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Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

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

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 qualification. The qualification can be accessed via the SAQA web site at **www.saqa.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 15 Aug 2005.* All correspondence should be marked **Standards Setting – SGB Engineering** and addressed to

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ACTING DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Value Engineering

SAQA QUAL ID	QUALIFICATION TITLE		
49745	National Certificate: Value Engineering		

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	120	Level 5	Regular-Unit Stds Based

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose

This qualification is aimed at people who work or intend to work within any industry, and who seek recognition for essential skills in Value Engineering.

Recipients of this qualification know about and are able to conduct Value Engineering studies and workshops.

The qualification is designed to be flexible and accessible so that people are able to demonstrate the competencies required to apply the Value Engineering methodology in various fields of applications.

People credited with this qualification are able to:

> Manage Human Dynamics & Change
> Apply basic principles of Costing, Pricing and Budgeting
> Manage a Project
> Conform to relevant Legislations
> Measure Performance & Improve Productivity
> Apply Functional Thinking

Rationale

This qualification provides a learner with all the skills and knowledge required of a Value Engineer.

Candidates for this qualification are likely to be working in the industry where continuous improvement of products, services and systems is a requirement. This qualification will give them the opportunity to balance their practical skills with the essential knowledge needed to earn a formal qualification in Value Engineering.

There is a critical need in the industry to identify people who are able to apply the essential methodologies associated with efficient and successful Value Engineering studies and workshop applications. 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 needs of the 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:

> Communication and Mathematical Literacy at NQF Level 4
> Computer Literacy
> Has the ability to source, gather, analyse and synthesise information using a variety of data collection and organising techniques.
> Has a general understanding of product orientated and general management processes.
> Project management competencies at NQF Level 4

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

Credit allocation of exit level outcomes:

> Manage Human Dynamics and Change, 3 Fundamental credits, 11 Core credits
> Apply basic principles of Costing, Pricing and Budgeting, 11 Fundamental credits, 10 Core credits
> Manage a Project, 4 Fundamental credits, 22 Core credits, 42 Elective credits
> Conform to a relevant Legislation, 8 Core credits
> Measure Performance and Improve Productivity, 4 Core credits, 54 Elective credits
> Apply Functional Thinking, 10 Core credits

Total : 17 Fundamental credits, 65 Core credits, 96 Elective credits (Of which 38 credits are required)

Rules of combination:

Fundamental:
Candidates are required to achieve all 17 credits listed in the Fundamental category

Core: □
Candidates must achieve all 65 credits listed in the Core category in Exit Level Outcomes.

Elective: □
Candidates must achieve at least 38 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.

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.

EXIT LEVEL OUTCOMES

Exit Level Outcome 1
> Manage Human Dynamics & Change.

Exit Level Outcome 2
> Apply basic principles of Costing, Pricing and Budgeting.

Exit Level Outcome 3
> Manage a Project.

Exit Level Outcome 4
> Conform to a relevant Legislation.

Exit Level Outcome 5
> Measure Performance and Improve Productivity.

Exit Level Outcome 6
> Apply Functional Thinking.

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.
>[Exit Level Outcomes: 3; 4; 5; 6]

> Working effectively with others as a member of a team, group, organisation or community.
> [Exit Level Outcomes: 1; 3; 4; 5; 6]

> Organising and managing oneself and one's activities responsibly and effectively.
> [Exit Level Outcomes: 1; 3; 5]

> Collecting, analysing, organising and critically evaluating information.
> [Exit Level Outcomes: 2; 3; 4; 5; 6]

> Communicating effectively using visual, mathematical and/or language skills in the modes of oral/written persuasion.
> [Exit Level Outcomes: 1; 3; 5; 6]

> Using science and technology effectively and critically, showing responsibility towards the environment and health of others.
> [Exit Level Outcomes: 3; 4; 5; 6]

> Demonstrating and understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
> [Exit Level Outcomes: 3; 4; 5: 6]

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

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, and
> The criteria specified for integrated assessment.

Integrated assessment:

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

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.

Criteria for integrative assessment of generic competence include:

Assessment criteria associated with Exit Level Outcome 1

> Be able to recognise team member performance, encourage participation in decision-making, delegate tasks and review decisions and the progress with delegated tasks.

> Be able to harness diversity and build on strength of a diverse working environment, identify the nature of diversity in the working environment, identify the positive consequences of diversity in the working environment, deal with diverse individuals and groups and deal with disagreements and conflict arising from diversity amongst individuals and groups.

> Be able to demonstrate knowledge of different types of meetings and their procedures, to prepare for a technical practitioners meeting, to chair a technical practitioners meeting and conduct post-meeting follow up for a technical meeting.

> Be able to recognise areas in need of change, then make recommendations and implement change in the team, department and division.

Assessment criteria associated with Exit Level Outcome 2

> Be able to record and analyse information relating to direct costs, to record and analyse information relating to allocation, apportionment and absorption of overhead costs, to prepare and present standard cost reports and demonstrate an understanding of the business and accounting environment.

> Be able to demonstrate an understanding of the business and accounting environment, to collect, analyse and disseminate information about costs and make recommendations to reduce costs and enhance value.

Assessment criteria associated with Exit Level Outcome 3

> Be able to evaluate proposals and select preferred option, to conceptualise plans, to delegate tasks and track projects.

> Be able to identify information flow needs in a team, department or division, to implement information flow systems in a team, department or division and monitor and review information flow.

> Be able to discuss and explain the appropriateness of the various organisational structures, to identify project types and nature and guiding on appropriate project strategies and tactics, to suggest appropriate structures, methods and processes to projects, to check and verify that a project environment is established, to evaluate and consolidate from project experiences and update standard structures and processes.

> Be able to discuss and explain the appropriateness of the various organisational structures, to supervise and monitor a developmental or business or technical project team, to report progress on a developmental or business or technical project, to identify and rectify problems occurring in a developmental or business or technical project and to set up, run and close a developmental project.

> Be able to keep abreast of and analyse innovations or new developments, to create opportunities for innovation, to lead projects to meet new, innovative ideas and to review new projects/procedures to determine effectiveness.

Assessment criteria associated with Exit Level Outcome 4

> Be able to identify Best Practice guidelines, to analyse current operating practices against identified Best Practices, to draw up a plan for implementing Best Practice and implement Best Practice.

> Be able to identify and access legislation, legal documents and rules, to interpret legislation, legal documents and rules, to comply with legislation and rules which regulate business in general and the department/division in particular and to identify areas of non-compliance.

Assessment criteria associated with Exit Level Outcome 5

> Be able to establish performance standards and monitoring systems, to prepare for performance review of team member and to conduct performance review interview.

> Be able to design a framework to collate data in an organisation related to factors influencing capital or labour or material productivity in an organisation, to measure the quantifiable factors that influence capital or labour or material productivity, to assess the identified qualitative factors that influence capital or labour or material productivity and establish the relative impact of each factor on capital or labour or material productivity and to assess capital or labour or material effectiveness.

> Be able to promote productivity improvement as a competitive strategy of the organisation, to nurture pro-active participation in the implementation of the organisational productivity improvement strategy and objectives and to monitor, evaluate and improve the impact of the organisational promotion strategy.

> Be able to identify the causes for unacceptable levels of productivity within the organisation, to identify priority areas for productivity improvement to develop a productivity improvement strategy and to develop plans for implementing the strategy in the identified priority areas.

> Be able to measure value-added productivity, to measure multi-factor productivity and to measure total factor productivity within an organisation.

Assessment criteria associated with Exit Level Outcome 6

> Be able to define the scope of work and functionality of design, to determine functional significance, to generate alternative solutions and to evaluate and select most appropriate solutions.

> Be able to define the scope of the project, to identify and select process and to co-ordinate the process over the various life cycle phases.

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; and
   > 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 country:
> United States of America

The USA qualification is, "Certified Value Specialist - CVS)" by the Society of American Value Engineers (SAVE)

The USA based qualifications does partially represent the SAQA requirements, 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 onto existing engineering qualifications and acts as a springboard from which learners may progress to more advanced 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 shows the location of this qualification in terms of other qualifications within the engineering field.

Mechanical Engineering
> NC Mechanical Engineering - NQF Level 5
> ND Mechanical Engineering - NQF Level 6

Value Engineering
> NC Value Engineering - NQF Level 5

Electrical Engineering
> NC Electrical Engineering - NQF Level 5
> ND Electrical Engineering - NQF Level 6

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 or an ETQA that has a Memorandum of Understanding with 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 relevant Industry, according to the moderation guidelines and the agreed ETQA procedures.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

The following criteria are specified for assessors concerning the technical aspects of the qualification:

> An appropriate qualification with at least eight years experience in Productivity Improvement environment.
> Assessors must be registered with the relevant ETQA.
> 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	10043 Develop, implement and manage a project / activity plan	Level 5	5	Reregistered
Core	10149 Support the project environment and activities to deliver project objectives	Level 5	14	Reregistered
Core	12996 Record, analyse and prepare cost information	Level 5	10	Registered
Core	15215 Identify and interpret Best Practice guidelines, and plan for and implement Best Practice within the team, department or division	Level 5	4	Registered
Core	15224 Empower team members through recognising strengths, encouraging participation in decision making and delegating tasks	Level 5	4	Registered
Core	15225 Identify and interpret related legislation and its impact on the team, department or division and ensure compliance	Level 5	4	Registered
Core	15226 Implement systems to meet the flow of information in a team, department or division	Level 5	3	Registered
Core	15230 Monitor team members and measure effectiveness of performance	Level 5	4	Registered
Core	15233 Harness diversity and build on strengths of a diverse working environment	Level 5	3	Registered
Core	114051 Conduct a technical practitioners meeting	Level 5	4	Registered
Core	114599 Apply Functional Value to Engineering Design	Level 5	6	Registered
Core	114601 Identify, select and co-ordinate value engineering project life cycle phase	Level 5	4	Registered
Elective	10146 Supervise a project team of a developmental project to deliver project objectives	Level 5	14	Reregistered
Elective	10147 Supervise a project team of a technical project to deliver project objectives	Level 5	14	Reregistered
Elective	10148 Supervise a project team of a business project to deliver project objectives	Level 5	14	Reregistered
Elective	114875 Measure and assess the factors that influence capital productivity and establish the relative impact of each factor	Level 5	8	Registered
Elective	114876 Measure and assess the factors that influence material productivity and establish the relative impact of each factor	Level 5	8	Registered
Elective	114879 Promote a productivity improvement strategy	Level 5	10	Registered
Elective	114882 Develop holistic productivity improvement strategies and plans	Level 5	10	Registered
Elective	114883 Measure value-added, multi factor and total factor productivity within an organisation	Level 5	10	Registered
Elective	114886 Measure and assess the factors that influence labour productivity and establish the relative impact of each factor	Level 5	8	Registered
Fundamental	12999 Contribute to the management of costs and the enhancement of value	Level 5	10	Registered
Fundamental	15214 Recognise areas in need of change, make recommendations and implement change in the team, department or division	Level 5	3	Registered
Fundamental	15216 Create opportunities for innovation and lead projects to meet innovative ideas	Level 5	4	Registered