



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

Manufacturing and Assembly Processes

registered by Organising Field 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 qualification and unit standards. The full qualification and unit standards can be accessed via the SAQA web-site at www.saqg.org.za. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the qualification and unit standards should reach **SAQA** at the address *below and no later than 19 February 2007*. All correspondence should be marked **Standards Setting – Manufacturing and Assembly Processes**, addressed to

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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:**National Certificate: CNC Production Machining**

SAQA QUAL ID	QUALIFICATION TITLE		
58025	National Certificate: CNC Production Machining		
SGB	PROVIDER		
SGB Manufacturing and Assembly Processes			
ETQA			
QUALIFICATION TYPE	FIELD	SUBFIELD	
National Certificate	6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly	
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUAL CLASS
Undefined	140	Level 5	Regular-Unit Stds Based
REGISTRATION STATUS	SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE
Draft - Prep for P			

The purpose of the qualification is to provide learners, education and training providers and employers with the standards and the range of learning required to manage and develop manufacturing capabilities, optimise manufacturing processes and plan and cost production in a CNC production machining environment.

This is the fourth qualification in a learning pathway for learners who want to follow a career in the field of CNC production machining, specifically in facilities which use machining and turning centres.

People working in the CNC production machining field require specialised technical skills and knowledge which combine some hand skills and an understanding of machining processes with more intensive production methods, greater control over the accuracy of dimensions and the maintenance of quality standards.

The primary skills that are recognised in this qualification are the ability to manufacture a range of complex new products, manage production and maintain production efficiencies, identify and resolve logistical, technical and human resource bottlenecks and shortcomings, and develop **cost** estimates, quotations and production schedules. These capabilities require an understanding of advanced CNC programming, the requirements of complex components, continuous improvement, the principles of costing and some manufacturing management principles.

Qualified learners will also understand:

- How a business functions.
 - o Their role in the business, i.e. in production and related activities.
 - o How they are affected by legislation, regulations, agreements and policies related to their particular work environment.

With this understanding learners will be able to participate effectively in workplace activities.

This qualification is applicable to the following contexts within a CNC environment:

- Costing and planning.
- Production management.
- Technical management/quality assurance.

Rationale:

The rapid uptake of new technology in the form of computerised numeric control (CNC) systems in South Africa and the emergence of South Africa as a cost-effective supplier to international markets has created a demand for people with the skills to operate, set and programme CNC equipment. In order to meet this demand in the form of learnerships and skills programmes, the industry needs an engineering machining qualification which focuses on the understanding and use of CNC systems and statistical process control (SPC). This qualification represents a shift away from the traditional field of engineering machining which is characterised by work-to-order, low volume manufacture of components using various machining methods. The emerging industry is characterised by greater precision, higher volumes, and higher standards of quality. This qualification spells out the skills needed to operate successfully in this new field.

This is the last in a learning pathway of four qualifications in a learning pathway for CNC production machining which begins with the National Certificate in CNC Production Machining NQF Level 2. The series provides a developmental pathway for the full range of activities required for production machining. The skills and knowledge required are described in a generic manner so that the changing needs of particular worksites can be met without requiring changes to the qualification or the unit standards.

Further career development after NQF Level 5 would be based on choices relating to the learner's aspirations: choices include but are not limited to the following:

- o General or technical management.
- o Quality management.
- o Advanced technology.

Typical learners would have achieved the Further Education and Training Certificate in CNC Production Machining. Once qualified, they would typically be responsible for responding to technical manufacturing challenges, developing programmes for complex components, managing production processes and resources and producing estimates and quotations. They would perform a range of tasks autonomously within the context of an overall team. This role represents a recognised position in the organisation.

This qualification series recognises skills, knowledge and values relevant to a workplace and requires workplace experience. It is suitable for learners who:

- o Attend courses and then apply the knowledge gained to activities in the workplace (Portfolio to reflect formative assessment); or
- Are already workers and have acquired the skills and knowledge without attending formal courses (RPL can be done through the summative assessment and portfolio of evidence).

The outcomes of this qualification combine skills and knowledge in the technical, inter-personal and business spheres, enabling the learner to perform the operational aspects of the work, function within a team context and contribute to value-adding processes within the organisation.

This qualification provides learners who have gained relevant experience in the workplace with an opportunity to obtain credits through an RPL process.

Learner achievements will contribute to the ability of South African companies to compete for work in the global economy, thus securing jobs and employment opportunities.

RECOGNIZE PREVIOUS LEARNING?

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LEARNING ASSUMED TO BE IN PLACE

It is assumed that learners are already competent in Communication and Mathematical Literacy at **NQF Level 4**.

In addition, learners are assumed to have the following skills at **NQF Level 4** in the context of CNC production machining:

- o Interpret drawings and develop CNC machining process plans, programmes and work instructions for new components.
- o Set up and qualify all the processes.
- o Identify and rectify manufacturing problems.

Recognition of Prior Learning:

This qualification may be obtained through a process of RPL. The learner should be thoroughly briefed prior to the assessment and support should be provided to assist the learner in the process of developing a portfolio. The guidelines for integrated assessment should be used to develop the RPL assessment process. As with integrated assessment, while this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the Exit Level Outcomes.

Access to the qualification:

There is open access to this qualification. A workplace is, however, a prerequisite to obtaining the relevant work experience and evidence required for the assessment of the Exit Level Outcomes.

'QUALIFICATION RULES

- o The total number of credits for this qualification is **140**.
- o The total number of credits in the Fundamental component is 32.
- o The total number of credits in the Core component is 90.
- o The minimum number of Elective credits is **18**.

The elective credits should be chosen in accordance with the requirements of the selected context and the interests of the learner.

EXIT LEVEL OUTCOMES

1. Manufacture a range of complex new products.
2. Manage production and maintain production efficiencies.
3. Identify and resolve logistical, technical and human resource bottlenecks and shortcomings.
4. Develop cost estimates, quotations and production schedules.

Critical Cross-field Outcomes:

The Critical Cross-Field Outcomes are supported by the Exit Level Outcomes as follows:

- o Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made (Exit Level Outcomes: 1, 2, 3, 4).
- Working effectively with others as a member of a team, group, organization and community (Exit Level Outcomes: 1, 2, 3, 4).
- Organising and managing oneself and one's activities responsibly and effectively (Exit Level Outcomes: 1, 2, 3, 4).

- Collecting, analyzing, organizing and critically evaluating information (Exit Level Outcomes: 1, 2, 3, 4).
- o Communicating effectively using visual, mathematical and/or language skills (Exit Level Outcomes: 1, 2, 3, 4).
- e Using science and technology effectively and critically, showing responsibility toward the environment and health of others (Exit Level Outcomes: 1, 2, 3, 4).
- e Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation (Exit Level Outcomes: 1, 2, 3, 4).

ASSOCIATED ASSESSMENT CRITERIA

1.
 - Programmes for a variety of products are used to produce products.
 - o Range: Variety includes 4th axis, solid modelling, shading.
 - e CAD drawings or models are produced in accordance with end-product requirements.
 - o Tools are selected and machining specifications are set to achieve desired characteristics of component.
 - o Data packs for the manufacturing process are specified for all elements of the manufacturing process.
 - o Principles and theories that underpin CAD, CAM are explained with regard to their relationship to CNC.
 - o Range: Principles and theories include knowledge of packages available, drawing conventions, verification methods and calculations.
2.
 - e Effectiveness and efficiency of process and the use of resources is tracked and evaluated and changes are responded to in accordance with requirements.
 - e The workplace is maintained in a clean, safe manner and is operating without bottlenecks or hazards.
 - Information on all aspects of the manufacturing process is monitored and trends are identified and responded to in accordance with requirements.
3.
 - o Manufacturing capacity is enhanced and developed in accordance with procedures.
 - e Improvements and new settings or procedures are documented and result in products that meet and continue to meet customer needs.
 - Changes or recommendations are based on systematic analysis and the effects of implementation are recorded and reported in accordance with requirements.
 - e Problems and conflicts are identified, addressed appropriately, resolved and documented in accordance with procedures.
4.
 - Orders are obtained, implemented and delivered in accordance with set standards.
 - e Design implementation is optimised for efficiency and cost-effectiveness.
 - Costing and scheduling are explained and applied in accordance with requirements.

Integrated Assessment:

The integrated assessment should be based on a summative assessment guide. The guide will specify how the assessor will assess different aspects of the performance and will include:

- Evaluating evidence in a portfolio of evidence, particularly projects which integrate various aspects of the qualification and which demonstrate the integration of all aspects of learning: fundamental and core; knowledge, skills and values; the development of the critical outcomes.
- Observing and listening to the learner at work, both in primary activities as well as in other interactions, or in relevant simulations.
- Asking questions and initiating short discussions to test understanding and to verify other evidence.

- o Looking at records and reports.
- o Formative and summative assessment of unit standards.

Assessment of competence for this qualification is based on experience acquired by the learner in the workplace, within the particular CNC production machining context. The assessment process should cover the explicit tasks required for the qualification as well as the understanding of the underlying concepts and principles. The assessment process should also establish how the learning process has advanced the Critical Cross-field Outcomes.

The learner may choose in which language he/she wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be presented if pertinent to any of the Exit Level Outcomes.

Assessors should also evaluate evidence that the learner has been, and is, able to perform consistently over a period of time.

INTERNATIONAL COMPARABILITY

Comparison was done with the following countries on the basis of best practice and how the practice is incorporated in the South African CNC Production Machining qualifications:

- o Australia.
- o Canada.
- Botswana.
- Germany.
- o India.
- o Kenya.
- o Nigeria.
- o Sweden.
- UK.
- o USA.

The general finding is that CNC courses in the countries above are not designed for occupational development on a step-by-step basis. Generally the courses assume a general knowledge of machining or engineering and build CNC knowledge and skills specific onto this. An example can be given with a 450-hour course offered in Sweden. The course cuts across 3 NQF levels. Other courses are designed to focus on specific pieces of equipment and trade stream such as a turning.

Training processes for the occupations outlined above are varied. The following encompass some of the options:

- Skills and knowledge upgrading of qualified tradespersons in the mechanical engineering field.
- o Short courses and on-the-job training.
- Apprenticeships.
- o Vocational education and training programmes followed by a work experience component.

The only way to make any meaningful comparisons was to compare occupational profiles in the following way:

- o Occupational role; Exit level outcomes.
- o Occupational activities; Unit standards and specific outcomes.

This approach can be supported by referring to curriculum contents and course outlines.

This qualification represents the learning progression for an occupation which focuses on the machining of precision parts and components using computer numerical control (CNC). The stages of development related to CNC machining equipment are:

- o Operator.
- o Setter, including elements of programming.
- o Programmer, including trouble shooting and management of manufacturing processes.
- o Specialist, including process design, costing, trouble shooting and selection and implementation of new technology.

Machining includes processes such as cutting, boring, turning, milling and grinding. It may also include punching and nibbling.

The above occupations and the related career path are similar to descriptions found in various OECD countries belonging to the Organisation for Economic Co-operation and Development (OECD), eg the United States of America:

o In the contexts above, workers plan and prepare the operation. Workers review three-dimensional computer aided/automated design (CAD) blueprints of the part as the first process. Next, they calculate where to cut or bore into the workpiece, how fast to feed the metal into the machine, and how much metal to remove. They then select tools and materials for the job and plan the sequence of cutting and finishing operations.

o Next, CNC programmers turn the planned machining operations into a set of instructions. These instructions are translated into a computer aided/automated manufacturing (CAM) program containing a set of commands for the machine to follow. These commands normally are a series of numbers (hence, numerical control) that describes where cuts should occur, what type of cut should be used, and the speed of the cut. CNC programmers and operators check new programs to ensure that the machinery will function properly and that the output will meet specifications. Because a problem with the program could damage costly machinery and cutting tools, computer simulations may be used to check the program instead of a trial run. If errors are found, the program must be changed and retested until the problem is resolved. In addition, growing connectivity between CAD/CAM software and CNC machine tools is raising productivity by automatically translating designs into instructions for the computer controller on the machine tool. These new CAM technologies enable programs to be easily modified for use on other jobs with similar specifications.

o After the programming work is completed, CNC operators perform the necessary machining operations. The CNC operators transfer the commands from the server to the CNC control module using a computer network link or floppy disk. Many advanced control modules are conversational, meaning that they ask the operator a series of questions about the nature of the task. CNC operators position the metal stock on the CNC machine tool-spindle, lathe, milling machine or other-set the controls, and let the computer make the cuts. Heavier objects may be loaded with the assistance of other workers, autoloaders, a crane, or a forklift. During the machining process, computer-control operators constantly monitor the readouts from the CNC control module, checking to see if any problems exist. Machine tools have unique characteristics, which can be problematic. During a machining operation, the operator modifies the cutting program to account for any problems encountered. Unique, modified CNC programs are saved for every different machine that performs a task.

o CNC operators detect some problems by listening for specific sounds-for example, a dull cutting tool or excessive vibration. Dull cutting tools are removed and replaced. Machine tools rotate at high speeds, which can create problems with harmonic vibrations in the workpiece. Vibrations cause the machine tools to make minor cutting errors, hurting the quality of the product. Operators listen for vibrations and then adjust the cutting speed to compensate. In older, slower machine tools, the cutting speed would be reduced to eliminate the vibrations, but the amount of time needed to finish the product would increase as a result. In newer, high-speed CNC machines, increasing the cutting speed normally eliminates the vibrations and reduces

production time. CNC operators also ensure that the workpiece is being properly lubricated and cooled, because the machining of metal products generates a significant amount of heat.

Apart from CNC-specific training, there are a number of common characteristics found in most general education and training programmes. These include:

- o Knowledge and ability to perform manual machining operations in at least one discipline.
- o Ability to read and interpret engineering drawings.
- o Knowledge of and ability to use and apply statistical process control techniques.
- o Principles and application of quality management systems, including customer focus.

In addition to these occupation-specific requirements, general requirements such as communication, mathematical literacy, safety, health and the environment, risk assessment, team skills, computer literacy and problem solving abilities are also required.

The German apprenticeship programme Zerspanungsmechaniker - (Metal cutting technology mechanic/technician) was selected as representative for this emerging occupation. The new trade was first registered in **2004**.

This qualification was selected because:

- o It is a fairly recent development.
- o It comes from a country with a well-known and effective vocational and occupational education and training system.
- o CNC machinery is manufactured in Germany so the qualification would reflect the latest technology.
- o It is an advanced trade aimed at creating a technical specialist.

The role and the activities of the mechanician include:

- o Evaluate and analyse production orders for technical feasibility.
- o Select sources of information and technical information for the execution of the manufacturing processes.
- Select production systems according to requirements.
- o Plan manufacturing processes, develop, optimise and implement programmes for numerically controlled production systems.
- o Use data sheets, descriptions, manuals and other occupation-typical information also in English.
- o Organize the workplace and operational sequences according to schedule and cost-effectively and efficiently.
- Manufacture components to specification by machine cutting technology and supervise the manufacturing process.
- o Use quality management systems, document and evaluate work and inspection results and derive from it measures for the optimisation of the product and the manufacturing process.
- o Supervise and examine safety measures, care for, maintain and examine production systems, work in the team, install the operation of production systems, co-ordinate their activities with other departments, respond to customer requirements.

The curriculum content of the three and a half year apprenticeship is as follows:

- o Vocational orientation, basic conditions of employment.
- o Structure and processes of the workplace.
- o Safety and health in the workplace.
- o Environment.
- o Business (office) and technical communication.
- o Planning and organising of work and the evaluation of the work-related results or outcomes.
- Identification, classification and handling of materials.

- o Manufacturing of components and parts.
- o Care and maintenance of production resources.
- o Application of control systems.
- o Fastening, securing and movement (of components to be machined).
- o Client orientation.
- Planning of manufacturing (machining) processes.
- o Programming numerically controlled machine tool and finishing systems.
- o Setting of machine tool and manufacturing finishing systems.
- o Manufacture of work pieces.
- o Overseeing and optimising of manufacturing processes.
- o Business and quality management in operational area.

Embedded in the curriculum is considerable work experience at different levels of learning.

Comparison with the South African **NQF** Level 5 qualification:

The activities and the role described for the metal cutting mechanic broadly correspond to the Exit Level Outcomes:

- o Manufacture a range of complex new products.
- o Manage production and maintain production efficiencies.
- o Identify and resolve logistical, technical and human resource bottlenecks and shortcomings.
- o Develop cost estimates, quotations and production schedules.

In addition, activities and curriculum content for the German qualification reflect in the selection of the unit standards and the essential embedded knowledge in the unit standards.

The duration of the apprenticeship (3.5 years) is less than the nominal 4800 notional hours (*ie* the total of all four qualifications) reflected in the credits. The addition of fundamental unit standards in the South African qualifications would account for a large part of the difference.

References:

Australia:

- o http://www.nmit.vic.edu.au/courses/manufacturing/engmech_cer3_a.html
- o <http://www.tafe.swin.edu.au/eng/>
- o http://domino.swin.edu.au/_CA256F56001FE705.nsf/0/3D02C44303D6F632CA25690E000A2FB8?OpenDocument&filter=D
- o McLennan, W (Statistician General) 1997. Australian Standard Classification of Occupations, Second Edition Canberra: Australian Bureau of Statistics.

Canada:

- o http://www.skillsCanada.com/en/corporate/profiles/index_cncturning.php
- o http://www.mcbridecareergroup.com/images/pdfs/cnc_machinist.pdf

Botswana:

- o http://www.ub.bw/departments/engineering/technology_mission.cfm

Germany:

- o <http://www.bibb.de/en/9673.htm>
- <http://www.bibb.de/de/11988.htm>

India:

o <http://delhigovt.nic.in/newdelhi/depfindustries/about.asp>

Kenya:

o www.learningresources.co.ke/downloads/SHE.PDF

Nigeria:

o <http://fmst.gov.ng/docs/2004MinisetrialPress6riefing.pdf>

Sweden:

o

<http://kaplanskolan.skelleftea.se/Skrivbord/Dokument%20KP/Site%20KP/English?templates=eduPage>

UK:

• <http://www.learndirect-advice.co.uk/helpwithyourcareer/jobprofiles/profiles/profile825/>

• <http://www.connexions-direct.com/jobs4u/jobfamily/engineering/toolmakermachinesetter.cfm?fd=503>

USA:

o <http://www.bls.gov/oco/ocos286.htm>

o <http://www.umsi.edu/services/govdocs/ooh20002001/356.htm>

o <http://w.btc.ctc.edu/coursedocs/Programs/pComputerizedMachining.asp>

o <http://w.ntma.org/eweb/StartPage.aspx>

o <http://www.i-train.org//CourseDisplay.asp?db=I&provider=C8088>

o <http://www.akronmach.com/cnc2.htm>

Country specific searches were also made for Brazil, Korea, Japan, Swaziland, Zimbabwe, Zambia.

ARTICULATION OPTIONS

This qualification articulates vertically with:

o ID: **49744**: National Diploma: Engineering Technology: NQF Level 6.

o ID: 49059: National Diploma: Master Craftsmanship: NQF Level 5.

This qualification articulates horizontally with other engineering qualifications at this level, eg:

o ID **22425**: National Certificate: Engineering and Related Design Level 5.

o ID **49061**: National Certificate: Master Craftsmanship, Level 5.

MODERATION OPTIONS

• Anyone assessing a learner or moderating the assessment of a learner against this Qualification must be registered as an assessor with an appropriate Education and Training Quality Assurance Body (ETQA) or with an **ETQA** that has a Memorandum of Understanding 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 or with an ETQA that has a Memorandum of Understanding with the relevant ETQA.

• Moderation of assessment will be overseen by the relevant ETQA or by an ETQA that has a Memorandum of Understanding with the relevant ETQA, according to the ETQA's policies and guidelines for assessment and moderation.

o 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 as well as in the exit level outcomes described in the Qualification.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

The following criteria should be applied by the relevant ETQA:

- Appropriate qualification at one level higher than the level of the qualification with a minimum of 2 years' experience of a relevant process of CNC production machining.
- Registration as an assessor with a relevant ETQA.

NOTES

N/A

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	13333	Write computer numerical controlled (CNC) programmes for CNC machining centres using proprietary software	Level 5	30
Core	13301	Produce complex engineering drawings	Level 4	6
Core	243340	Develop cost estimates and quotations	Level 5	10
Core	243342	Plan and initiate the CNC machining process for complex components	Level 5	10
Core	116783	Analyse trends and implement continuous improvements	Level 5	10
core	13237	Optimise the quality assurance system	Level 5	6
Core	12458	Develop the skills of a work team	Level 5	10
Core	243341	Assess and select CNC machining equipment and technology for acquisition	Level 5	8
Elective	119170	Plan, schedule and monitor plastics production	Level 5	8
Elective	116793	Determine the viability of a business and monitor its performance	Level 5	10
Elective	116786	Manage the cash flow of a small business or a business unit	Level 5	10
Elective	13203	Counsel workgroup members in respect of HIV/AIDS	Level 5	3
Elective	15235	Prepare and conduct staff selection interviews	Level 5	3
Elective	119180	Schedule and arrange maintenance and repairs for manufacturing operations	Level 5	4
Elective	9904	Coordinate work group to produce product	Level 5	8
Elective	116782	Control logistical flow of components and materials	Level 5	8
Elective	119168	Order and ensure delivery from external suppliers for plastics manufacturing processes	Level 5	4
Fundamental	12433	Use communication techniques effectively	Level 5	8
Fundamental	12432	Use mathematical and statistical techniques effectively	Level 5	20
Fundamental	15225	Identify and interpret related legislation and its impact on the team, department or division and ensure compliance	Level 5	4



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:***Develop cost estimates and quotations***

SGB		PROVIDER	
SGB Manufacturing and Assembly Processes			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 5	10
REGISTRATION STATUS	REGISTRATION START DATE	REGISTRATION END DATE	SAQA DECISION NUMBER
Draft - Prep for P Comment			

SPECIFIC OUTCOME 1

Determine product and manufacturing requirements from customer specifications and clarify customer needs where required.

SPECIFIC OUTCOME 2

Determine the time lines, the critical path and the resources required to complete the ordered items.

SPECIFIC OUTCOME 3

Determine the costs required to produce the ordered items.

SPECIFIC OUTCOME 4

Develop market related quotations.

SPECIFIC OUTCOME 5

Submit quotation to customer for authorisation, respond to questions and follow up where required.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Assess and select CNC machining equipment and technology for acquisition

SAQA US ID		UNIT STANDARD TITLE	
243341		Assess and select CNC machining equipment and technology for acquisition	
SGB Manufacturing and Assembly Processes			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 5	8
REGISTRATION STATUS	REGISTRATION START DATE	REGISTRATION END DATE	SAQA DECISION NUMBER
Draft - Prep for P Comment.			

SPECIFIC OUTCOME 1

Analyse the needs and determine the criteria for the required technology or equipment.

SPECIFIC OUTCOME 2

Survey available equipment and technology, select appropriate options and choose most effective solution.

SPECIFIC OUTCOME 3

Compile proposals and make recommendations.

SPECIFIC OUTCOME 4

Plan and oversee introduction of new technology.

SPECIFIC OUTCOME 5

Compile operating instructions and implement the new technology or equipment.

SPECIFIC OUTCOME 6

Oversee the training of team members in the new technology.

SPECIFIC OUTCOME 7

Evaluate the impact of the new equipment or technology on the company and the operations.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Plan and initiate the CNC machining process for complex components

SAQA US ID	UNIT STANDARD TITLE		
243342	Plan and initiate the CNC machining process for complex components		
SGB	PROVIDER		
SGB Manufacturing and Assembly Processes			
FIELD	SUBFIELD		
6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly		
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 5	10
REGISTRATION STATUS	REGISTRATION START DATE	REGISTRATION END DATE	SAQA DECISION NUMBER
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SPECIFIC OUTCOME 1

Plan the manufacturing process, process parameters and tooling.

SPECIFIC OUTCOME 2

Generate CNC programmes from **CAD** component drawings and manufacturing plans and make available to relevant personnel.

SPECIFIC OUTCOME 3

Compile work instructions for the efficient production of complex components.

SPECIFIC OUTCOME 4

Determine quality checks and select testing and measuring methods.

SPECIFIC OUTCOME 5

Evaluate manufactured components, review change requests and update master data packs and programmes.

SPECIFIC OUTCOME 6

Engage in discussions with other parties on issues related to the CNC manufacturing process.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Contribute to and implement a marketing strategy for the motor retail business

SGB		PROVIDER	
SGB Generic Management			
FIELD		SUBFIELD	
3 - Business, Commerce and Management Studies		Generic Management	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 6	16
REGISTRATION STATUS	REGISTRATION START DATE	REGISTRATION END DATE	SAQA DECISION NUMBER
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SPECIFIC OUTCOME 1

Gather, analyse and evaluate market and motor retail business information.

SPECIFIC OUTCOME 2

Contribute to the development of a marketing strategy for a motor retail business.

SPECIFIC OUTCOME 3

Develop marketing plans and programmes to implement the marketing strategy.

SPECIFIC OUTCOME 4

Implement marketing plans and monitor marketing activities.

SPECIFIC OUTCOME 5

Evaluate and adjust marketing programmes and activities.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Review and revise a performance management system for the motor retail business

SAQA US ID		UNIT STANDARD TITLE	
243475		Review and revise a performance management system for the motor retail business	
SGB		PROVIDER	
SGB Generic Management			
FIELD		SUBFIELD	
3 - Business, Commerce and Management Studies		Generic Management	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 6	10
REGISTRATION STATUS	REGISTRATION START DATE	REGISTRATION END DATE	SAQA DECISION NUMBER
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SPECIFIC OUTCOME 1

Review the effectiveness of the performance management system.

SPECIFIC OUTCOME 2

Analyse business processes, identify, select and prioritise potential areas of improvement and determine new key performance areas.

SPECIFIC OUTCOME 3

Consult with management team and staff and set key performance indicators.

SPECIFIC OUTCOME 4

Develop an action plan and implement the revised performance management system.

SPECIFIC OUTCOME 5

Evaluate the impact of the revised performance management system on morale and the achievement of business objectives.