No. 1125 **1 October 2004**

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

Geographical Information Sciences

Registered by NSB 12, Physical Planning and Construction, 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.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.

Comment on the unit standards should reach SAQA at the address ***below and no later than 30 October 2004.*** All correspondence should be marked **Standards Setting – SGB Geographical Information Sciences** and addressed to

The Director: Standards Setting and Development
SAQA
Attention: Mr. D Mphuthing
Postnet Suite 248
Private Bag X06
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JOE SAMUELS
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Geographical Information Sciences

SAQA QUAL ID	*QUALIFICATION TITLE*	
49063	National Certificate: Geographical Information Sciences	
SGB NAME	SGB Geographical Information Sciences	
ABET BAND	*PROVIDER NAME*	
Undefined		
QUALIFICATION CODE	*QUAL TYPE*	*SUBFIELD*
PPC-5-National Certificate	National Certificate	Physical Planning, Design and Management
MINIMUM CREDITS	*NQF LEVEL*	*QUALIFICATION CLASS*
120	Level 5	Regular-Unit Stds Based
SAQA DECISION NUMBER	*REGISTRATION START DATE*	*REGISTRATION END DATE*

PURPOSE OF THE QUALIFICATION

This qualification has been developed for the Geographical Information Science (GISc) occupational area. It aims, through a planned combination of unit standards, to equip learners with skills and knowledge to undertake GISc related tasks and duties in an operational environment, by applying spatial data in different forms for specified outcomes in relation to the generic application of geographical information systems in the fields of map production, spatial awareness and data capturing.

This qualification has been developed to assist with professional advancement across the GISc industry. This will allow learners to register as a systems operator in the Geo-informatics field and lay a foundation for future career advancement in this learning area.

Rationale for the Qualification:

As a result of past legacies many practitioners within the Geographical Information Sciences or Geo-informatics occupational area were denied career advancement and possible registration with a relevant professional body. This was as a direct result of poor educational opportunities at some schools, leading to a lack of entry to higher education institutions. This qualification will address environmental issues that are relevant to the field of geo-informatics by allowing for the socio economic empowerment of learners whilst simultaneously improving the skills base of the country and underpin the country's economic development, planning, infrastructure and sustainable property and agricultural development.

The introduction of a National Certificate in GISc based on unit standards will therefore allow learners to enter the occupational area as Geographical Information Systems (GIS) Operators and to reach full potential of advancement without formal education becoming an impassable barrier and in addition, allow for the recognition of prior learning. It will further explore the Information Technology environment linking spatial data to their attributes stored in a secured computerised system that is underpinned by a proper disaster recovery facility.

The qualifying learner should be able to undertake GISc related tasks and duties in an operational environment by applying spatial data in different forms for specific outcomes and be able to register as a Systems Operator in the geo-informatics field.

RECOGNIZE PREVIOUS LEARNING?

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LEARNING ASSUMED TO BE IN PLACE

It is assumed that a learner entering a programme leading to this qualification has achieved a National Certificate at NQF level 4 or equivalent and is proficient in Numeracy including Mathematics and in Communication including writing of technical reports or has two years in GIS related experience.

Recognition of Prior Learning (RPL):

This qualification could be achieved wholly or in part through recognition of prior learning (RPL) which includes formal, informal and non-formal learning and workplace experience in the GIS and related fields. Any learner who has met the requirements of any unit standard in this qualification and wish to be assessed may arrange to do so to the relevant Education and Training Authority (CETA) without having to attend further education or training. The applicant will be assessed against the specific outcomes and with the associated assessment criteria for the relevant unit standard(s). The assessor will decide on the most appropriate assessment procedures after discussion with the learner. Because this is a unit standard based qualification, any learner who demonstrates competence as required by the fundamental, core and relevant elective unit standards to access this qualification.

QUALIFICATION RULES

The Qualification - National Certificate in GISc at level 5 is made up of a number of three learning components and numerous learning areas. All unit standards within the Fundamental and Core have to be completed for the qualification.

The learning components and credit allocations are:
Fundamental: Credits 32 (minimum)
Core: Credits 67
Elective: Credits 21

To be proficient in any one learning area under the Elective of the Qualification, it is recommended that all unit standards within that learning area be completed. A minimum of 20 credits from the Elective must be completed for the qualification. The learning areas listed below and relevant unit standard titles are identified to assist users, and not as a conclusive list:

Basic Workflow:
> Manage a work process; and
> Develop, implement and manage a project/activity plan.

Spatial Analysis:
> Perform spatial analysis under supervision; and
> Perform spatial statistical analysis and communicate findings.

System and software operation:
> Operate a geographical information system and components thereof; and
> Design and produce cartographic products and maps with the use of a Geographical Information System.

Data Transfer:
> Demonstrate an understanding of digital data transfer.

Data Manipulation:
> Identify and select the appropriate map projection and carry out conversions (between map projections) for a specific project;
> Select a map projection and transform data between projections or ellipsoids;
> Demonstrate a basic understanding of vector transformation principles;
> Select a map projection for cartographic design and production; and
> Aggregate and integrate vector geo-information data.

Data Collection & Capture:
> Assess fitness for use of spatial data;
> Demonstrate knowledge of capture methods for primary spatial data; and
> Demonstrate knowledge of sources for spatial data.

Basic Remote sensing:
> Apply basic photogrammetric compilation principles for map production;
> Geo-referencing of image/Remote sensing data according to specifications; and
> Prepare a satellite imagery.

EXIT LEVEL OUTCOMES

The Exit Level Outcomes indicate a planned combination of Specific Outcomes and Critical-Cross Outcomes in terms of competent and applied performance capturing the Core, Fundamental and Elective Unit Standards with Associated Assessment Criteria. These at least indicate explicit exit points should a

learner fail to complete the qualification.

On achieving this qualification a learner will be able to:

1. Undertake work in the field of geo-informatics or geographical graphical information science in any working environment by collecting, presenting and managing spatial data in differing forms.
2. Relevant spatial data are imported into Geographic Information System (GIS).
3. Spatial data is managed under supervision by applying suitable back-up, archiving and storage procedures in a secured environment.
4. Use a wide variety of instruments, techniques, workstations, computer systems and software to collect and process spatial information.
5. Evaluate raw and processed data and confirm acceptance of Geo-informatics results.
6. Display an understanding of spatial awareness required in support of the practical outcomes in the form of geographical spatial information, attribute data and meta data.
7. Capture attribute data to further describe geographical features according to user requirements.
8. Demonstrate an understanding of the different statutes and related policies governing the GIS field as related to professional ethics, values and safety.

Generic exit level outcomes:

Work effectively within a team/group or individually under supervision while continuously monitoring and adapting own performance.

ASSOCIATED ASSESSMENT CRITERIA

Assessment criteria associated with exit level outcomes:

1. Different spatial data sources are identified and collected.
2. Spatial data are manipulated and presented in specified formats in accordance with the task requirements, for example, plans, maps, images, charts, graphs.
3. Spatial analysis is performed to present derived spatial statistical results in specified formats.
4. Basic survey and/or remote sensing techniques are applied for collecting spatial information by using instruments and techniques such as elementary global positioning systems and/or photogrammetary.
5. Computer systems and software are used on the GIS workstations to process spatial information.
6. Raw and processed data are evaluated according to fitness for purpose to comply with intended results.
7.
> The basic concepts and principles in the in GISc are explained and described in terms of data structures and geographical features.
> Task specific meta data is captured in compliance with the national standards.
8. Relevant sections relating to professional ethics, values and safety contained in the GIS statutes and other policies regulating the GIS environment are described and explained.

Generic assessment criteria:

1. Identify GIS related problems and solutions that address own life situations and communicate the results to the GIS community and the world at large using Mathematics and communication skills.
2. GIS related problems are identified and solutions are formulated and knowledge of Geographic Information System is used in such a way as to minimize reoccurrence or inefficiencies in this respect.
3. Problems related to his/her own life situations are identified and solved in which responses show that responsible decisions using critical and creative thinking have been made.
4. Visual Mathematics and language skills in the modes of oral and written presentations are used to communicate effectively with the GISc community and the world at large.
5. An ability to work individually or within a team/group under supervision is demonstrated.
6. An ability to monitor and adapt one's performance is demonstrated.

Integrated Assessment:

Integrated assessment provides learners with an opportunity to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. Learners will therefore be expected to demonstrate competence that integrates the assessment of all specific outcomes before qualifying for this qualification, as well as give evidence that they have attained embedded knowledge and specific skills contained in specific outcomes for each relevant unit standard.

Assessment shall:

> Team work.
> Self-organisation and self-management.
> Communication.
> Use of scienceand technology.

Apply health and safety to a work area:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.

Understand fundamentals of electricity:
> Informationevaluation.
> Team work.
> Self-organisation and self-management.
> Communication.
> Use of scienceand technology.

Demonstrate an understanding of the fundamental elements of railway signalling:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Identify, route, harness and terminate electrical conductors used in railway signalling:
> Informationevaluation.
> Self-organisation and self-management.
> Inter-relatedness of systems.
> Learner and societal development

Assemble an apparatus case:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Assemble an electrical points machine:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Assemble components of a railway signalling interlocking system:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.

the competence described both in individual unit standards as well as the integrated competence described in the qualification.
> Anyone wishing to become an assessor or provider of learning must provide an affordable assessment / learning service.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

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

> A minimum of 2 (two) years' relevant occupational experience at NQF level 5.
> Declared competent in all the outcomes of the National Assessor Unit Standards as stipulated by SAQA.
> Detailed documentary proof of educational qualification, practical training undergone, experience gained by the applicant must be provided (Portfolio of evidence).

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	11725 Interpret photographic detail from aerial photography for annotation purposes	Level 4	4	Registered
Core	116819 Apply basic Geographic Information System (GIS) vector software functions	Level 4	2	Draft - Prep for P Comment
Core	116825 Design and produce hard copy geo-information output under supervision	Level 4	7	Draft - Prep for P Comment
Core	116835 Aggregate and integrate vector geo-information data	Level 4	7	Draft - Prep for P Comment
Core	116869 Demonstrate an understanding of the basic principles of geographical features	Level 4	3	Draft - Prep for P Comment
Core	116901 Apply basic Geo-Information System (GIS) raster software functions	Level 4	4	Draft - Prep for P Comment
Core	116828 Demonstrate a basic understanding of geographical space and spatial relationships	Level 5	12	Draft - Prep for P Comment
Core	116831 Demonstrate an understanding of the capabilities of Geo-Information Systems	Level 5	7	Draft - Prep for P Comment
Core	116833 Use geo-information output products	Level 5	10	Draft - Prep for P Comment
Core	116874 Demonstrate basic understanding of GIS vector data structures for data acquisition	Level 5	3	Draft - Prep for P Comment
Core	11821 Design a cartographic product according to cartographical specifications and design standards	Level 6	8	Registered
Elective	116826 Comply with the geoscience code of ethics	Level 3	3	Draft - Prep for P Comment
Elective	14926 Describe information systems departments in business organisations	Level 4	3	Registered
Elective	116817 Geo-reference image / remote sense data according to specifications	Level 4	5	Draft - Prep for P Comment
Elective	116824 Demonstrate knowledge of sources for spatial data	Level 4	1	Draft - Prep for P Comment
Elective	116829 Demonstrate knowledge of capturing methods for primary spatial data	Level 4	8	Draft - Prep for P Comment
Elective	10043 Develop, implement and manage a project / activity plan	Level 5	5	Registered
Elective	14274 Apply basic photogrammetric compilation principles for map production	Level 5	6	Registered
Elective	14275 Operate a geographical information system and components thereof	Level 5	6	Registered
Elective	14276 Design and produce cartographic products and maps with use of a geographical information system	Level 5	8	Registered
Elective	14277 Select a map projection for cartographic design and production	Level 5	4	Registered
Elective	116821 Prepare a satellite imagery	Level 5	10	Draft - Prep for P Comment
Elective	116822 Show understanding of vector transformation principles	Level 5	2	Draft - Prep for P Comment
Elective	116823 Disseminate spatial data	Level 5	2	Draft - Prep for P Comment
Elective	116830 Perform spatial statistical analysis	Level 5	2	Draft - Prep for P Comment

Elective	116832 Manage a work process	Level 5	3	Draft - Prep for P Comment
Elective	116834 Perform spatial analysis under supervision	Level 5	4	Draft - Prep for P Comment
Elective	116864 Assess fitness for use of spatial data	Level 5	13	Draft - Prep for P Comment
Elective	11820 Select a map projection and transform data between projections or ellipsoids	Level 6	3	Registered
Elective	116836 identify and select the appropriate map projection and carry out conversions between map projections for a specific project	Level 6	12	Draft - Prep for P Comment
Fundamental	9533 Use communication skills to handle and resolve conflict in the workplace	Level 3	3	Registered
Fundamental	7465 Collect and use data to establish complex statistical and probability models and solve related problems	Level 4	5	Registered
Fundamental	7468 Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	2	Registered
Fundamental	8979 Use language and communication in occupational learning programmes	Level 4	5	Registered
Fundamental	12417 Measure, estimate & calculate physical quantities & explore, critique & prove geometrical relationships in 2 and 3 dimensional space in the life and workplace of adult with increasing responsibilities	Level 4	4	Reregistered
Fundamental	14920 Participate in groups and/or teams to recommend solutions to problems	Level 4	3	Registered
Fundamental	14934 Demonstrate an understanding of hardware components for personal computers or handheld computers	Level 4	7	Registered
Fundamental	15233 Harness diversity and build on strengths of a diverse working environment	Level 5	3	Registered

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Assessment shall:

> Measure the quality of the observed practical performance as well as the theory and underpinning knowledge behind it.
> Use methods that are varied to allow the learner to display thinking and decision making in the demonstration of practical performance.
> Maintain a balance between practical performance and theoretical assessment methods to ensure each is measured in accordance with the level of the qualification.
> The relationship between practical and theoretical is not fixed but varies according to the type and level of qualification.

Summative assessment:

Summative assessment is carried out at the end of the learning period to confirm that the learner has demonstrated the required competencies against a particular unit standard. A detailed portfolio of evidence should be provided in this instance to prove the practical, applied and foundational competencies of the learner.

Formative assessment:

The assessment criteria for formative assessment are describes in the various unit standards. This type of assessment will take place during the process of learning and assessors should be fair and consistent in their approach of assessment and therefore use a range of assessment tools that support each other to assess competencies. These include:
> Projects.
> Structured group discussions.
> Experiential learning.
> Working in teams.
> Portfolio of evidence.
> Oral or written report backs.

INTERNATIONAL COMPARABILITY

Within the Geo-informatics field the concept of qualifications based on unit standards is not unique to South Africa. A learner having gained this Qualification will be able to register with the South African Council for Professional and Technical Surveyors (PLATO) in terms of Act 40 of 1984 and through this body's reciprocal agreements with other similar bodies gain international recognition.

In terms of international comparisons, none truly exists as this is a new discipline. Those available are at a higher level, and at this level we have extracted relevant aspects. This qualification has been referenced specifically to the international UNIGIS Certificates (Honours and Masters levels) and URISA (American GIS Society) which is currently still being developed. The New Zealand qualification (NZQA) was also evaluated at the same level and it was found that some aspects were lacking.

ARTICULATION OPTIONS

This qualification has been developed for professional practice across the industry and is intended to provide professional advancement in the industry ensuring the upliftment of the standards in general.

It is applicable to small and large business alike. This qualification builds on other certificates from a range of sub-sectors and will provide articulation both horizontally and vertically in a range of qualifications in both management and service areas of practice such as in the geo-information science field i.e. photogrammetry, cartography, remote sensing, geo-informatics.

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 ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (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

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 1

Comply with the geoscience code of ethics

SAQA US ID	*UNIT STANDARD TITLE*
116826	Comply with the geoscience code of ethics

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Obtain and describe the geo-science code of conduct.

SPECIFIC OUTCOME 2

Adhere to the code of conduct when dealing with stakeholders within the geoscience discipline.

SPECIFIC OUTCOME 3

Identify and understand the ethical issues of the geoscience discipline.

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UNIT STANDARD: 2

Aggregate and integrate vector geo-information data

SAQA US ID	*UNIT STANDARD TITLE*
116835	Aggregate and integrate vector geo-information data

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	7

Specific Outcomes:

SPECIFIC OUTCOME 1

Combine two or more existing data sets having different characteristics.

SPECIFIC OUTCOME 2

Conflate two or more existing data sets having the same characteristics.

SPECIFIC OUTCOME 3

Aggregate lower level objects into higher level objects.

SPECIFIC OUTCOME 4

Demonstrate a basic understanding of projections, co-ordinate systems, datums and scale.

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UNIT STANDARD: 3

Apply basic Geo-Information System (GIS) raster software functions

SAQA US ID	*UNIT STANDARD TITLE*
116901	Apply basic Geo-Information System (GIS) raster software functions

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	4

Specific Outcomes:

SPECIFIC OUTCOME 1

Launch an application and access raster geo-information.

SPECIFIC OUTCOME 2

Perform basic data manipulation.

SPECIFIC OUTCOME 3

Perform basic queries on raster data.

SPECIFIC OUTCOME 4

Produce basic geo-information outputs.

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UNIT STANDARD: 4

Apply basic Geographic Information System (GIS) vector software functions

SAQA US ID	*UNIT STANDARD TITLE*
116819	Apply basic Geographic Information System (GIS) vector software functions

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Launch application and access geo-information.

SPECIFIC OUTCOME 2

Perform basic data manipulation.

SPECIFIC OUTCOME 3

Perform basic queries.

SPECIFIC OUTCOME 4

Produce basic Geo-information output.

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UNIT STANDARD: 5

Demonstrate an understanding of the basic principles of geographical features

SAQA US ID	*UNIT STANDARD TITLE*
116869	Demonstrate an understanding of the basic principles of geographical features

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of geographical features and layers.

SPECIFIC OUTCOME 2

Demonstrate an understanding of topology.

SPECIFIC OUTCOME 3

Demonstrate an understanding of feature types.

SPECIFIC OUTCOME 4

Demonstrate an understanding of feature attributes.

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UNIT STANDARD: 6

Demonstrate knowledge of capturing methods for primary spatial data

SAQA US ID	*UNIT STANDARD TITLE*
116829	Demonstrate knowledge of capturing methods for primary spatial data

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	8

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of the techniques being used in surveying to do primary spatial data ca

SPECIFIC OUTCOME 2

Demonstrate an understanding of the remote sensing techniques used for primary spatial data capture.

SPECIFIC OUTCOME 3

Demonstrate an understanding of the techniques used in census and sampling for primary spatial data

SPECIFIC OUTCOME 4

Demonstrate an understanding of the need for and importance of metadata.

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UNIT STANDARD: 7

Demonstrate knowledge of sources for spatial data

SAQA US ID	*UNIT STANDARD TITLE*
116824	Demonstrate knowledge of sources for spatial data

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	1

Specific Outcomes:

SPECIFIC OUTCOME 1

Identify the different sources for the core data sets as defined by South Africa's Committee for Spa

SPECIFIC OUTCOME 2

Identify the different sources for other vector data sets.

SPECIFIC OUTCOME 3

Identify the different sources for other raster data sets.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 8

Design and produce hard copy geo-information output under supervision

SAQA US ID	*UNIT STANDARD TITLE*
116825	Design and produce hard copy geo-information output under supervision

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	7

Specific Outcomes:

SPECIFIC OUTCOME 1

Collate specified input data from various sources and formats.

SPECIFIC OUTCOME 2

Select layer characteristics and sequence as specified.

SPECIFIC OUTCOME 3

Place map furniture as specified.

SPECIFIC OUTCOME 4

Publish hard copy output according to specifications.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 9

Geo-reference image / remote sense data according to specifications

SAQA US ID	*UNIT STANDARD TITLE*
116817	Geo-reference image / remote sense data according to specifications

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-4-SGB GISc	Regular	Level 4	5

Specific Outcomes:

SPECIFIC OUTCOME 1

Prepare data sets for geo-referencing and or ortho-rectification of imagery according to specificati

SPECIFIC OUTCOME 2

Perform geo-referencing and or ortho-rectification of image.

SPECIFIC OUTCOME 3

Evaluate resultant image according to specifications.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 10

Assess fitness for use of spatial data

SAQA US ID	*UNIT STANDARD TITLE*
116864	Assess fitness for use of spatial data

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	13

Specific Outcomes:

SPECIFIC OUTCOME 1

Employ parameters given for doing the assessment.

SPECIFIC OUTCOME 2

Apply quality assurance in assessing the fitness of use of data for a specific project or applicatio

SPECIFIC OUTCOME 3

Demonstrate an ability to check data manually, semi-automatically and fully automatically.

SPECIFIC OUTCOME 4

Log and report on the results, and determine whether or not the data are fit to use.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 11

Demonstrate a basic understanding of geographical space and spatial relationships

SAQA US ID	*UNIT STANDARD TITLE*
116828	Demonstrate a basic understanding of geographical space and spatial relationships

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	12

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate a basic understanding of geography in order to understand the context within which a GIS

SPECIFIC OUTCOME 2

Demonstrate an awareness of geographical location in order to understand the context within which a

SPECIFIC OUTCOME 3

Read maps and aerial photographs in order to understand the context within which a GIS is used.

SPECIFIC OUTCOME 4

Demonstrate an understanding of elementary GIS concepts.

SPECIFIC OUTCOME 5

Demonstrate knowledge of the nature of geographical data.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 12

Demonstrate an understanding of the capabilities of Geo-Information Systems

SAQA US ID	*UNIT STANDARD TITLE*
116831	Demonstrate an understanding of the capabilities of Geo-Information Systems

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	7

Specific Outcomes:

SPECIFIC OUTCOME 1

Describe the potential capabilities of Geo Information Systems.

SPECIFIC OUTCOME 2

Describe the Potential Capabilities of Spatial Analysis.

SPECIFIC OUTCOME 3

Describe the limitations and risks associated with geo- information systems and data.

SPECIFIC OUTCOME 4

Describe the costs associated with the use of geo information spatial analysis and systems.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 13

Demonstrate basic understanding of GIS vector data structures for data acquisition

SAQA US ID	*UNIT STANDARD TITLE*
116874	Demonstrate basic understanding of GIS vector data structures for data acquisition

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Use a prescribed spatial reference framework to set up a data capture environment.

SPECIFIC OUTCOME 2

Use the appropriate feature type for data capture.

SPECIFIC OUTCOME 3

Demonstrate an understanding of the basic theory and principles of Spatial data models used in data

SPECIFIC OUTCOME 4

Demonstrate a basic understanding of data base structures for data capturing.

SPECIFIC OUTCOME 5

Explore geo-data sources.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 14

Disseminate spatial data

SAQA US ID	*UNIT STANDARD TITLE*
116823	Disseminate spatial data

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Determine nature of input data.

SPECIFIC OUTCOME 2

Determine characteristics and format of output data.

SPECIFIC OUTCOME 3

Assess converted data for correctness.

SPECIFIC OUTCOME 4

Identify most appropriate media for the task required.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 15

Manage a work process

SAQA US ID	*UNIT STANDARD TITLE*
116832	Manage a work process

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan the workflow process.

SPECIFIC OUTCOME 2

List task-specific milestones and draw up daily work plans.

SPECIFIC OUTCOME 3

Measure and evaluate the workflow progress.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 16

Perform spatial analysis under supervision

SAQA US ID	*UNIT STANDARD TITLE*
116834	Perform spatial analysis under supervision

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	4

Specific Outcomes:

SPECIFIC OUTCOME 1

Perform attribute analysis.

SPECIFIC OUTCOME 2

Perform integrated processing of geometry and attributes.

SPECIFIC OUTCOME 3

Perform connectivity operations.

SPECIFIC OUTCOME 4

Generate digital terrain models.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 17

Perform spatial statistical analysis

SAQA US ID	*UNIT STANDARD TITLE*
116830	Perform spatial statistical analysis

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Display a knowledge and understanding of spatial sampling.

SPECIFIC OUTCOME 2

Display a knowledge and understanding of correlation analysis.

SPECIFIC OUTCOME 3

Display a knowledge and understanding of linear spatial analysis techniques.

SPECIFIC OUTCOME 4

Display a knowledge and understanding of non-linear spatial analysis techniques.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 18

Prepare a satellite imagery

SAQA US ID	*UNIT STANDARD TITLE*
116821	Prepare a satellite imagery

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	10

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate knowledge of data structures used for satellite imagery.

SPECIFIC OUTCOME 2

Understand corrections performed on data prior to delivery of the image to the end user.

SPECIFIC OUTCOME 3

Understand characteristics of sensors.

SPECIFIC OUTCOME 4

Understand the differences between sensor types.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 19

Show understanding of vector transformation principles

SAQA US ID	*UNIT STANDARD TITLE*
116822	Show understanding of vector transformation principles

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of basic transformation principles.

SPECIFIC OUTCOME 2

Apply basic transformation principles.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 20

Use geo-information output products

SAQA US ID	*UNIT STANDARD TITLE*
116833	Use geo-information output products

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	10

Specific Outcomes:

SPECIFIC OUTCOME 1

Define GIS concepts and terminology.

SPECIFIC OUTCOME 2

Describe the geo-information process from initial capture to final products.

SPECIFIC OUTCOME 3

Describe the capabilities and spatial operations of geo-information systems.

SPECIFIC OUTCOME 4

Use geo-information reports.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 21

Identify and select the appropriate map projection and carry out conversions between map projections for a specific project

SAQA US ID	*UNIT STANDARD TITLE*
116836	Identify and select the appropriate map projection and carry out conversions between map projections for a specific project

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 6	12

Specific Outcomes:

SPECIFIC OUTCOME 1

Display a knowledge and understanding of map projections.

SPECIFIC OUTCOME 2

Construct a graticule.