

DIPLOMA IN GEOMATICS

Dip (Geomatics) - NQF Level 6 (360 credits)

Qualification code: DPGM23

SAQA ID: 119112, CHE NUMBER: H/H16/E211CAN

Campus where offered:

Pretoria Campus

REMARKS

a. *Admission requirement(s) and selection criteria:*

• **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):

A Senior Certificate or an equivalent qualification, with C symbols at Standard Grade or D symbols at Higher Grade for English and Mathematics, and D symbols at Standard Grade or E symbols at Higher Grade for Physical Science.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23**.

• **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):

A National Senior Certificate or an equivalent qualification, with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics, and 3 for Physical Sciences or Technical Sciences.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (excluding Life Orientation).

• **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):

A National Certificate (Vocational) at NQF Level 4, with a bachelor's degree or a diploma endorsement, issued by the Council for Quality Assurance in General and Further Education and Training (Umalusi) with at least a 50% (APS of 4) for English, 50% for Life Orientation (excluded for APS calculation), and 50% (APS of 4) for Mathematics and Science, and 50% (APS of 4) for any other two compulsory vocational subjects.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (excluding Life Orientation).

• **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE/NATIONAL SENIOR CERTIFICATE AS PUBLISHED IN REPORT 191: N3 (NQF LEVEL 4):**

Admission requirement(s):

A National Senior Certificate or a National N Certificate with languages as published in Report 191: N3 (NQF Level 4) issued by both the Department of Higher Education (DHET) and the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% for English, Mathematics N3, Engineering Sciences N3 and any other two additional subjects.



Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (excluding Life Orientation).

Recommended subject(s):

None.

- **FOR PPLICANTS WITH AN N6 CERTIFICATE IN A RELATED ENGINEERING FIELD AS PUBLISHED IN REPORT 191: N4:**

Admission requirement(s):

An N6 Certificate in a related Engineering field as published in Report 191: N6 issued by both the Department of Higher Education and Training (DHET) and the Council for Quality Assurance in General and Further Education and Training (Umalusi), with an average of at least 60% for the qualification, and successful completion of an English Language Proficiency Assessment (done by the University).

- Assessment Procedure:*
No further assessment will be done (except for candidates with an N6 Certificate (see above)). Applicants who achieve the minimum APS will be considered until the programme complement is full. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.
- Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.
- Intake for the qualification:*
January only.
- Minimum duration:*
Three years.
- Presentation:*
Day classes.
- Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
COS105X	Communication Skills	(5)	(6)	
EGP105D	Engineering Surveying Fundamentals I	(5)	(28)	
GOA105X	Geomatics Computer Applications	(5)	(19)	
INL125C	Information Literacy (block module)	(5)	(1)	
LFS125X	Life Skills (block module)	(5)	(2)	

FIRST SEMESTER

MHA115D	Mathematics IA	(5)	(12)
PHG115D	Physics	(5)	(10)



GEG115X Geography (5) (6)

SECOND SEMESTER

GOP115D Geodesy and Map Projections (5) (12)

CSD115X Computer Survey Drawing (5) (12)

MHB115D Mathematics IB (5) (12) Mathematics IA

TOTAL CREDITS FOR THE FIRST YEAR: **108**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
APG206D	Applied Photogrammetry	(6)	(24)	
EGP206D	Engineering Surveying Fundamentals I	(6)	(24)	Engineering Surveying Fundamentals I
EST206D	Adjustment of Errors and Statistics	(6)	(24)	Engineering Surveying Fundamentals I Mathematics IB
GCP206D	Geomatics Control Project	(6)	(12)	Engineering Surveying Fundamentals I
GIT206D	Geographic Information Systems	(6)	(24)	Geomatics Computer Applications
RSS206D	Remote Sensing	(6)	(24)	

SECOND SEMESTER

CDF216D Cadastral Systems Fundamentals (6) (12)

TOTAL CREDITS FOR THE SECOND YEAR: **156**

THIRD YEAR

On completion of all modules.

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
WGM306D	Work-Integrated Learning: Geomatics	(6)	(120)	

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **384**

MODULE INFORMATION (OVERVIEW OF SYLLABUS)

The syllabus content is subject to change to accommodate industry changes. Please note that a more detailed syllabus is available at the Department or in the study guide that is applicable to a particular module. At time of publication, the syllabus content was defined as follows:

A

ADJUSTMENT OF ERRORS AND STATISTICS (EST206D) (Module custodian: Department of Geomatics)

1 X 3-HOUR PAPER

Introduction to Error Concept and Error Adjustment; Basic Statistical Concepts for Adjustment of Errors; Random Error theory and probability; Confidence Intervals; Hypothesis Testing; Regression Analysis and Correlation; Matrix Algebra; Error Propagation; Weights of Observations; Principles of Least Squares; Network Adjustment. (Total notional time: 240 hours)



APPLIED PHOTOGRAMMETRY (APG206D)**1 X 3-HOUR PAPER****(Module custodian: Department of Geomatics)**

The module covered in this module comprises of learning to understand and appreciate some fundamental and advanced concepts of digital Photogrammetry necessary for a study in Geomatics. Students will be exposed to theory, projects and practical assignment specially aligned to further strengthen their understanding of the concepts introduced. The module will further require that student integrate knowledge, theory and practical skills in other subjects offered through the first year level of qualification. (Total notional time: 240 hours)

C**CADASTRAL SYSTEMS FUNDAMENTALS (CDF216D)****1 X 3-HOUR PAPER****(Module custodian: Department of Geomatics)**

The module will comprise of the reviewing of the SA Property Law and tenure legislation. Registration of Geomaticians and the requirements by the Geomatics profession. The field work that gives rise to documents prepared for land right registration will be covered in this module, requirements and accuracies as well as the regulations governing survey work focusing on cadastral survey. The diagrams and Plans that are used for registration of land will be studied and practiced. (Total notional time: 120 hours)

COMMUNICATION SKILLS (COS105X)**1 X 2-HOUR PAPER****(Module custodian: Department of Chemical, Metallurgical and Material Engineering)**

The purpose of this module is to identify and apply basic competencies related to communicating in a technical or engineering environment. These competencies include presenting technical information to a variety of audiences, preparing technical reports, participating constructively in formal meetings and preparing a variety of business and technical documents. (Total notional time: 50 hours)

COMPUTER SURVEY DRAWING (CSD115X)**CONTINUOUS ASSESSMENT****(Module custodian: Department of Geomatics)**

Introduction to Drawing, Engineering Drawing Standards, Projections and Elevations, Manual Drafting and engineering surveying drawings, Cadastral and Topographical Mapping, Digital Design of Drawings, Introduction to Model maker, Introduction to Surpac, Digitizing Cadastral Plans. (Total notional time: 120 hours)

E**ENGINEERING SURVEYING FUNDAMENTALS I (EGP105D)****1 X 3-HOUR PAPER****(Module custodian: Department of Geomatics)**

Surveying Principles, Testing and Adjustment of levelling instrument, Levelling rise and fall, Levelling Long Section (HI Method), Levelling Cross Section, South African Co-ordinate System, Joins and Polars, Distance Correction, Traverse. (Total notional time: 280 hours)

ENGINEERING SURVEYING FUNDAMENTALS II (EGP206D)**1 X 3-HOUR PAPER****(Module custodian: Department of Geomatics)**

Instrument errors and adjustments including personal errors; Curves; Traversing; Triangulation; Spatial data; Deformation of structures; Precise Levelling. (Total notional time: 240 hours)

G**GEODESY AND MAP PROJECTIONS (GOP115D)****1 X 3-HOUR PAPER****(Module custodian: Department of Geomatics)**

Geographical Coordinates, Spherical trigonometry, Shape of the Earth, Geoid, mathematical representations of the Earth, (including datum's and reference ellipsoids), Map projections, Including mathematical models and projection characteristics), Two- and three-dimensional coordinate systems, SA Survey co-ordinate system and UTM system, Re-projections, transformations. (Total notional time: 120 hours)

GEOGRAPHY (GEG115X)**1 X 3-HOUR PAPER****(Module custodian: Department of Geomatics)**

Physical Geography, Human Geography, Disaster Management and Climate Change, Tourism, Understanding Maps. (Total notional time: 60 hours)



GEOGRAPHIC INFORMATION SYSTEMS (GIT206D)**1 X 3-HOUR PAPER****(Module custodian: Department of Geomatics)**

Maps; Map Designing; Cartometry; GIS Concepts and Components; GIS Data Collection; GIS Database/ Geo-Database; GIS Analysis and Modelling; GIS Applications; Visualisation and representation of geo-spatial information. (Total notional time: 240 hours)

GEOMATICS COMPUTER APPLICATIONS (GOA105X)**CONTINUOUS ASSESSMENT****(Module custodian: Department of Geomatics)**

Computer Hardware, Software, Introduction to Microsoft Office Suite, Data Communication, Virus and Antivirus, Internet Applications, Microsoft Excel for Surveying Computations, Design of web applications, Flowcharts of Algorithms, Programming for Geomatics Problem Solving, Databases, Entity Relationship Modelling, Microsoft Access for Database Design, SURPAC for Surveying Computations. (Total notional time: 190 hours)

GEOMATICS CONTROL PROJECT (GCP206D)**CONTINUOUS ASSESSMENT****(Module custodian: Department of Geomatics)**

The purpose of this module is to provide the student with skills in engineering surveying using a project-based approach. This module enables students to work on a survey project as they would in the industry, thus preparing them for application in the workplace. This module provides in depth practice of theories learnt and application of geomatics technologies. (Total notional time: 120 hours)

I**INFORMATION LITERACY (INL125C)****CONTINUOUS ASSESSMENT****(Module custodian: Directorate of Library and Information Services)**

Introduction of information literacy. Development of a search strategy and application of a search string to search engines and academic databases. Evaluation of information sources. Ethical and legal use of information. (Total notional time: 10 hours)

L**LIFE SKILLS (LFS125X)****CONTINUOUS ASSESSMENT****(Module custodian: Directorate of Student Development and Support)**

Personal, socio-emotional and academic skills development for students in higher education. This module includes: 1. Intra- and interpersonal skills (e.g. emotional intelligence, relationships, and conflict management); 2. General study skills (e.g. time management, goal setting, learning styles); 3. Health and wellness (e.g. HIV/AIDS, GBV issues, substance abuse); 4. Student life and adjustment (e.g. identity development, adjusting to a higher education environment); and 5. Financial management. (Total notional time: 20 hours)

M**MATHEMATICS IA (MHA115D)****1 X 3-HOUR PAPER****(Module custodian: Department of Mathematics and Statistics)**

The module is a basic introduction into calculus, as well as cognitive and conceptual tools, for implementation in other modules in the qualification and in the workplace. The focus will be on basic applications in engineering. (Total notional time: 120 hours)

MATHEMATICS IB (MHB115D)**1 X 3-HOUR PAPER****(Module custodian: Department of Mathematics and Statistics)**

This module provides the background in calculus, differential equations and numerical methods. (Total notional time: 120 hours)

P**PHYSICS (PHG115D)****1 X 3-HOUR PAPER****(Module custodian: Department of Physics)**

This module includes: Basic Mathematical Concepts for Physics and measurements; Mechanics (Forces and Newton's Laws of Motion, Friction, Dynamics of Circular Motion, Drag Forces, 1D, 2D and Rotational Kinematics); Thermodynamics (Temperature and Heat); Waves and Sound; Electric and magnetic fields and Forces; Electromagnetic Waves; Optics and Light. (Total notional time: 100 hours)



R**REMOTE SENSING (RSS206D)****1 X 3-HOUR PAPER****(Module custodian: Department of Geomatics)**

This module introduces the principles lying behind remote sensing, concentrating on space-borne platforms. The fundamentals of electro-magnetic (EM) radiation are explained, as are its interactions with Earth's surface and atmosphere. The module goes on to examine sensor characteristics, satellite orbits and various current and future missions involving a range of sensors across the visible, radar and microwave components of the spectrum. When dealing with images, the skills of image processing are used to extract meaning and interpretation from the spatial relationships of data, and the basics of image processing are also taught. The module includes a large number of examples of applications of remote sensing to environmental questions. (Total notional time: 240 hours)

W**WORK-INTEGRATED LEARNING: GEOMATICS (WGM306D)****WORK-INTEGRATED LEARNING****(Module custodian: Department of Geomatics)**

A practical module, that combines and applies knowledge gained from all theoretical modules in years one and two of the programme. The module will prepare the student for the working environment prior to graduation, will build their personal and professional ethics and enable students to be work ready. (Total notional time: 1200 hours)

