform procedural and non-procedural design of broadly defined components, systems, works, products or processes to meet desired needs within applicable standards, codes of practice and legislation.

Range: Design problems conform to the definition of Stage 1 broadly-defined engineering problems given with ELO 1

4: Communication

Communicate technical, supervisory and general management information effectively, both orally and in writing, using appropriate language and terminology, structure, style and graphical support.

Range: Communicate professional work to peers, other disciplines, client and stakeholder audiences, selecting appropriate modes of communication

5: Engineering Management

Apply engineering management principles and concepts to engineering activities.

6: Project Development

Identify, analyse, conduct and manage a project.

Range: Investigation and/or research and development

7: Application of Complementary Knowledge

Demonstrate a critical awareness of the impact of engineering activity on the social, industrial and physical environment, and of the need to act professionally within own limits of competence.

Range: The combination of social, workplace (industrial) and physical environmental factors must be appropriate to the discipline or other designation of the qualification. Evidence may include case studies typical of engineering practice situations in which the graduate is likely to participate.

Critical Cross-Field Outcomes and Equivalent Exit Level Outcome

- > Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made. Exit Level Outcomes 1, 2, 3, 6, 7
- > Working effectively with others as a member of a team, group, organisation and community. Exit Level Outcomes 2, 3, 4, 6, 7
- > Organising and managing oneself and one's activities responsibly and effectively. Exit Level Outcomes 3, 5, 6, 7
- > Collecting, analysing, organising and critically evaluating information. Exit Level Outcomes 1, 2, 3, 4, 6
- > Communicating effectively using visual, mathematical and/or language skills. Exit Level Outcomes 1, 2, 3, 4, 6, 7
- > Using science and technology effectively and critically, showing responsibility toward the environment and health of others. Exit Level Outcomes 1, 2, 3, 5, 6, 7
- > Demonstrating an understanding of the world as a set of related systems by recognising that problem contexts do not exist in isolation. Exit Level Outcomes 1, 2, 3, 6, 7
- > Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:
 - Reflecting on and exploring a variety of strategies to learn more effectively. Exit Level Outcomes 2, 7
 - Participating as responsible citizens in the life of local, national and global communities. Exit Level Outcomes 2, 3, 7
 - Being culturally and aesthetically sensitive across a range of contexts. Exit Level Outcomes 3, 4, 5, 7
 - Exploring education and career opportunities. Exit Level Outcomes 5, 7
 - Developing entrepreneurial opportunities. Exit Level Outcomes 5, 7

ASSOCIATED ASSESSMENT CRITERIA**Competency and Range and Assessment Criteria**

- 1.1 Identify and define the problem.
 - 1.1.1 A broadly-defined engineering problem/desired outcome is identified.
 - 1.1.2 The factors/variables influencing the problem are identified.
 - 1.1.3 Criteria against which a solution can be measured are identified.
 - 1.1.4 A clear description of the problem and its effects on the whole system is provided.
 - 1.1.5 The relevant assumptions, premises and constraints are identified and recorded
- 1.2 Gather information relating to the problem.
 - 1.2.1 Information relating to the problem is gathered.
 - 1.2.2 Appropriate data collection methods are applied.
 - 1.2.3 Statistical methods are applied to information sampling.
 - 1.2.4 Facts and evidence are distinguished from assumptions and inferences.
 - 1.2.5 Related systems and sub-systems are identified.
- 1.3 Analyse the information relating to the problem.
 - 1.3.1 Available information is assessed for accuracy and relevance.
 - 1.3.2 Appropriate systems analysis tools are chosen.
 - 1.3.3 Mathematics, basic science, engineering science and practical experience are applied as required.
 - 1.3.4 Sound engineering judgement is applied in the process.
 - 1.3.5 Relevant information is presented in a methodical and logical format comprehensible to peers/co-workers and team leaders.

- 1.4 Evaluate and select appropriate methodologies for the problem solution.
 - 1.4.1 Appropriate solution methodologies are evaluated.
 - 1.4.2 Appropriate systemic tools and techniques are identified to remedy the problem.
 - 1.4.3 The preferred solution methodology is stated and justified.
 - 1.4.4 The solution methodology takes workplace safety into account.
- 1.5 Synthesize potential solutions to the problem.
 - 1.5.1 Sound engineering judgement is applied within the system.
 - 1.5.2 Fundamental engineering principles are applied when necessary.
 - 1.5.3 Mathematics, basic science, engineering science, systems engineering and practical experience are applied as required.
 - 1.5.4 Appropriate assistance is obtained when required.
 - 1.5.5 Potential/relevant solutions are proposed.
- 1.6 Evaluate and select the preferred solution.
 - 1.6.1 The potential solutions are tested for technical, economic and operational feasibility.
 - 1.6.2 The impact of the potential solution on other systems, sub-systems and processes is determined.
 - 1.6.3 The preferred solution is articulated in a logical and methodical manner. Range: Oral, written
 - 1.6.4 The system is tested to ensure that the problem has been solved.
 - 1.6.5 The preferred solution appropriately addresses the premises, assumptions, constraints and desired outcomes.
- 2.1 Demonstrate competence to use and integrate appropriate mathematical, basic science and engineering principles to solve engineering problems. □
 - 2.1.1 The correct approach to solving the problem is chosen and justified using given criteria.
 - 2.1.2 The problem is described using appropriate mathematical, basic science and engineering principles.
 - 2.1.3 The solution to the engineering problem is demonstrated.
 - 2.1.4 The solution is validated against the desired outcome.
 - 2.1.5 The preferred solution appropriately addresses the premises, assumptions, constraints and desired outcomes.
- 2.2 Demonstrate competence to use and apply appropriate measuring instruments and techniques to solve engineering problems.
 - 2.2.1 Appropriate measuring instruments are chosen and justified.
 - 2.2.2 Calibration of the measuring instrument is validated.
 - 2.2.3 Valid measuring techniques are correctly applied.
 - 2.2.4 The observations are correctly recorded, analysed and evaluated.
 - 2.2.5 The preferred solution appropriately addresses the premises, assumptions, constraints and desired outcomes.
- 2.3 Describe and perform the operation and maintenance of resources / processes / systems.
 - 2.3.1 The operation of equipment and components / products / processes / systems is described and explained, both practically and theoretically.
 - 2.3.2 Equipment is successfully operated against specified requirements.
Range: Performed independently and under supervision
 - 2.3.3 An appropriate maintenance strategy is chosen and performed.
- 2.4 Plan, implement, report and improve on engineering processes.
 - 2.4.1 A problem associated with a typical engineering process is identified and possible improvements suggested.
 - 2.4.2 Modifications to components / products / processes / systems are identified, planned, and performed in line with appropriate engineering strategies.
 - 2.4.3 The candidate makes a significant contribution both as an individual, and as a member of a team.
 - 2.4.4 Continuous improvements to the system / process are applied.
- 3.1 Identify and analyse specific project objectives, and plan and formulate the criteria for an acceptable design solution.
 - 3.1.1 The problem / design is contextualised, and the implications of the design are described.
 - 3.1.2 The candidate's role within the multidisciplinary / team project is identified and outlined, including his/her relationship / line function to the team leader / supervisor.
 - 3.1.3 The scope of the project / design is identified and defined.
 - 3.1.4 Internal and external factors influencing the design including codes of practice and legislation are identified and recorded.
 - 3.1.5 A strategy and critical path to solve the problem is formulated.

3.1.6 The relevant assumptions, premises and constraints are identified and recorded.

3.2 Access, acquire and evaluate the relevant knowledge, information and resources.

3.2.1 Available information (knowledge and data) is assessed for accuracy and completeness.

3.2.2 New information that is required is identified.

3.2.3 Relevant sources of information are identified (library, internet, scientific data banks, etc).

3.2.4 Relevant data and information are collected, collated, analysed and synthesized.

3.2.5 New information / missing data is generated by applying appropriate procedures such as experimental, computational or deductive reasoning.

3.2.6 Relevant information is presented in a logical and methodical manner.

3.3 Generate and analyse alternative solutions by applying appropriate engineering knowledge.

3.3.1 Standard and non-procedural methodologies / correlations are used to generate solutions.

3.3.2 Any non-procedural methods are synthesised and justified using scientific reasoning.

3.3.3 Solutions are analysed and evaluated to test their validity, feasibility and their potential integration into larger system/s.

3.4 Select the optimal solution based on technical, operational and economic criteria, and evaluate the impacts and benefits of the proposed design.

3.4.1 Solutions are evaluated using defined criteria and ranked according to appropriateness and preferability.

Range: Costs, benefits, advantages, limitations.

3.4.2 The selection of the preferred solution relative to other solutions is justified.

3.4.3 The preferred solution is further evaluated in terms of economic, social and environmental impacts.

3.4.4 The preferred solution / design is optimised with the aid of computational / simulation tools.

3.4.5 A sensitivity analysis of the preferred solution is undertaken.

3.4.6 The preferred solution appropriately addresses the premises, assumptions, constraints and desired outcomes.

3.5 Implement the solution.

3.5.1 An implementation strategy and plan is devised.

3.5.2 The responsibilities of team members are recognised / delegated and documented for the successful implementation of the solution.

3.5.3 The implemented solution is evaluated against the initial design criteria specifications.

3.6 Communicate the design logic and information in the appropriate format.

3.6.1 The design is presented in an acceptable technical report format.

3.6.2 The content is selected and arranged in a logical manner and graphics are integrated appropriately.

3.6.3 Correlations / methodologies used are clearly stated, justified and referenced.

3.6.4 All assumptions are stated and justified.

3.6.5 Technical and professional vocabulary is used throughout the report.

4.1 Generate and assemble appropriate data and information, using available resources.

4.1.1 An appropriate search methodology is used to gather data and information.

4.1.2 Data and information is clustered into logical themes/sub-themes.

4.1.3 Sources of information are listed, identifying the various concepts/ideas obtained from each source.

4.1.4 Reference lists are compiled and displayed according to a standard convention.

4.2 Interpret technical data.

Range: Technical books, Management manuals, Periodicals, Data packs, Technical, Research and Management reports

4.2.1 Technical, supervisory and general management data and categories are created and selected to organise information pertaining to the documents.

4.2.2 Information is appropriately transferred from one form into another.

4.2.3 A computer is effectively used to process, produce and present data.

4.2.4 Valid conclusions are drawn from technical, supervisory and general management data.

4.3 Apply graphical techniques to present information effectively.

Range: Line graphs, histograms, pie charts, bar charts, line graphs, polar plots and 3D graphs.

4.3.1 Data/information that could best be displayed graphically is identified.

4.3.2 Graphical tools within the selected software package(s) are used to produce an effective graphical presentation of the data.

4.4 Generate, construct and assemble technical documents.

Range: Technical specifications and project reports

4.4.1 An appropriate type of workplace document for the purpose is chosen and justified against selected criteria.

4.4.2 The structure, style and language are appropriate to the document type.

4.4.3 Tables, figures and other graphical techniques are appropriately integrated.

4.4.4 Task- and readership-appropriate style, register and vocabulary are assessed against given criteria.

4.5 Communicate interactively with individuals and with members of a group.

Range: Meetings

4.5.1 Ideas are presented clearly and logically.

4.5.2 Ideas from other individuals are encouraged.

4.5.3 Listening skills are demonstrated

4.5.4 Effective and confident participation in discussions is demonstrated.

4.5.5 A comprehensive report on the outcome of discussions, including the views of all participants is presented orally and/or in writing.

4.6 Generate, construct, assemble and deliver a technical presentation

Range: A multi-disciplinary audience. Project overviews and reports, end-results, conclusions and recommendations.

4.6.1 The needs and knowledge of a simulated audience are identified and information is pitched at the appropriate level.

4.6.2 An appropriate presentation format is chosen according to the occasion.

4.6.3 Presentation slides and handout documentation is produced using effective layouts and formats.

4.6.4 A variety of effective verbal presentation techniques are used with confidence.

4.6.5 The verbal presentation is integrated with the visual aids / electronic media to communicate the information effectively.

5.1 Apply entrepreneurial principles to engineering activities.

Range: product, service or process.

5.1.1 Criteria for a successful entrepreneur in a specialised field are identified.

5.1.2 A prototype / innovation / systems improvement is conceptualised.

Range: technical and economic feasibility.

5.1.3 Various components of a business plan are identified and presented.

5.1.4 The effects of the prototype / innovation / systems improvement are assessed.

Range: social or environmental.

5.1.5 The relevant assumptions, premises and constraints are identified and recorded.

5.2 Practice engineering management principles.

Range: General engineering operations and at least two of the following: Quality assurance maintenance, procurement, operation, safety, environment, human resources.

5.2.1 Principles are described and applied to a project, process or operation.

5.2.2 Performance measures/benchmarks are identified.

5.2.3 A performance monitoring plan is developed.

5.2.4 Projects, processes and/or operations are monitored and controlled.

5.2.5 An action plan is devised (when deviations from the norm occur).

5.3 Formulate and evaluate a project / process plan.

5.3.1 Project management fundamentals are described and applied.

5.3.2 Constraints relating to the project are identified.

5.3.3 Project resources are identified.

5.3.4 A project plan is formulated and documented.

5.3.5 Productivity issues relating to the project / process are considered.

6.1 Formulate a project.

6.1.1 The project is identified and described.

6.1.2 The purpose, importance and significance of the study is presented.

6.1.3 The specific tasks in the study are identified.

6.1.4 The resource requirements are estimated.

6.1.5 A time framework for the study is provided.

6.1.6 The relevant assumptions, premises and constraints are identified and recorded.

6.2 Describe and justify the theoretical framework and methodology to address the project.

6.2.1 Relevant sources of information on the project brief are surveyed.

6.2.2 Related systems and sub-systems are identified.

6.2.3 Key questions / problems / issues are identified.

6.2.4 The relevant theoretical framework is described, justified and applied.

6.2.5 The relevant methodology to address the project brief is described and justified.

6.2.6 A project proposal is presented.

6.3 Conduct and manage the project.

6.3.1 The project investigation / development is conducted in accordance with industry practice.

6.3.2 Appropriate data collection methods are applied.

6.3.3 Statistical methods are applied to information sampling

6.3.4 Observations made are consistently and accurately recorded.

6.3.5 The project process is successfully managed.

6.4 Analyse the information gained / results of the project.

6.4.1 Facts and evidence are distinguished from assumptions and inferences.

6.4.2 Optimum process conditions are identified through analyses of results in accordance with process requirements.

6.4.3 Errors and redundancies are identified through analyses of the data in accordance with standard statistical methods.

6.5 Draw conclusions / Make recommendations based on the project.

6.5.1 Valid conclusions are drawn based on the results of the project.

6.5.2 Recommendations for process / product optimisation are developed from the results of experiments and trials in accordance with organisation requirements, resources, and constraints.

6.5.3 Implications of applying recommendations to actual industrial processes / products are identified and described in accordance with process requirements and environmental, economic, and safety factors.

6.6 Produce a report of the completed work.

6.6.1 An abstract that clearly states the problem investigated, the methodology and equipment used, the results obtained and the conclusions drawn, is produced.

6.6.2 A properly referenced literature survey is presented.

6.6.3 The methodology and equipment used is described

6.6.4 The data, analysis, results, discussion, and recommendations are presented in accordance to organisational requirements.

6.6.5 The complete project appropriately address/complies with the premise/s, constraints, assumptions and desired outcome(-s).

7.1 Relate engineering activity to environmental, cultural and safety issues.

7.1.1 A problem in a workplace process is identified and possible improvements applied.

7.1.2 Pertinent social issues, safety and environmental laws and regulations are identified.

7.1.3 Criteria are selected for the critical assessment of environmental management techniques and technologies

7.1.4 Potential hazards and their consequences are identified.

7.1.5 The potential impact of engineering activity on social and environmental issues is critically evaluated.

7.1.6 Relevant environmental management and safety principles are applied and justified.

7.1.7 An environmental assessment of an aspect of the workplace is carried out.

7.1.8 The relevant assumptions, premises and constraints are identified and recorded.

7.2 Exhibit awareness of the need for professionalism.

7.2.1 Reasons for maintaining continued competence and for keeping abreast of up-to-date tools and techniques are listed.

7.2.2 The system of professional development is described.

7.2.3 The boundaries of competence in problem solving and design are discerned.

7.2.4 Decision making is limited to area of current competence.

7.2.5 Judgment is displayed in decision making during problem solving and design.

7.2.6 The design or solution of a problem is justified in terms of ethical considerations.

7.2.7 The learner accepts responsibility for own actions.

Integrated assessment

Providers of programmes shall in the quality assurance process demonstrate that an effective integrated assessment strategy is used. Clearly identified components of assessment must address summative assessment of the exit level outcomes. Evidence should be derived from major work or multiple instances of limited scale work.

INTERNATIONAL COMPARABILITY

International comparability of the whole qualification standard is ensured through the Sydney Accord. The standards are comparable with those for qualifications in engineering in countries having comparable engineering education systems to South Africa, namely, Australia, Canada, Ireland, New Zealand and the United Kingdom. Comparability is audited by mutual visits.

ARTICULATION OPTIONS

The exit level outcomes ensure that a graduate of a programme meeting these standards would meet requirements for entry to a number of programmes including:

- > A learnership programme leading to the qualification required for registration as a Professional Engineering Technologist.
- > A learnership programme leading to the qualification required for registration as a Professional Certificated Engineer/Competent Engineering Practitioner.
- > Formal specialist study towards post-graduate qualifications in Engineering;
- > Specialist coursework masters programmes.
- > Research masters programmes, with or without coursework components.
- > With responsible work experience, the Master of Business Administration.

MODERATION OPTIONS

Providers of programmes shall in the quality assurance process demonstrate that an effective moderation process exists to ensure that the assessment system is consistent and fair.

Registration of assessors is delegated to the Higher Education and Training (HET) providers responsible for programmes.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

N/A

NOTES

Qualifiers:

The qualification may have a disciplinary or cross-disciplinary qualifier (discipline, branch, option or endorsement) defined in the provider's rules for the technology qualification and reflected on the academic transcript and technology qualification certificate, subject to the following:

- (a) The designation must contain the word "Engineering". The qualifier may contain one or more combinations of the following descriptors: Chemical, Civil, Computer, Electrical, Electro-mechanical, Industrial, Mechanical, Metallurgical and Mining. Designations are not restricted to this list.
- (b) The qualifier must clearly indicate the nature and purpose of programme.
- (c) The fundamental engineering science content must be consistent with the qualifier.
- (d) The target market indicated by the qualifier may be a traditional branch of engineering or a substantial industry area.
- (e) In the case of a provider offering programmes with minor differences in content, only one programme should be accredited.
- (f) The designation should be comparable with typically occurring programmes within Sydney Accord countries.

Definition of Knowledge Areas**Basic Sciences**

Physics (including mechanics), chemistry, earth sciences and the biological sciences which focus on understanding the physical world, as applicable in each engineering disciplinary context.

Complementary Studies

Those disciplines outside of engineering sciences, basic sciences and mathematics which:

- > Are essential to the practice of engineering, including engineering economics, the impact of technology on society and effective communication; and
- > Broaden the student's perspective in the humanities and social sciences in order to understand the world in which engineering is practised.

Computing and Information Technologies

The use of computers, networking and software to support engineering activity, and as an engineering activity in itself, as appropriate to the discipline.

Engineering Design and Synthesis

The creative, iterative and often open-ended process of conceiving and developing components, systems and processes. Design requires the integration of engineering, basic and mathematical sciences, working under constraints, taking into account economic, health and safety, social and environmental factors, codes of practice and applicable laws.

Engineering Sciences

These are rooted in the mathematical and physical sciences, and where applicable, in other basic sciences, but extend knowledge and develop models and methods in order to lead to engineering applications and solve engineering problems.

Mathematical Sciences

This is an umbrella term embracing the techniques of mathematics, numerical analysis and statistics cast in an appropriate mathematical formalism.

Calculation of SAQA Credits and Allocation to Knowledge Area

The method of calculation assumes that certain activities are scheduled on a regular weekly basis while others can only be quantified as a total activity over the duration of a course or module. This calculation makes the following assumptions:

1. Classroom or other scheduled contact activity generates notional hours of the student's own time for each hour of scheduled contact. The total is given by a multiplier (see third column of table below) applied to the contact time.
2. One week of full time activity accounts for assessments in a semester.
3. Assigned work generates only the notional hours judged to be necessary for completion of the work and is not multiplied.

Define for each course or module identified in the Rules for the technology qualification: □

Type of Activity - Time Unit in hours - Contact time multiplier

L = number of lectures per week - Tl = duration of a lecture period - Mt = total work per lecture period

T = number of tutorial per week - Tt = duration of a tutorial period - Mt = total work per tutorial period

P = total practical periods - Tp = duration of an institution-based practical period - Mp = total work per practical period

X = total other contact periods - Tx = duration of other period - Mx = total work per other period

A = total assignment non-contact hours - Ta = 1 hour

D = total no of days of workplace-based learning - Td = duration of work-based learning per day -

Md = total workplace-based learning per period.

W = number of weeks the course lasts (actual + 2 week per semester for assessment, if applicable to the course or module)

The credit for the course is calculated using the formula:

$$C = \{W(LTl Ml + TTt Mt) + PTp Mp + XTx Mx + ATa + DTd Md\}/10$$

The resulting credit for a course or value may be divided between more than one knowledge area. In allocating the credit for a course to multiple knowledge areas, only new knowledge or skills in a particular area may be counted. Knowledge and skills developed in other courses and used in the course in question shall not be counted. Such knowledge is classified by the nature of the area in which it is applied. In summary, no knowledge is counted more than once as being new.

MD may differ for different activities e.g. the factor for work-based learning component in which the learner develops skills which integrate theoretical knowledge with actual practice in a working environment will differ from the factor for a related assignment and project work which enhances learner understanding of the work environment and/or new learning.

All learning that is assigned credits must satisfy the following criteria:

- > The competencies to be achieved and contributions to knowledge areas are clearly defined and documented.

- > The learning is quality assured by the provider.
- > A student's performance is assessed against defined outcomes.
- > Evidence of the assessment process is presented in the accreditation evaluation.

UNIT STANDARDS

(Note: A blank space after this line means that the qualification is not based on Unit Standards.)



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Lift Inspection

| SAQA QUAL ID | QUALIFICATION TITLE | | |
|----------------------|---|--------------------------------|-------------------------|
| 49511 | National Certificate: Lift Inspection | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| QUAL TYPE | FIELD | SUBFIELD | |
| National Certificate | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | MINIMUM CREDITS | NQF LEVEL | QUALIFICATION CLASS |
| Undefined | 150 | Level 5 | Regular-Unit Stds Based |

PURPOSE AND RATIONALE OF THE QUALIFICATION

This qualification is aimed at people who work or intend to work within the lift industry, and who seek recognition for essential skills in lift and escalator inspection.

Recipients of this qualification know about and are able to conduct lift inspections to ensure user safety in lift and escalator operations.

The qualification is designed to be flexible and accessible so that people are able to demonstrate the competencies required to work safely in the lift industry.

People credited with this qualification are able to:

- > Communicate in a variety of ways.
- > Use mathematics in real life situations.
- > Conduct electrical measurements.
- > Conduct mechanical measurements.
- > Release entrapped passengers from immobile lift.
- > Inspect and test lifts and escalators.
- > Produce and maintain administrative reports.
- > Manage projects.

Rationale:

The South African legislation specifies that all lifts must be inspected at least every three years by a registered lift inspector, and that new installations must also be inspected prior to being commissioned for use. This qualification provides a learner with all the skills and knowledge required of a lift inspector and may be seen as a pathway towards registration as a lift inspector.

The majority of the candidates for this qualification are likely to be working in the lift industry. This qualification will give them the opportunity to balance their practical skills with the essential knowledge needed to earn a formal qualification in lift inspection without formal education becoming an impassable barrier.

There is a critical need in the industry to identify people who are able to conduct the essential operations associated with efficient and safe lift inspection. This will lead to competence in the field of work and thereby add value to the industry and improve the economy of the country. It will also lead to a balanced society in that learners will understand how the work they do fits into the greater engineering industry.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that candidates embarking on learning towards this qualification are already competent in the following areas:

- > Working at heights and in confined spaces.
- > Mathematics at NQF level 4.
- > Safe working practices.
- > Basic knowledge of electrical theory.
- > Basic knowledge of engineering practices.
- > The ability to select, use and care for electrical measuring instruments.
- > The ability to select, use and care for engineering measuring equipment.
- > The ability to read and interpret engineering drawings.

Recognition of prior learning:

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the defined exit level outcomes and/or individual unit standards.

Evidence can be presented in various ways, including international and/or previous local qualifications, products, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records.

All such evidence will be judged in accordance with the general principles of assessment described above and the requirements for integrated assessment.

QUALIFICATION RULES

Fundamental:

- > Candidates are required to achieve all 52 credits listed in the fundamental category, as these will enhance the learner's ability to learn towards the core unit standards.

Core:

- > Candidates must achieve all 72 credits listed in the core category in Exit Level Outcomes.

Elective:

- > Candidates must achieve at least 26 credits of their choice from any of the available elective credits in Exit Level Outcomes. In order to achieve an Exit Level Outcome, candidates must achieve all of the credits for that particular ELO.

EXIT LEVEL OUTCOMES

1. Communicate at work.
2. Use mathematics and statistics in real life situations.
3. Release entrapped passengers from immobile lift.
4. Inspect and test lifts and escalators.
5. Produce and maintain administrative reports.
6. Manage projects.

Exit Level Outcome; Possible credits F*; C*; E*:

- > Communicate at work; 18; ;
- > Use mathematics and statistics in real life situations; 26; ;
- > Release entrapped passengers from immobile lift; ; 4;
- > Inspect and test lifts and escalators; ; 46;
- > Produce and maintain administrative reports; ; 22; 13
- > Manage projects; 8; ; 20
- > Totals; 52; 72; 33
- > Credits required; 52; 72; 26

*Note: F = Fundamentals; C = Core; E = Elective

Critical cross-field outcomes:

This qualification addresses the following critical cross-field outcomes, as detailed in the unit standards:

- > Identifying and solving problems in which responses indicate that responsible decisions using critical and creative thinking have been made.
 - > Use mathematics and statistics in real life situations.
 - > Release entrapped passengers from immobile lift.
 - > Inspect and test lifts and escalators.
 - > Produce and maintain administrative reports.
 - > Manage projects.
- > Working effectively with others as a member of a team, group, organisation or community.
 - > Communicate at work.
 - > Release entrapped passengers from immobile lift.
 - > Produce and maintain administrative reports.
 - > Manage projects.
- > Organising and managing oneself and one's activities responsibly and effectively.
 - > Inspect and test lifts and escalators.
 - > Produce and maintain administrative reports.
 - > Manage projects.
- > Collecting, analysing, organising and critically evaluating information.
 - > Inspect and test lifts and escalators.
 - > Produce and maintain administrative reports.
 - > Manage projects.
- > Communicating effectively using visual, mathematical and/or language skills in the modes of oral/written persuasion.
 - > Communicate at work.
 - > Use mathematics and statistics in real life situations.
 - > Produce and maintain administrative reports.
 - > Manage projects.
- > Using science and technology effectively and critically, showing responsibility towards the environment and health of others.
 - > Release entrapped passengers from immobile lift.
 - > Inspect and test lifts and escalators.
- > Demonstrating and understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
 - > Inspect and test lifts and escalators.
 - > Produce and maintain administrative reports.
 - > Manage projects.

Learning programmes directed towards this qualification will also contribute to the full personal development of each learner and the social and economic development of society at large, by making individuals aware of the importance of:

- > Reflecting on and exploring a variety of strategies to learn more effectively.
- > Participating as responsible citizens in the life of local, national and global communities.
- > Being culturally and aesthetically sensitive across a range of social contexts.
- > Exploring education and career opportunities; and developing entrepreneurial opportunities.

ASSOCIATED ASSESSMENT CRITERIA

1.
 - > Oral communication is maintained and adapted as required to promote effective interaction in a work context.
 - > Information is accessed from standing instructions, visual information and a range of other workplace texts and responses where required are appropriate to the context.

> Written communication is clear and unambiguous and at an appropriate level for designated target audiences.

2.

> Mathematical functions are used correctly to solve routine workplace problems and tasks.

> Findings on life related problems are interrogated in terms of their cause and solution.

> Mathematical techniques are effectively and accurately applied in real life situations.

3.

> Entrapped passengers are safely released from an immobile lift.

> Unsafe conditions are identified and corrective actions are taken.

> Access to workplace is limited to involved personnel only.

4.

> Inspections comply with manufacturers standards and statutory requirements.

> Understanding of the relevant OHS and SANS requirements is demonstrated.

> Unsafe conditions are identified and corrective actions are taken.

> Access to workplace is limited to involved personnel only.

> Electrical circuits are tested in accordance with manufacturer standards.

5.

> Reports are generated, stored and retrieved.

> Different paths are used for obtaining information for schedules.

> Corrective action is implemented to improve quality of project work.

> Reports are used in providing administrative and financial control of the business.

6.

> Tasks are prioritised to meet project deadlines.

> Analyses of work requirements are compared with relevant business plans and microenvironment.

> Potential risks that may affect project performance are recognised and appropriate actions are taken.

> Legislation that may impact on the work environment is identified and actions are taken to direct work activities to comply with the legislation.

> Requirements are ordered and procured in advance of being required.

For award of the whole qualification, candidates must achieve the required number of credits as specified in the rules of combination in point 15 as well as the criteria specified for integrated assessment in point 18 below.

Should candidates exit the qualification without completing the whole qualification, recognition may be given for each Exit Level Outcome achieved. For award of a particular Exit Level Outcome, candidates must achieve:

> All the Core and Elective unit standards associated with the particular Exit Level Outcome as per the specifications contained within each unit standard.

> The criteria specified for integrated assessment in point 18 below.

Integrated assessment:

Assessment will take place according to the detailed specifications indicated in the unit standards associated with each exit level outcome.

Over and above the achievement of the specified unit standards, evidence of integration will be required as per the following broad criteria, all within the context of workplace activities.

Assessors should note that the evidence of integration (as below) could well be presented by candidates when being assessed against the unit standards - thus there should not necessarily be separate assessments for each unit standard and then further assessment for integration. Well designed assessments should make it possible to gain evidence against each unit standard while at the same time gain evidence of integration.

Candidates must demonstrate the ability to engage in the operations selected in an integrative way, dealing with divergent and "random" demands related to these work operations, effectively. Evidence is required that the candidate is able to achieve the purpose of the qualification as a whole at the time of the award of the qualification. Integration of skills will be demonstrated through the achievement of the core operational

standards.

Assessment principles:

Assessment should be in accordance with the following general and specific principles:

- > The initial assessment activities should focus on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. Where assessment at title level is unmanageable, then the assessment can focus on each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
- > Evidence must be gathered across the entire range specified in each unit standard, as applicable. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to prove that the candidate is able to perform in the real situation.
- > All assessments should be conducted in accordance with the following universally accepted principles of assessment:
 - > Use appropriate, fair and manageable methods that are integrated into real work-related or learning situations.
 - > Judge evidence on the basis of its validity, currency, authenticity and sufficiency.
 - > Ensure assessment processes are systematic, open and consistent.

INTERNATIONAL COMPARABILITY

This qualification and the component unit standards have been compared with similar qualifications from the following countries:

- > New Zealand.
- > Australia.

The New Zealand qualification, "National certificate in Lifts and Escalators - level 4" has strands in installation and servicing. Installation strand consists of a total of 265 credits, and servicing strand consists of 283 credits.

The Australian qualification, "National Diploma in Lift Systems (Technician)" has 70 credits and is geared towards a lift mechanic.

Neither of these unit standards based qualifications represent the requirements of the lifts industry in South Africa, therefore this qualification was developed from scratch.

ARTICULATION OPTIONS

This qualification has been designed and structured so that qualifying learners can move from one context to another. It builds on the National Certificate in Lift Mechanics (Level 4) and acts as a springboard from which learners may progress to other qualifications in the engineering industry.

Employers or institutions should be able to evaluate the outcomes of this qualification against the needs of their context and structure top-up learning appropriately.

The following table shows the location of this qualification in terms of other qualifications within the engineering field.

NQF Level; Mechanical Engineering; Lifts; Electrical Engineering:
 6; ND Mechanical Engineering; ; ND Electrical Engineering
 5; NC Mechanical Engineering; NC Lift Inspection; NC Electrical Engineering
 4; ; NC Lift Mechanics; ;

Learners can move vertically or horizontally by using this qualification as the basis for any of the qualifications indicated at or above level 5. This qualification comprises some engineering based unit standards and learners will be able to enter either mechanical or electrical engineering programmes.

Structure of the qualification:

The qualification has the following general structure:

The rationale and purpose provides, among other things, a broad description of what holders of the qualification can do.

The qualification is further defined by means of a number of Exit-Level Outcomes. These ELOs provide a means for candidates to exit the qualification with recognition for clusters of competencies, even if they do not achieve the whole qualification. The ELOs also provide a means to organise the unit standards into coherent clusters, thus facilitating integrated assessment.

Each ELO is further defined by means of the associated unit standards. Some of these unit standards may be indicated as core (compulsory), while others may be identified as electives, with rules of combination provided. Assessment criteria are provided for each ELO where required, mainly to address the need for evidence of integration of competencies.

Each unit standard contains details of specific outcomes, range statements and assessment criteria, thus making it possible for assessors to judge competence in terms of each unit standard, while at the same time providing possible evidence of integration of competencies.

MODERATION OPTIONS

> Providers offering learning towards achievement of any of the unit standards that make up this qualification must be accredited through the relevant ETQA.

> Internal moderation of assessment must take place at the point of assessment with external moderation provided by the relevant ETQA in conjunction with the Lift Industry, according to the moderation guidelines and the agreed ETQA procedures.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessors registered with the relevant ETQA and/or the Lifts Industry must carry out the assessment of candidates for any of the unit standards that make up this qualification. The following criteria are specified for assessors concerning the technical aspects of the qualification:

- > An appropriate qualification with at least eight years experience in a lift environment.
- > Appropriate experience and understanding of assessment theory, processes and practices.
- > Good interpersonal skills and ability to balance the conflicting requirements of the interests of the learner, the provider and the employer.

NOTES

N/A

UNIT STANDARDS

(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

| | UNIT STANDARD ID AND TITLE | LEVEL | CREDITS | STATUS |
|----------|--|---------|---------|----------------------------|
| Core | 10133 Schedule project activities to facilitate effective project execution | Level 4 | 8 | Reregistered |
| Core | 10144 Identify, suggest and implement corrective actions to improve quality | Level 4 | 6 | Reregistered |
| Core | 13781 Release entrapped passengers from immobile lift | Level 4 | 4 | Draft - Prep for P Comment |
| Core | 119256 Inspect and test electrical circuits | Level 4 | 6 | Draft - Prep for P Comment |
| Core | 119257 Produce and maintain work activity reports | Level 4 | 8 | Draft - Prep for P Comment |
| Core | 119246 Inspect and test escalator and passenger conveyor equipment | Level 5 | 12 | Draft - Prep for P Comment |
| Core | 119249 Inspect and test lift car and counterweight equipment | Level 5 | 5 | Draft - Prep for P Comment |
| Core | 119268 Inspect and test lift machine room equipment | Level 5 | 15 | Draft - Prep for P Comment |
| Core | 119269 Inspect and test lift well equipment | Level 5 | 5 | Draft - Prep for P Comment |
| Core | 119270 Inspect and test lift pit equipment | Level 5 | 3 | Draft - Prep for P Comment |
| Elective | 10141 Contribute to the management of project risk within own field of expertise | Level 4 | 5 | Reregistered |
| Elective | 10142 Fulfill procurement activities and supervise procurement administration | Level 4 | 8 | Reregistered |

| | | | | |
|-------------|--|---------|----|--------------|
| Elective | 13941 Apply the budget function in a business unit | Level 4 | 5 | Registered |
| Elective | 114592 Produce business plans for a new venture | Level 4 | 8 | Registered |
| Elective | 15231 Create and use a range of resources to effectively manage teams, sections, departments or divisions | Level 5 | 4 | Registered |
| Elective | 15234 Apply efficient time management to the work of a department/division/section | Level 5 | 4 | Registered |
| Fundamental | 9015 Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems | Level 4 | 6 | Reregistered |
| Fundamental | 7866 Plan, organise and monitor work in own area of responsibility | Level 5 | 3 | Reregistered |
| Fundamental | 8647 Apply workplace communication skills | Level 5 | 10 | Reregistered |
| Fundamental | 12432 Use mathematical and statistical techniques effectively | Level 5 | 20 | Registered |
| Fundamental | 12433 Use communication techniques effectively | Level 5 | 8 | Registered |
| Fundamental | 15225 Identify and interpret related legislation and its impact on the team, department or division and ensure compliance | Level 5 | 4 | Registered † |



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

1

Conduct dye penetrant testing

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|---|--------------------------------|--------------------|
| 119235 | Conduct dye penetrant testing | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 4 | Level 3 | Regular |

SPECIFIC OUTCOME 1

Set-up dye penetrant testing equipment.

SPECIFIC OUTCOME 2

Perform dye penetrant testing.

SPECIFIC OUTCOME 3

Record and classify the results of the tests.

SPECIFIC OUTCOME 4

Report the results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

2

Conduct magnetic particle testing

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119253 | | Conduct magnetic particle testing | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 4 | Level 3 | Regular |

SPECIFIC OUTCOME 1

Set-up magnetic particle testing equipment.

SPECIFIC OUTCOME 2

Perform magnetic particle testing.

SPECIFIC OUTCOME 3

Record and classify the results of the tests.

SPECIFIC OUTCOME 4

Report the results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

3

Conduct eddy current testing

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119245 | | Conduct eddy current testing | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 8 | Level 4 | Regular |

SPECIFIC OUTCOME 1

Set-up eddy current equipment.

SPECIFIC OUTCOME 2

Perform eddy current testing.

SPECIFIC OUTCOME 3

Record and classify the results of the tests.

SPECIFIC OUTCOME 4

Report the results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

4

Conduct magnetic particle inspection

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119232 | | Conduct magnetic particle inspection | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 6 | Level 4 | Regular |

SPECIFIC OUTCOME 1

Translate MT Codes, Specifications and Procedures into practical work instructions adapted to the actual working conditions.

SPECIFIC OUTCOME 2

Set up and verify equipment.

SPECIFIC OUTCOME 3

Perform and supervise testing.

SPECIFIC OUTCOME 4

Interpret and evaluate results.

SPECIFIC OUTCOME 5

Organise and report results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

5

Conduct radiographic testing

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119239 | | Conduct radiographic testing | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 8 | Level 4 | Regular |

SPECIFIC OUTCOME 1

Set-up radiographic testing equipment.

SPECIFIC OUTCOME 2

Perform radiographic testing.

SPECIFIC OUTCOME 3

Record and classify the results of the tests.

SPECIFIC OUTCOME 4

Report the results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

6

Conduct ultrasonic testing

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|---|--------------------------------|--------------------|
| 119243 | Conduct ultrasonic testing | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 8 | Level 4 | Regular |

SPECIFIC OUTCOME 1

Set-up ultrasonic testing equipment.

SPECIFIC OUTCOME 2

Perform ultrasonic testing.

SPECIFIC OUTCOME 3

Record and classify the results of the tests.

SPECIFIC OUTCOME 4

Report the results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

7

Inspect and test electrical circuits

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119256 | | Inspect and test electrical circuits | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 6 | Level 4 | Regular |

SPECIFIC OUTCOME 1

Read and interpret electric circuit diagrams.

SPECIFIC OUTCOME 2

Prepare the work area.

SPECIFIC OUTCOME 3

Inspect electrical circuits.

SPECIFIC OUTCOME 4

Test electrical circuits.

SPECIFIC OUTCOME 5

Complete work activities.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

8

Perform and evaluate liquid penetrant testing

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119237 | | Perform and evaluate liquid penetrant testing | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 6 | Level 4 | Regular |

SPECIFIC OUTCOME 1

Translate P.T. Codes, Specifications and Procedures into practical work instructions.

SPECIFIC OUTCOME 2

Verify the process and equipment.

SPECIFIC OUTCOME 3

Supervise and perform inspections.

SPECIFIC OUTCOME 4

Interpret and evaluate inspection results.

SPECIFIC OUTCOME 5

Organise and report results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

9

Produce and maintain work activity reports

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|--|--------------------------------|
| 119257 | | Produce and maintain work activity reports | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 8 | Level 4 | Regular |

SPECIFIC OUTCOME 1

Gather information for reports.

SPECIFIC OUTCOME 2

Write reports.

SPECIFIC OUTCOME 3

Maintain reports.

SPECIFIC OUTCOME 4

Distribute and follow-up on reports.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

10

Release entrapped passengers from immobile lift

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 13781 | | Release entrapped passengers from immobile lift | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular-Provider | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 4 | Level 4 | Regular-Provider |

SPECIFIC OUTCOME 1

Plan work activities.

SPECIFIC OUTCOME 2

Prepare work area.

SPECIFIC OUTCOME 3

Release entrapped passengers.

SPECIFIC OUTCOME 4

Complete work activities.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

11

Apply the ISO document "guide to the expression of uncertainty in measurement" to estimate uncertainty of measurement

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119255 | | Apply the ISO document "guide to the expression of uncertainty in measurement" to estimate uncertainty of measurement | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 5 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Define and explain the concepts and methodology of uncertainty of measurement.

SPECIFIC OUTCOME 2

Analyse the basic contributors to uncertainty of measurement.

SPECIFIC OUTCOME 3

Estimate the uncertainty of measurement.

SPECIFIC OUTCOME 4

Evaluate and record the estimate of uncertainty of measurement.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

12

Calibrate oscilloscopes

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|-------------------------|---|--------------------------------|
| 119248 | Calibrate oscilloscopes | | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 18 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Maintain oscilloscope calibration reference standards.

SPECIFIC OUTCOME 2

Calibrate oscilloscope display.

SPECIFIC OUTCOME 3

Calibrate oscilloscope vertical systems.

SPECIFIC OUTCOME 4

Calibrate oscilloscope horizontal systems.

SPECIFIC OUTCOME 5

Calibrate oscilloscope trigger systems.

SPECIFIC OUTCOME 6

Calibrate oscilloscope Z-axis system.

SPECIFIC OUTCOME 7

Calibrate oscilloscope X-Y system.

SPECIFIC OUTCOME 8

Record, evaluate and report results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

13

Conduct non-destructive eddy current testing

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|--|--------------------------------|
| 119250 | | Conduct non-destructive eddy current testing | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 12 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Translate ET Codes, Specifications and Procedures into practical work instructions adapted to the actual working conditions.

SPECIFIC OUTCOME 2

Set up and verify equipment for eddy current testing.

SPECIFIC OUTCOME 3

Perform and supervise testing.

SPECIFIC OUTCOME 4

Interpret and evaluate results.

SPECIFIC OUTCOME 5

Organize and report results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

14

Conduct non-destructive radiographic tests

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|--|--------------------------------|
| 119247 | | Conduct non-destructive radiographic tests | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 12 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Translate NDT procedures into practical testing instructions adapted to the actual working conditions.

SPECIFIC OUTCOME 2

Set up and verify equipment for radiography.

SPECIFIC OUTCOME 3

Perform and supervise testing.

SPECIFIC OUTCOME 4

Interpret and evaluate results.

SPECIFIC OUTCOME 5

Organise and report results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

15

Conduct non-destructive ultrasonic testing

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|--|--------------------------------|--------------------|
| 119252 | Conduct non-destructive ultrasonic testing | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 12 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Translate UT Codes, Specifications and Procedures into practical work instructions adapted to the actual working conditions.

SPECIFIC OUTCOME 2

Set-up and verify equipment for ultrasonic testing.

SPECIFIC OUTCOME 3

Perform and supervise testing.

SPECIFIC OUTCOME 4

Interpret and evaluate results.

SPECIFIC OUTCOME 5

Organise and report results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

16

Define the role, functions and operation of the international measurement system

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|--|--------------------------------|--------------------|
| 119238 | Define the role, functions and operation of the international measurement system | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 1 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Define the structure, role and function of the international measurement system.

SPECIFIC OUTCOME 2

Explain the derivation of accuracy traceability from SI units.

SPECIFIC OUTCOME 3

Explain the relationship between the international measurement system and quality systems.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

17

Develop calibration and test methods and procedures

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119241 | | Develop calibration and test methods and procedures | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 3 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Define and explain the need for measurement methods/procedures.

SPECIFIC OUTCOME 2

Develop a basic measurement procedure.

SPECIFIC OUTCOME 3

Validate the measurement method.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

18

Establish and manage a test/calibration laboratory

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|--|--------------------------------|--------------------|
| 119242 | Establish and manage a test/calibration laboratory | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 7 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Define, clarify and explain the concepts of strategic management, financial management and business planning.

SPECIFIC OUTCOME 2

Generate a business plan for the successful establishment of a selected test/calibration laboratory.

SPECIFIC OUTCOME 3

Evaluate the feasibility of the business plan for the successful establishment of a selected test/calibration laboratory.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

19

Implement a quality system to ensure technically valid measurement results in accordance with ISO/IEC 17025

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|---|--------------------------------|--------------------|
| 119244 | Implement a quality system to ensure technically valid measurement results in accordance with ISO/IEC 17025 | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 6 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Explain why a Quality System is required to ensure technically valid measurement results.

SPECIFIC OUTCOME 2

Describe and clarify the management and technical requirements for a measurement quality system.

SPECIFIC OUTCOME 3

Develop a measurement quality system for a given specific laboratory environment.

SPECIFIC OUTCOME 4

Apply various assessment methods to evaluate the effectiveness of the implemented measurement quality system.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

20

Inspect and test escalator and passenger conveyor equipment

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|---|--------------------------------|--------------------|
| 119246 | Inspect and test escalator and passenger conveyor equipment | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 12 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Plan work activities.

SPECIFIC OUTCOME 2

Prepare work area.

SPECIFIC OUTCOME 3

Inspect and test escalator and passenger conveyor equipment.

SPECIFIC OUTCOME 4

Complete work activities.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

21

Inspect and test lift car and counterweight equipment

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119249 | | Inspect and test lift car and counterweight equipment | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 5 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Plan work activities.

SPECIFIC OUTCOME 2

Prepare work area.

SPECIFIC OUTCOME 3

Inspect and test lift car and counterweight equipment.

SPECIFIC OUTCOME 4

Complete work activities.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

22

Inspect and test lift machine room equipment

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|--|--------------------------------|--------------------|
| 119268 | Inspect and test lift machine room equipment | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 15 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Plan work activities.

SPECIFIC OUTCOME 2

Prepare work area.

SPECIFIC OUTCOME 3

Inspect and test lift machine room equipment.

SPECIFIC OUTCOME 4

Complete work activities.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

23

Inspect and test lift pit equipment

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119270 | | Inspect and test lift pit equipment | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 3 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Plan work activities.

SPECIFIC OUTCOME 2

Prepare work area.

SPECIFIC OUTCOME 3

Inspect and test lift pit equipment.

SPECIFIC OUTCOME 4

Complete work activities.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

24

Inspect and test lift well equipment

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|---|--------------------------------|--------------------|
| 119269 | Inspect and test lift well equipment | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 5 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Plan work activities.

SPECIFIC OUTCOME 2

Prepare work area.

SPECIFIC OUTCOME 3

Inspect and test lift well equipment.

SPECIFIC OUTCOME 4

Complete work activities.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

25

Measure frequency using frequency counters.

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119251 | | Measure frequency using frequency counters. | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 3 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Understand the fundamentals of frequency measurement.

SPECIFIC OUTCOME 2

Measure frequency using a reference frequency counter.

SPECIFIC OUTCOME 3

Record and evaluate results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

26

Perform AC electrical and AC/DC transfer measurements and calibrate devices

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|---|--------------------------------|--------------------|
| 119240 | Perform AC electrical and AC/DC transfer measurements and calibrate devices | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 17 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Maintain AC Electrical and AC/DC Transfer reference standards.

SPECIFIC OUTCOME 2

Derive, generate and measure AC Electrical and AC/DC Transfer quantities and calibrate devices.

SPECIFIC OUTCOME 3

Record, evaluate and report results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

27

Perform AC power and energy measurements and calibrate devices

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|--|--------------------------------|
| 119258 | | Perform AC power and energy measurements and calibrate devices | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 12 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Maintain AC Power and Energy reference standards.

SPECIFIC OUTCOME 2

Derive, generate and measure AC Power and Energy quantities and calibrate devices.

SPECIFIC OUTCOME 3

Record, evaluate and report results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

28

Perform DC electrical and resistance measurements and calibrate devices.

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|--|---|--------------------------------|
| 119254 | Perform DC electrical and resistance measurements and calibrate devices. | | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 17 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Maintain DC electrical and Resistance reference standards.

SPECIFIC OUTCOME 2

Derive, generate and measure DC electrical and Resistance quantities and calibrate electrical devices.

SPECIFIC OUTCOME 3

Record, evaluate and report results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

29

Perform impedance measurements and calibrate devices

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|--|--------------------------------|
| 119233 | | Perform impedance measurements and calibrate devices | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 12 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Maintain Impedance reference standards.

SPECIFIC OUTCOME 2

Derive, generate and measure Impedance quantities and calibrate devices.

SPECIFIC OUTCOME 3

Record, evaluate and report results.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

30

Perform temperature measurements using secondary temperature standards

| SAQA US ID | UNIT STANDARD TITLE | | |
|--------------------|--|--------------------------------|--------------------|
| 119234 | Perform temperature measurements using secondary temperature standards | | |
| SGB NAME | NSB 06 | PROVIDER NAME | |
| SGB Engineering | Manufacturing, Engineering and Technology | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Manufacturing, Engineering and Technology | Engineering and Related Design | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 6 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Understand the fundamentals of temperature.

SPECIFIC OUTCOME 2

Measure temperature using laboratory reference thermometer.

SPECIFIC OUTCOME 3

Record and evaluate results.

SPECIFIC OUTCOME 4

Apply corrections for temperature to metrological quantities measured, when required.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

31

Report measurement results

| SAQA US ID | | UNIT STANDARD TITLE | |
|--------------------|---------|---|--------------------------------|
| 119236 | | Report measurement results | |
| SGB NAME | | NSB 06 | PROVIDER NAME |
| SGB Engineering | | Manufacturing, Engineering and Technology | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Manufacturing, Engineering and Technology | Engineering and Related Design |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 3 | Level 5 | Regular |

SPECIFIC OUTCOME 1

Identify the needs for measurement reports/certificates.

SPECIFIC OUTCOME 2

Interpret the requirements for measurement reports/certificates.

SPECIFIC OUTCOME 3

Generate a measurement report/certificate.

No. 198

11 March 2005



Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

In accordance with regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Occupational Directed Practitioners

Registered by NSB 05, Education, Training and Development, publishes the following qualifications and unit standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the qualification and unit standards upon which qualifications are based. The full qualification and unit standards can be accessed via the SAQA web-site at www.saga.org.za. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, 1067 Arcadia Street, Hatfield Forum West, Hatfield, Pretoria.

Comment on the unit standards should reach SAQA at the address ***below and no later than 11 April 2005***. All correspondence should be marked **Standards Setting – SGB for Occupational Directed**, and addressed to

The Director: Standards Setting and Development
SAQA

Attention: Mr. E. Brown

Postnet Suite 248

Private Bag X06

Waterkloof

0145

or faxed to 012 – 431-5144

ebrown@saga.co.za


DUGMORE MPHUTHING

ACTING DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

Further Education and Training Certificate: Inclusive Learning

| SAQA QUAL ID | QUALIFICATION TITLE | | |
|---|--|----------------|-------------------------|
| 49531 | Further Education and Training Certificate: Inclusive Learning | | |
| SGB NAME | NSB 05 | PROVIDER NAME | |
| SGB Occupationally-directed ETD Practitioners | Education, Training and Development | | |
| QUAL TYPE | FIELD | SUBFIELD | |
| National Certificate | Education, Training and Development | Adult Learning | |
| ABET BAND | MINIMUM CREDITS | NQF LEVEL | QUALIFICATION CLASS |
| Undefined | 146 | Level 4 | Regular-Unit Stds Based |

PURPOSE AND RATIONALE OF THE QUALIFICATION

The purpose of the Qualification is to ensure that practitioners are able to function effectively in inclusive settings. Qualified learners are expected to manage residential, employment and/or learning sites in inclusive settings, be able to work in multi-disciplinary teams to support other professionals, and support individuals or groups learning and working in inclusive settings.

Qualified learners are capable of:

- > Communicating in a variety of ways in any two languages
- > Using mathematics in practical applications within inclusive settings
- > Gathering information regarding inclusive settings and inclusion
- > Selecting individual and group activities for social, recreational, academic and physical inclusion
- > Delivering and supporting professional services in inclusive settings to provide optimal care
- > Supporting individuals and groups learning and living in inclusive settings to participate in activities
- > Managing administration in inclusive settings according to specific requirements
- > Advocating human rights and inclusion within specific communities
- > Creating healthy, safe and secure inclusive settings that ensure the protection of individuals and groups

To qualify, learners are required to achieve at least one of the following outcomes, namely, to be capable of:

- > Managing residential, employment and/or learning sites OR
- > Facilitating curriculum access for learners

Rationale:

New legislation regarding inclusive education requires that practitioners be able to deliver appropriate services in inclusive settings. Inclusive education acknowledges that all people can learn and respects their differences; it enables structures, systems and methodologies for learning to meet the needs of all; it is part of a wider strategy to promote an inclusive society; and it is a dynamic process which is constantly evolving. The intention with the registration of this Qualification is to build the capacity of practitioners in inclusive settings, as no Qualification exists at this level for entry into the field of inclusive learning. Furthermore, the existence of a national Qualification is aimed at improving the consistency of programmes and assessments.

The Qualification is aimed at persons responsible for residential facilities (these practitioners are historically referred to as housemothers or -parents) for children and adults experiencing intrinsic or extrinsic barriers to learning and employment, as well as support/auxiliary workers such as caregivers and classroom assistants, who are responsible for facilitating learning and providing support in inclusive settings. In addition, specific Unit Standards included in the Qualification are aimed at other professionals who work in inclusive settings, such as equity officers, orientation and mobility practitioners, helping professionals (including health care workers, psychologists, doctors, occupational therapists, etc.), Early Childhood Development practitioners,

Adult Basic Education and Training practitioners, Development practitioners, trainers, educators in General, Further and Higher Education and Training institutions, sign language interpreters, librarians, child minders, au pairs, reformatory workers, prison care centre personnel, personnel in places of safety, etc.

Qualified practitioners are able to provide the appropriate level of support, adaptation and modification of delivery for learners. They are able to facilitate development in an inclusive setting according to the needs of learners who are experiencing barriers to learning, to ensure equal access to outcomes based learning opportunities. Qualified practitioners should be flexible and responsive in their delivery.

This Qualification provides recognition for practitioners' working experience, and allows for the achievement of a Qualification. The Qualification provides them with opportunities to progress and access education, training and development practice Qualifications at NQF Level 5. The Qualification was designed to facilitate promotion life-long learning, and access to Higher Education and Training, and articulates with Qualifications in other disciplines, such as ancillary health care. In addition, various professionals, such as health care workers, psychologists, doctors, and occupational therapists, require areas of competence included in the Unit Standards of this Qualification to ensure inclusion.

Empowerment of practitioners will lead to the empowerment of learners. Competent implementation of inclusive education will create jobs for practitioners and improve employment and social participation opportunities for those learners who are experiencing barriers to learning and employment. By creating a body of knowledge regarding inclusion, a national asset is harnessed. The Qualification may improve financial status of practitioners, add national economic value through qualified professionals and improve learners' economic participation and opportunities.

RECOGNIZE PREVIOUS LEARNING?

N

LEARNING ASSUMED TO BE IN PLACE

Learners are assumed to be competent in Communication and Mathematical Literacy at NQF Level 3.

Recognition of prior learning (RPL)

This qualification can be achieved wholly, or in part, through recognition of prior learning. Evidence can be presented in a variety of forms, including previous international or local qualifications, reports, testimonials, mentoring, functions performed, portfolios, work records and performance records. As such, evidence should be judged according to the general principles of assessment described in the notes to assessors below. Learners who have met the requirements of any Unit Standard that forms part of this qualification may apply for recognition of prior learning to the relevant Education and Training Quality Assurance body (ETQA). The applicant must be assessed against the specific outcomes and with the assessment criteria for the relevant Unit Standards. A qualification will be awarded should a learner demonstrate that the exit level outcomes of the qualification have been attained.

QUALIFICATION RULES

All the Fundamental Component Unit Standards are compulsory (56 credits).

All the Core Component Unit Standards are compulsory (70 credits).

For the Elective Component learners are required to attain at least 20 credits out of 211 credits, to ensure that at least one of the Elective component exit level outcomes is achieved.

EXIT LEVEL OUTCOMES

Fundamental and Core

1. Gather information regarding inclusive settings and inclusion
2. Support individuals and groups learning and living in inclusive settings for social, recreational, academic and physical inclusion
3. Deliver and support professional services in inclusive settings to provide optimal care and carry out lawful instructions

Range: Professional services may include education, management, health services, supervision, etc.

4. Manage administration in inclusive settings according to specific requirements

Range: Administration may include organisation of and running meetings, site maintenance, household management, keeping attendance registers, purchasing and stock control, equipment maintenance, completion of relevant forms, report writing, correspondence, duty sheet compilation and completion, etc.

5. Create healthy, safe and secure inclusive settings that ensure the protection of individuals and groups
6. Advocate human rights and inclusion within specific communities

Elective (achievement of one outcome is required to qualify)

7. Manage residential, employment and/or learning sites to ensure optimal functioning or Support curriculum access in inclusive settings or Facilitate learning events in inclusive settings to promote learning and general well-being.

Range: learning events can be aimed at any one age group, and for any one purpose.

ASSOCIATED ASSESSMENT CRITERIA

Fundamental and Core

1.
 - > Criteria developed for selecting relevant information are justified in terms of specific context requirements.
 - > Relevant sources are summarised using agreed conventions.
 - > All information and quotations taken from sources are acknowledged and checks are made to ensure that no copyright laws have been infringed

2.
 - > Support strategy efficacy is assessed against specified requirements. Range: Support can include amenities that are fit for purpose; specific requirements includes consultation with relevant stakeholders, and identification and interpretation of the level of individual and group needs for participation in activities based on observed and documented information about specific individual and group needs
 - > Progress reports are written in accordance with specified requirements.
 - > Activities are planned and presented to meet the requirements for inclusion and are appropriate for both group and individual needs, and varying contexts and environments.

Range: Activities may include workplace, sport, learning, recreational, leisure, etc. activities; requirements for inclusion can be based on constitutional principles, such as human rights, access and participation, and can include accommodating diverse needs, appropriate activities.

3.
 - > Assessment and reporting of individual progress as well as events and incidents of significance are recorded in writing.
 - > Events and incidents of significance are communicated using specified formats.
 - > Collaboration and consultation are applied according to agreed principles
 - > Responsibilities as a team member are explained according to agreed principles of collaboration and consultation.
 - > Self evaluation, reflection and seeking assistance are justified in terms of own strengths, weaknesses and capabilities.

4.
 - > All required administrative procedures, tasks and activities are performed as required within specific contexts, and within specified deadlines and time frames.

Range: administration includes procurement, financial transacting and recording; required procedures can be developed by the learner

 - > Legal procedures are explained as they pertain to inclusive education.
 - > Financial transacting and recording are executed according to legal requirements.

5.
 - > The application of First Aid is provided within given limitations of scope and assistance.
 - > The administration of medication is applied according to specified and regulatory requirements.
 - > Medical procedures and illnesses are explained as they apply to given limitations of scope and assistance
 - > Crisis identification and management are applied within given scope of responsibilities.
 - > Suspected criminal activities are reported to relevant persons

Range: criminal activities may include abuse, corruption, etc.

6.
 - > Content of advocacy is justified in terms of specified health needs.
 - > Legislation, policies, and regulations are explained in terms of relevance to inclusive education
 - > Advocacy is justified in terms of specific needs and focus is on individual strengths, requirements for mutual respect and acceptance within specific contexts

Elective (achievement of one outcome is required to qualify)

7.

> Procedures for the management of learning/residential environments are explained in terms of specified requirements

Range: Requirements include hygiene, legal/regulatory, policy, health (including nutritional) and physical infrastructure maintenance requirements

> Activities are planned and presented as they apply to specific contexts

> Legislation, policies and regulations are interpreted as they relate to inclusive education

> Strategies for the generation of resources are explained to determine if they are feasible for specific contexts

> Responses to diverse learning needs are justified for specific learning needs

Range: Responses can include Mediation of implementation of selected learning support materials

> Educational/training concepts and principles are described in terms of their relevance to specific contexts
Range: principles may include principle of Outcomes Based Education, assessment, levels of support, adaptations, modifications, assistive technology, etc.

> The implementation of differentiated approaches are explained in terms of specific contexts.

> Planning, content, materials and facilitation are explained in terms of their effectiveness and appropriateness in terms of specific criteria

Range: Criteria include specific target group characteristics and needs

> Reporting of learning events is explained in terms of specified requirements

> Preparation and presentation of assessment evidence is explained in terms of given requirements

Assessment criteria

The assessment criteria in the unit standards are performance-based, assessing applied competence of Braille practitioners, rather than only underpinning knowledge, or only skills. The critical cross-field outcomes are also achieved in the unit standards. In addition to the competence assessed to achieve the unit standards, learners must demonstrate that they can achieve the outcomes in an integrated manner, dealing effectively with different and random demands related to Braille practitioner occupational and learning contexts, to qualify, and assessment approaches used should be appropriate for assessing applied competence of Braille practitioners. Integrated assessment is meaningful if there are clear relationships between the purpose statement, exit level outcomes and integrated assessment of this qualification.

Learners who qualify must be able to integrate concepts, ideas and behaviours across unit standards to achieve the purpose of the qualification. Evidence (as specified in the associated assessment criteria) is required that the learner is able to achieve the exit level outcomes of the qualification as a whole and in an integrated way, and thus its purpose, at the time of the award of the qualification.

Evidence of integration may be presented by learners when being assessed against the unit standards, and separate assessment for integration may not be necessary. Workplace experience can be recognised when assessing towards this qualification. Integrated assessment should include observable performance as well as the quality of thinking behind such performance. Formative assessment can be employed during learning towards the unit standards and during integration to achieve exit level outcomes, to ensure that integration takes place when summative assessment is employed.

INTERNATIONAL COMPARABILITY

Internationally, most education and training for the facilitation of learning in inclusive settings is limited to qualified teacher/educator education and training. In Africa, inclusive education policies in South Africa and Uganda are considered exemplary, even by international standards.

In African countries such as Rwanda, Kenya, Swaziland, Zambia, Ethiopia and Lesotho, training for inclusion is mostly limited to teacher training, at higher levels than this South African qualification. Such teacher training, usually in the form of short courses, includes peer support, classroom management, adapting the curriculum, group work, encouraging family support, and promoting positive attitudes. Most other initiatives make use of community development and participation, without formal training at the community level. Other countries with similar approaches include Yemen, Macedonia, Pakistan, Bangladesh, India, Iran, Vietnam, Papua New Guinea, Thailand, Brazil, Cambodia, Cameroon, Mongolia, Nepal, Afghanistan, and Romania. Uganda has similar inclusive education policies to that of South Africa, but also limits training to higher levels, and mostly for qualified teachers.

In India, the approach to inclusion has been integration within schools. General teachers learn to:

- > Establish a baseline of existing levels of competence
- > Plan long and short-term educational interventions
- > Manage the classroom
- > Understand child focused learning
- > Facilitate learning

- > Manage classrooms
- > Develop curriculum-based, criterion-referenced materials for assessment, identification, planning, implementation and evaluation
- > Develop learning materials, including facilitator guides
- > Prepare monitoring tools, that also allow parent participation
- > Enhance communication skills
- > Enhance self image

They also learn life skills. These competencies are at a level above that of this South African qualification.

In Israel, on-the-job training is provided to residential educators and care workers and, not unlike the South African qualification, is aimed at providing access to education careers at higher levels of training. As with the South African qualification, training addresses residential care as well as education competence. Although the Israeli programs run over five years, the learning time is equivalent to that of this South African qualification. Areas addressed in the programs include youth at risk, information education and care, educational sociology, developmental psychology, quantitative research methods, group dynamics and communication and interviewing.

In the United States of America, equivalent competence is required of individualised personal services or home management services. Training is mostly on-the-job, and addresses mostly personal care competence to facilitate independent living, implement procedures regarding protective equipment and decontamination, doing laundry, ensuring waste removal, ensuring personal hygiene, cleaning and care of equipment, assistance with adaptive technology, skin care and bathing, dressing and grooming, facilitating motion exercises, transfers, house care and domestic management, meal preparation and food safety, and meeting the needs and preferences of the person with a disability. Community worker training is differentiated and includes collaboration, funding, building responsibility and leadership, family and peer support, supportive services and opportunities, career awareness, planning and readiness, and work and learning. Most other training regarding inclusion is provided to qualified teachers.

In the United Kingdom, equivalent programs include the following core areas of competence:

- > Contribute to the management of learner behaviour
- > Establish and maintain relationships with individual learners and groups
- > Support learners during learning activities
- > Review and develop own professional practice

The elective component includes six competence areas, with one from each of the following sets, and any other two areas:

- > Set A: Assist in preparing and maintaining the learning environment; Contribute to maintaining learner records; Observe and report on learner performance; Contribute to the planning and evaluation of learning activities
 - > Set B: Promote learner's social and emotional development; Support the maintenance of learner safety and security; Contribute to the health and well-being of learners; Provide support for bilingual/multilingual learners; Support learners with communication and interaction difficulties; Support learners with cognition and learning difficulties; Support learners with behavioural, emotional and social development needs; Provide support for learners with sensory and/or physical impairment
 - > Set C: Support the use of ICT in the classroom; Help learners to develop their literacy skills; Help learners to develop their numeracy skills; Help learners to access the curriculum
 - > Set D: Support the development and effectiveness of work teams; Develop and maintain working relationships with other professionals; Liaise effectively with parents
- Assisting learners in terms of specific learning areas (e.g. literacy, numeracy, etc.) are not included in the South African qualification. In Scotland, programs for residential care givers focus on safety, principles and concepts, managing challenging behaviour, sexual abuse work, through care and after care, and parental involvement. These programs are shorter than the South African qualification, consisting of approximately 30 credits.

On the Australia framework, equivalent competence forms part of a Certificate in Education for teacher aides. The core component includes:

- > Develop and apply knowledge and understanding of school sector issues
- > Contribute to equitable and inclusive education
- > Use the advanced functions of a range of equipment to complete daily tasks
- > Assist with student supervision and behaviour management
- > Support students with additional needs in the classroom
- > Produce business documents

The elective component includes:

- > Support students learning in a particular learning area
- > Support reading development
- > Support writing development
- > Support oral language development
- > Support students' literature usage
- > Support numeracy development
- > Support the physical development of students
- > Develop and apply knowledge of Tasmanian Aboriginal societies
- > Provide care and support for students with disabilities; support students with a special need
- > Work with young children
- > Provide care and support for students with severe physical disabilities
- > Support students with a communication disability
- > Perform basic first aid in an education environment

Components not reflected in this South African qualification are those relating to supporting reading, writing, oral language development, literature usage, and numeracy development.

The New Zealand framework credits competence at an equivalent level, however, with fewer credits and not as a qualification, for the following units:

- > Developing a plan of personal support networks
- > Knowledge of conductive education and conductive education in New Zealand
- > Assisting conductors during the conductive education programme
- > Assisting conductors to prepare conductive education programmes
- > Knowledge of the way conductive education works to establish orthofunction
- > Assisting clients with self care in conductive education
- > Participating in the implementation of individual learning plans for young people with special needs
- > Assist with implementation of early intervention programmes
- > Assist with implementation of various specific programmes (e.g. develop reading skills, deaf or hearing impaired persons, oral language difficulties, vision impaired persons, etc.)
- > Provide language assistance in education settings to young people who are deaf, and taking notes for young people who are deaf
- > Identify and apply ethical guidelines for working with young people who have special education needs
- > Describe and support a collaborative consultative team approach for young people with special needs

ARTICULATION OPTIONS

Vertical articulation on the NQF is possible with the National Diploma: Inclusive Education (NQF Level 5), as well as the National Diploma: Braille Practice (NQF Level 5), and the National Diploma: Orientation and Mobility Practice (NQF Level 5).

Horizontal articulation on the NQF is possible with all Further Education and Training Certificates through the Fundamental component (communication and language and mathematic literacy), as well as the National Certificate: Project Management (NQF Level 4), Certificate: Small Business Financial Management (NQF Level 4), Certificate: Professional Cookery (NQF Level 4), National Certificate: Generic Management (NQF Level 4), Further Education and Training Certificate: Community Health Work (NQF Level 4) and the Certificate: Occupation-Directed Education, Training and Development (ETD) Practice (NQF Level 4).

MODERATION OPTIONS

Moderation of assessment and accreditation of providers shall be at the discretion of a relevant ETQA as long as it complies with the SAQA requirements. The ETQA is responsible for moderation of learner achievements of learners who meet the requirements of this qualification. Particular moderation and accreditation requirements are:

- > Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA. Providers offering learning towards achievement of any of the unit standards that make up this qualification must also be accredited through the relevant ETQA accredited by SAQA.
- > The ETQA will oversee assessment and moderation of assessment according to their policies and guidelines for assessment and moderation, or in terms of agreements reached around assessment and moderation between the relevant ETQA and other ETQAs and in terms of the moderation guideline detailed here.
- > Moderation must include both internal and external moderation of assessments for the qualification, unless the relevant ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described in Unit Standards as well as the integrated competence described in the qualification.

- > Internal moderation of assessment must take place at the point of assessment with external moderation provided by a relevant ETQA according to the moderation guidelines and the agreed ETQA procedures.
- > Anyone wishing to be assessed against this qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessment of learner achievements takes place at providers accredited by the relevant ETQA (RSA, 1998b) for the provision of programs that result in the outcomes specified for this qualification. Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the ETQA. Assessors registered with the relevant ETQA must carry out the assessment of learners for the qualification and any of the Unit Standards that make up this qualification.

To register as an assessor, the following are required:

- > Detailed documentary proof of relevant qualification/s, practical training completed, and experience gained at a NQF level above the level of this qualification
- > NQF recognised assessor credit

Assessors should keep the following general principles in mind when designing and conducting assessments:

- > Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the Unit Standards to ensure assessment is integrated rather than fragmented. Remember that the learner needs to be declared competent in terms of the qualification purpose and exit level outcomes.
- > Where assessment across Unit Standard titles or at Unit Standard title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
- > Make sure evidence is gathered across the entire range, wherever it applies.

In particular, assessors should assess that the learner demonstrates an ability to consider a range of options by:

- > Measuring the quality of the observed practical performance as well as the theory and underpinning knowledge.
- > Using methods that are varied to allow the learner to display thinking and decision making in the demonstration of practical performance.
- > Maintaining a balance between practical performance and theoretical assessment methods to ensure each is measured in accordance with the level of the qualification.
- > Taking into account that the relationship between practical and theoretical components is not fixed, but varies according to the type and level of qualification.

All assessments should be conducted in line with the following well-documented principles:

- > Appropriate: The method of assessment is suited to the performance being assessed.
- > Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence.
- > Manage: The methods used make for easily arranged cost-effective assessments that do not unduly interfere with learning.
- > Integrate into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.
- > Valid: The assessment focuses on the requirements laid down in the standards; i.e. the assessment is fit for purpose.
- > Direct: The activities in the assessment mirror the conditions of actual performance as close as possible.
- > Authentic: The assessor is satisfied that the work being assessed is attributable to the learner being assessed.
- > Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
- > Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.
- > Open: Learners can contribute to the planning and accumulation of evidence. Learners for assessment understand the assessment process and the criteria that apply.
- > Consistent: The same assessor would make the same judgement again in similar circumstances. The judgement made is similar than the judgement that would be made by other assessors

NOTES

UNIT STANDARDS*(Note: A blank space after this line means that the qualification is not based on Unit Standards.)*

| | UNIT STANDARD ID AND TITLE | LEVEL | CREDITS | STATUS |
|-------------|---|---------|---------|----------------------------|
| Core | 14048 Apply Self Management Concepts | Level 4 | 3 | Registered |
| Core | 110009 Manage administration records | Level 4 | 4 | Registered |
| Core | 110057 Conduct a self-evaluation of own progress and development | Level 4 | 2 | Registered |
| Core | 114589 Manage time productively | Level 4 | 4 | Registered |
| Core | 117185 Participate in a developmental assessment | Level 4 | 8 | Registered |
| Core | 117865 Assist and support learners to manage their learning experiences | Level 4 | 5 | Recommended |
| Core | 117870 Conduct targeted training and development using given methodologies | Level 4 | 10 | Recommended |
| Core | 119272 Identify levels of support needed for inclusion | Level 4 | 13 | Draft - Prep for P Comment |
| Core | 119273 Assist in creating an inclusive environment | Level 4 | 4 | Draft - Prep for P Comment |
| Core | 119274 Select learning support materials and assistive technology for inclusive settings | Level 4 | 12 | Draft - Prep for P Comment |
| Elective | 7637 Maintain hygiene in food preparation, cooking and storage | Level 3 | 2 | Reregistered |
| Elective | 10956 Provide commuter services | Level 3 | 8 | Reregistered |
| Elective | 7390 Identify and respond to learners who have special needs | Level 4 | 8 | Reregistered |
| Elective | 10134 Participate in the estimation and preparation of cost budgets for an element of work and monitor and control actual cost against budget | Level 4 | 6 | Reregistered |
| Elective | 10142 Fulfill procurement activities and supervise procurement administration | Level 4 | 8 | Reregistered |
| Elective | 10231 Plan a learning event | Level 4 | 8 | Reregistered |
| Elective | 12544 Facilitate the preparation and presentation of evidence for assessment | Level 4 | 4 | Registered |
| Elective | 13947 Motivate a team | Level 4 | 6 | Registered |
| Elective | 14667 Describe and apply the management functions of an organization | Level 4 | 10 | Registered |
| Elective | 109999 Manage service providers in a selected organisation | Level 4 | 5 | Registered |
| Elective | 110003 Develop administrative procedures in a selected organisation | Level 4 | 8 | Registered |
| Elective | 110054 Select and use learning support materials in development practice | Level 4 | 8 | Registered |
| Elective | 114483 Identify and apply strategies to deal with risk behaviour to promote psychological health and wellness | Level 4 | 6 | Registered |
| Elective | 114736 Record business financial transactions | Level 4 | 5 | Registered |
| Elective | 114738 Perform financial planning and control functions for a small business | Level 4 | 6 | Registered |
| Elective | 114740 Manage working capital | Level 4 | 5 | Registered |
| Elective | 115209 Participate in the development of a strategic plan for fundraising | Level 4 | 12 | Registered |
| Elective | 117173 Observe, record and report as an auxiliary child and youth care worker in child and youth care work context | Level 4 | 5 | Registered |
| Elective | 117189 Describe the use of relationships for developmental and therapeutic ends in child and youth care work | Level 4 | 8 | Registered |
| Elective | 117488 Plan and implement home based care | Level 4 | 6 | Registered |
| Elective | 117491 Produce accounting reports | Level 4 | 10 | Registered |
| Elective | 117492 Record and process workplace transactions | Level 4 | 10 | Registered |
| Elective | 117505 Educate and support parents in childcare | Level 4 | 12 | Registered |
| Elective | 119271 Support curriculum access for inclusive learning | Level 4 | 10 | Draft - Prep for P Comment |
| Elective | 7348 Structure a banking-related property finance solution to meet a business need | Level 5 | 16 | Reregistered |
| Elective | 7884 Control and order stock | Level 5 | 4 | Reregistered |
| Elective | 10214 Promote an awareness of nutritional principles | Level 5 | 6 | Registered |
| Elective | 15094 Demonstrate insight into the application of theories of Emotional and Spiritual Intelligence in personal development | Level 5 | 5 | Registered |
| Fundamental | 8968 Accommodate audience and context needs in oral communication | Level 3 | 5 | Reregistered |
| Fundamental | 8969 Interpret and use information from texts | Level 3 | 5 | Reregistered |
| Fundamental | 8970 Write texts for a range of communicative contexts | Level 3 | 5 | Reregistered |
| Fundamental | 8973 Use language and communication in occupational learning programmes | Level 3 | 5 | Reregistered |
| Fundamental | 7468 Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues | Level 4 | 6 | Reregistered |

| | | | | |
|-------------|--|---------|---|--------------|
| Fundamental | 8974 Engage in sustained oral communication and evaluate spoken texts | Level 4 | 5 | Reregistered |
| Fundamental | 8975 Read analyse and respond to a variety of texts | Level 4 | 5 | Reregistered |
| Fundamental | 8976 Write for a wide range of contexts | Level 4 | 5 | Reregistered |
| Fundamental | 9015 Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems | Level 4 | 6 | Reregistered |
| Fundamental | 9016 Represent analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts | Level 4 | 4 | Reregistered |
| Fundamental | 12153 Use the writing process to compose texts required in the business environment | Level 4 | 5 | Registered |
| Fundamental | 15096 Demonstrate an understanding of stress in order to apply strategies to achieve optimal stress levels in personal and work situations | Level 5 | 5 | Registered |



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

1

Assist in creating an inclusive environment

| SAQA US ID | UNIT STANDARD TITLE | | |
|---|---|----------------------|--------------------|
| 119273 | Assist in creating an inclusive environment | | |
| SGB NAME | NSB 05 | PROVIDER NAME | |
| SGB Occupationally-directed ETD Practitioners | Education, Training and Development | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Education, Training and Development | Adult Learning | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 4 | Level 4 | Regular |

SPECIFIC OUTCOME 1

Assess physical accessibility within an inclusive environment.

SPECIFIC OUTCOME 2

Ensure learning environment health and safety.

SPECIFIC OUTCOME 3

Collaborate and communicate with support services in specific inclusive environments.

SPECIFIC OUTCOME 4

Define own role in the provisioning of support.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

2

Identify levels of support needed for inclusion

| SAQA US ID | | UNIT STANDARD TITLE | |
|---|---------|---|----------------------|
| 119272 | | Identify levels of support needed for inclusion | |
| SGB NAME | | NSB 05 | PROVIDER NAME |
| SGB Occupationally-directed ETD Practitioners | | Education, Training and Development | |
| UNIT STANDARD TYPE | | FIELD DESCRIPTION | SUBFIELD DESCRIPTION |
| Regular | | Education, Training and Development | Adult Learning |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 13 | Level 4 | Regular |

SPECIFIC OUTCOME 1

Identify and describe factors that contribute to inclusion in education.

SPECIFIC OUTCOME 2

Identify learning needs within an inclusive education system.

SPECIFIC OUTCOME 3

Identify support structures available to specific learning sites.

SPECIFIC OUTCOME 4

Describe strategies and procedures for inclusion support.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

3

Select learning support materials and assistive technology for inclusive settings

| SAQA US ID | UNIT STANDARD TITLE | | |
|---|---|----------------------|--------------------|
| 119274 | Select learning support materials and assistive technology for inclusive settings | | |
| SGB NAME | NSB 05 | PROVIDER NAME | |
| SGB Occupationally-directed ETD Practitioners | Education, Training and Development | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Education, Training and Development | Adult Learning | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 12 | Level 4 | Regular |

SPECIFIC OUTCOME 1

Describe learning support materials and assistive technology needs for specific contexts.

SPECIFIC OUTCOME 2

Explain how specific learning materials and assistive technology enhance learning and learner independence.

SPECIFIC OUTCOME 3

Select learning support materials and assistive technology appropriate for specific needs.

SPECIFIC OUTCOME 4

Demonstrate the use of assistive technology to relevant persons.

SPECIFIC OUTCOME 5

Enhance learning facilitation using learning support materials.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

4

Support curriculum access for inclusive learning

| SAQA US ID | UNIT STANDARD TITLE | | |
|---|--|----------------------|--------------------|
| 119271 | Support curriculum access for inclusive learning | | |
| SGB NAME | NSB 05 | PROVIDER NAME | |
| SGB Occupationally-directed ETD Practitioners | Education, Training and Development | | |
| UNIT STANDARD TYPE | FIELD DESCRIPTION | SUBFIELD DESCRIPTION | |
| Regular | Education, Training and Development | Adult Learning | |
| ABET BAND | CREDITS | NQF LEVEL | UNIT STANDARD TYPE |
| Undefined | 10 | Level 4 | Regular |

SPECIFIC OUTCOME 1

Motivate for curriculum access based on relevant legislation and policies.

SPECIFIC OUTCOME 2

Suggest means for curriculum access using information from relevant national curriculum statements and assessment policies.

SPECIFIC OUTCOME 3

Respond to diverse learning needs.

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