DIPLOMA IN GEOLOGY
Qualification code: DPGE19 - NQF Level 6 (372 credits)

SAQA ID: 100982, CHE NUMBER: H16/14272/HEQSF

Campus where offered: Arcadia Campus

REMARKS

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

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.

- **APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with a D symbol at Standard Grade or an E symbol at Higher Grade for English, Mathematics and Physical Science.

Recommended subject(s):
Geography.

Selection criteria:
Applicants who meet the minimum requirements will be invited to do an academic proficiency test. The applicants' performance in the Senior Certificate will contribute 80% to the final admission score and the academic proficiency test 20%. Applicants who pass the proficiency test will be shortlisted for selection by a departmental selection panel.

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

Admission requirement(s):
A National Senior Certificate 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 4 for Physical Sciences or Physical Sciences.

Recommended subject(s):
Computer Applications Technology, Geography and/or Information Technology.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).

Assessment procedures:
- Applicants with a score of 24 and more will be considered for admission.
- Applicants with a score of 21 to 23 will be invited to do an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test, will contribute 20%.

- **APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL):**

Admission requirement(s):
A National Certificate (Vocational) with a bachelor's degree or a diploma endorsement, with at least 50% for English (home language or first additional language) and 50% for Mathematics, 40% for Life Orientation (excluded for APS calculation), 50% for Sciences, and 50% 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 **21** (excluding Life Orientation).

Assessment procedures:
- Applicants with a score of 24 and more will be considered for admission.
- Applicants with a score of 21 to 23 will be invited to do an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test, will contribute 20%.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day classes.

e. *Minimum duration:*
Three years.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

g. *WIL in Geology I:*
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CAP105X	Communication for Academic Purposes	(5)	(10)	
CHM105X	Chemistry I	(5)	(24)	
CPL105X	Computer Literacy	(5)	(10)	
GMA105D	General Mathematics I	(5)	(24)	
GPH105D	General Physics I	(5)	(24)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LFI125X	Life Skills I (block module)	(5)	(2)	
FIRST SEMESTER				
ENT115D	Entrepreneurship I	(5)	(12)	
GEO115D	Geology I	(5)	(6)	
SECOND SEMESTER				
GMG115D	Geological Maps I	(5)	(6)	Geology I
MIG115D	Mineralogy	(5)	(6)	
STG115D	Stratigraphy	(5)	(6)	
TOTAL CREDITS FOR THE FIRST YEAR:			**132**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
EAG206D	Environmental Earth Sciences I	(6)	(12)	Geology I

ECG206D	Economic Geology	(6)	(20)	Mineralogy
ENG206D	Engineering Geology I	(6)	(20)	Mineralogy
GEP206D	Geophysics I	(6)	(20)	General Physics I Geology I

FIRST SEMESTER

GMG216D	Geological Maps II	(6)	(12)	Geological Maps I
SGG216D	Structural Geology	(6)	(12)	Geology I

SECOND SEMESTER

HYG216D	Hydrogeology I	(6)	(12)	Geology I
PEG216D	Petrology	(6)	(12)	Mineralogy

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

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
EAG316D	Environmental Earth Sciences II	(6)	(12)	Environmental Earth Sciences I Petrology
ENG316D	Engineering Geology II	(6)	(18)	Engineering Geology I
GEP316D	Geophysics II	(6)	(18)	Geophysics I
GIS316D	Geographic Information Systems and Remote Sensing	(6)	(12)	Geological Maps II Petrology
HYG316D	Hydrogeology II	(6)	(18)	Hydrogeology I
MEG316D	Mining and Exploration Geology	(6)	(18)	Economic Geology
SECOND SEMESTER				
WGD316D	WIL in Geology I	(6)	(24)	
WGD316R	WIL in Geology I (re-registration) (first-or second-semester module)	(6)	(0)	

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

TOTAL CREDITS FOR THE QUALIFICATION: **372**

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:

C

CHEMISTRY I (CHM105X) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

The role and importance of chemistry in everyday life. Classification and properties of matter. Units of measurement. Atoms, molecules and ions. The modern view of atomic structure and the use of electron configurations in chemical bonding. The periodic table of elements. The use of IUPAC rules for naming inorganic compounds. Application of the mole concept in stoichiometric calculations. Reactions in aqueous solutions. Chemical equilibrium. Fundamental concepts in electrochemistry. Organic nomenclature. (Total tuition time: ± 240 hours)

COMMUNICATION FOR ACADEMIC PURPOSES (CAP105X) **1 X 3-HOUR PAPER**

(Module custodian: Department of Applied Languages)

A workable knowledge of English is an essential skill for any graduate who is required to conduct themselves successfully in a professional working environment. This module will equip students with the competencies required to compose a selection of written texts related to communicating both internally and externally within a professional environment. In addition, the module includes strategies that are essential for the effective communication in various situations, including small groups to avoid unproductive conflict, a multicultural context, etc. (Total tuition time: not available)

COMPUTER LITERACY (CPL105X) **CONTINUOUS ASSESSMENT**

(Module custodian: End User Computing Unit)

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 tuition time: not available)

E

ECONOMIC GEOLOGY (ECG206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Principles of ore deposit geology. Kimberlitic diamonds and carbonatites. Magmatic ore deposits. Hydrothermal ore deposits. Pegmatitic ore deposits. Sedimentary Exhalative (SEDEX), Volcanogenic Massive Sulphides (VMS) and Skarn ore deposits. Sedimentary placer deposits. Residual sedimentary deposits. Supergene ore deposits. Plate tectonics and mineral deposits through geological time. (Total tuition time: ± 200 hours)

ENGINEERING GEOLOGY I (ENG206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to Engineering geology. Site (ground) investigation. Building foundations. Dams and reservoirs (Total tuition time: ± 200 hours)

ENGINEERING GEOLOGY II (ENG316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Investigation of dam wall area and foundations. Rock cycles and processes. Types of rocks. Rock in construction. Geological structures. (Total tuition time: ± 180 hours)

ENTREPRENEURSHIP I (ENT115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Management and Entrepreneurship)

Students will acquire knowledge, skills and competence in various types of businesses, management functions, budgeting, accounting, administration, banking, personnel management, customer relations and entrepreneurship including drafting a business plan. These skills will assist entrepreneurs in successfully starting and running a business. (Total tuition time: ± 240 hours)

ENVIRONMENTAL EARTH SCIENCES I (EAG206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Environment and sustainable development. Human population growth. Anthropogenic climate change. Air pollution. Water and land pollution. Environmental pollution law in SA. Geology and biodiversity: changes over Earth's history. Geology and biodiversity: making the links. Habitat fragmentation and habitat loss as an environmental problem. Biodiversity law in SA. Regulating the environmental impacts of prospecting and mining. Environmental management systems. Environmental Impact Assessments. (Total tuition time: ± 120 hours)

ENVIRONMENTAL EARTH SCIENCES II (EAG316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

General Petrology. Pyroclastic Rocks and their Classification. The Contribution of Volcanic eruptions to Atmospheric Chemistry. Thermodynamic equilibria. Mineral speciation. Geochemistry of Continental Solids. Chemistry of Continental Waters. Chemistry of Oceanic Waters. (Total tuition time: ± 120 hours)

G

GENERAL MATHEMATICS I (GMA105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Do numerical computations. Apply knowledge of mensuration to calculate perimeters, areas and volumes of two- and three-dimensional objects. Apply knowledge of functions and equations to solve well-defined problems. Use basic calculus rules to solve well-defined problems. Use Excel to organise given data in charts and calculate descriptive measures. Do basic regression analysis and curve fitting using Excel and a scientific calculator; and Implement basic probability theories to predict outcomes of events. (Total tuition time: ± 120 hours)

GENERAL PHYSICS I (GPH105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Basic mathematical concepts for physics and measurements. Motion in one dimension. Motion in a plane (projectile motion). Forces and Newton's Law of Motion. Equilibrium condition and torque. Work, energy and power. Linear momentum and impulse. Properties of static and dynamic fluids. Temperature and heat. Heat transfer. General properties of waves. Reflection. Refraction. Electrostatics. Electric circuits. Basic nuclear physics. (Total tuition time: not available)

GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING (GIS316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to GIS. Spatial data models. Spatial data structures. Spatial data input. Visualisation and query of spatial data. Spatial data transformations. Tools for map analysis: Single map. Tools for map analysis: Map pairs. Tools for map analysis: Multiple maps. (Total tuition time: ± 120 hours)

GEOLOGICAL MAPS I (GMG115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to map work. Map scales. Topographic profiles. Geological Sections. Geological Traverse and mapping. (Total tuition time: ± 60 hours)

GEOLOGICAL MAPS II (GMG216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to map work. Map scales. Topographic profiles. Geological Sections. Geological Traverse and mapping. Drilling methods. Introduction to structure contours. True dip of a plane, strike of a plane and apparent dip of a plane. Geological sections. Vertical thickness and true thickness. Geological Structures. Three point problems. (Total tuition time: ± 120 hours)

GEOLOGY I (GEO115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Solar system, gravity and the earth. Continental drift theory. Structure of the earth. Divergent plate boundaries. Convergent plate boundaries. Transform plate boundary. Definition of a mineral and chemical properties of minerals. Mineral habit and crystal forms of minerals. The six mineral crystallographic axes. Physical properties of minerals. Identifying minerals in hand specimen. (Total tuition time: ± 60 hours)

GEOPHYSICS I (GEP206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to Geophysics. Physical properties. Introduction to Geophysical methods. Gravity method. Magnetic method. (Total tuition time: ± 200 hours)

GEOPHYSICS II (GEP316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Application of resistivity into the resistivity method and data acquisition using a resistivity survey. Application of seismic velocity into the refraction seismic method and data acquisition using a refraction seismic survey. (Total tuition time: ± 180 hours)

H

HYDROGEOLOGY I (HYG216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to hydrology and hydrogeology. Energy transformations and the hydrologic cycle. Elements of the hydrogeologic cycle. Stream hydrographs. Baseflow and groundwater recharge. Porosity and earth materials. (Total tuition time: ± 120 hours)

HYDROGEOLOGY II (HYG316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Groundwater flow to wells. Soil moisture and groundwater recharge. Regional groundwater flow. Geology of groundwater occurrence. Basic water chemistry. Water quality and groundwater contamination. Groundwater development and management. (Total tuition time: ± 180 hours)

I

INFORMATION LITERACY I (INI125D) **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 tuition time: not available)

L

LIFE SKILLS I (LFI125X) **CONTINUOUS ASSESSMENT**

(Module custodian: Directorate of Student Development and Support)

Academic, personal and socio-emotional skills development for students in higher education. Personal and social dimensions address: effective planning and self-management (goal setting and time management); Adjusting to university life (student life, diversity and change); Intra- and interpersonal skills development (conflict management, self-esteem, relationship management); Effective living (healthy living, HIV education, substance abuse); Academic dimension addresses: academic skills for university (e.g. critical thinking, creativity, managing assignments and assessments). (Total tuition time: not available)

M

MINERALOGY (MIG115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to Mineralogy and Physical Properties of Mineral. Atoms and Chemical Bonding. The Formation of Crystalline Solids. Morphology of Crystals. Berzelian Classification of minerals. Native Elements and Sulphides. Oxides, Hydroxides and Halides. Carbonate minerals. Sulphates, Phosphates, Vanadates, Tungstates and Molybdates. Neso- and Sorosilicates. Cyclo- and Inosilicates. Phyllosilicates. Tectosilicates. Mineraloids. (Total tuition time: ± 60 hours)

MINING AND EXPLORATION GEOLOGY (MEG316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Mineral area selection. Mineral deposit models. Exploration design and strategy. Mineral Exploration Case Studies 1. Mineral Exploration Case Studies 2. (Total tuition time: ± 180 hours)

P

PETROLOGY (PEG216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to igneous petrology. Classification of igneous rocks. Igneous rocks textures and structures. Volcanic rocks in South Africa. Igneous rocks hand specimen identification and fieldwork. Metamorphic petrology. Contact metamorphism. Regional metamorphism. Organically formed sedimentary rocks. Summary of Petrology course. (Total tuition time: ± 120 hours)

S

STRATIGRAPHY (STG115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Principles of stratigraphy. Introduction to the South African Stratigraphy. Archaean Intrusions. Pongola Supergroup. Dominion Group and Witwatersrand Supergroup. Ventersdorp Supergroup and the Limpopo Belt. Transvaal Supergroup. Bushveld Igneous Complex and Rooiberg Group. Alkaline Complexes (Phalaborwa, Schiel and Pilanesberg). Soutpansberg, Waterberg Groups and Olifantshoek Supergroup. Namaqua-Natal Province. Cape Granite Suite and Cape Supergroup. Sedimentary and Igneous Karoo. Gondwana Break-up and Mesozoic and Cenozoic deposits (on- and offshore). Impact Structures, Kimberlites, Karsts and caves.
(Total tuition time: ± 60 hours)

STRUCTURAL GEOLOGY (SGG216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to the nature of structural geology. Introduction to geologic structures - their classification. Displacement and strain. Force and stress in rocks and strength of rocks. Deformation mechanisms. Joints. Faults and faulting. Folds and folding. Fault-fold interactions. Foliation and lineation. Shear zones and progressive deformation. Tectonism and active tectonics. Geologic mapping. (Total tuition time: ± 120 hours)

W

WIL IN GEOLOGY I (WGD316D/R) **WORK-INTEGRATED LEARNING**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to WIL (WDTL): WIL unpacked (purpose, outcomes, procedures-timeframe etc.) Roles and responsibilities (TUT staff, students, institutions). Action learning (observation, problem-solving, action plans, Reflection practices). Development of applied competencies (PJBL and WBL): Producing and Communicating Information. Problem-solving. Geological report writing. (Total tuition time: ± 240 hours)