

NATIONAL DIPLOMA: GEOLOGY
(Extended curriculum programme with foundation provision)
Qualification code: NDGEF0 - NQF Level 6

Campus where offered: Arcadia Campus

Important notification to new applicants:

Students who intend to enrol for this qualification for the first time in 2017 or thereafter, should note that it will not be possible to continue with any Baccalaureus Technologiae as from 2020, since it is being replaced by qualifications aligned with the newly-implemented Higher Education Qualification Sub-Framework. Potential students are advised to consult the University's website for any new qualifications which might not be published in this Prospectus.

REMARKS

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

• **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE 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 these minimum requirements will be invited to write an academic proficiency test. The applicant's 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 short listed for selection by a departmental selection panel.

• **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE 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 and 4 for Physical Sciences.

Recommended subject(s):

Computer Applications Technology, Geography and Information Technology.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21**. Applicants will be selected by a departmental selection panel and shortlisted for selection.

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 write an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test will contribute 20%.

b. *Minimum duration:*

Three and a half years.

c. *Presentation:*

Day classes.



- d. *Intake for the qualification:*
January only.
- e. *Exclusion and readmission, practicals, textbooks, personal protective equipment, projects and assignments, Recognition of Prior Learning (RPL), equivalence, status and Industrial Geology (Work-Integrated Learning):*
See National Diploma: Geology (NDGE04).
- f. *Subject credits:*
Subject credits are shown in brackets after each subject.
- Key to asterisks:
* Information does not correspond to information on AA72.
(Deviation approved by the Senate in September 2015.)

CURRICULUM

FIRST YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
FPCHE04	Chemistry IA: Extended	(0,165)	
FPMAT06	Mathematics I: Extended	(0,120)	
FPFHU05	Physics IA: Extended	(0,165)	

FIRST SEMESTER

FPENG05	Foundation English	(0,075)	
GEO151T	Geology I	(0,100)	

SECOND SEMESTER

CSK101B	Computer Skills I	(0,050)	
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TOTAL CREDITS FOR THE FIRST YEAR: **0,675**

SECOND YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
AGL111T	Applied Geology I	(0,100)	Geology I
GET111T	Geotechniques I	(0,100)	Geology I
MRL101T	Mineralogy I	(0,100)	Chemistry IA: Extended Geology I
SGE101T	Structural Geology I	(0,100)	Geology I

TOTAL CREDITS FOR THE SEMESTER: 0,400

SECOND SEMESTER

AGL211T	Applied Geology II	(0,150)	Applied Geology I
GET211T	Geotechniques II	(0,150)	Geotechniques I
GPH211T	Geophysics II	(0,150)	Physics IA: Extended
SGG201T	Structural Geology II	(0,150)	Structural Geology I

TOTAL CREDITS FOR THE SEMESTER: 0,600

TOTAL CREDITS FOR THE SECOND YEAR: **1,000**



THIRD YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
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FIRST SEMESTER

GPH311T	Geophysics III	(0,150)	Geophysics II
PET211T	Petrology II	(0,150)	Mineralogy I
STA111B	Statistics I	(0,075)	Mathematics I: Extended

plus one of the following subjects:

EPS131T	Entrepreneurial Skills I	(0,075)	
MAT271T	Mathematics II	(0,075)	Mathematics I: Extended

TOTAL CREDITS FOR THE SEMESTER: 0,450

SECOND SEMESTER

ENG301T	Engineering Geology III	(0,150)	Applied Geology II Petrology II Structural Geology II
HGE301T	Hydrogeology III	(0,150)	Applied Geology II Structural Geology II
MEG301T	Mining and Exploration Geology III	(0,150)	Geotechniques II Petrology II Statistics I

TOTAL CREDITS FOR THE SEMESTER: 0,450

TOTAL CREDITS FOR THE THIRD YEAR: **0,900**

FOURTH YEAR

On completion of the above subjects. If a student has one subject outstanding such a case will be reviewed and permission might be granted in collaboration with a specific employer.

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
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FIRST OR SECOND SEMESTER

EXP1GEO	Work-Integrated Learning I*	(0,425)	
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TOTAL CREDITS FOR THE FOURTH YEAR: **0,425**

TOTAL CREDITS FOR THE QUALIFICATION: **3,000**

SUBJECT/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 subject/module. On 01 August 2017, the syllabus content was defined as follows:

A**APPLIED GEOLOGY I (AGL111T)****1 X 3-HOUR PAPER***(Subject custodian: Department of Environmental, Water and Earth Sciences)*

Introductory geophysics. Introductory hydrogeology. Introductory engineering geology. (Total tuition time: ± 60 hours)



APPLIED GEOLOGY II (AGL211T)**1 X 3-HOUR PAPER****(Subject custodian: Department of Environmental, Water and Earth Sciences)**

South African stratigraphy and mineral deposits. (Total tuition time: ± 68 hours)

C**CHEMISTRY IA: EXTENDED (FPCHE04)****1 X 3-HOUR PAPER****(Subject custodian: Department of Chemistry)**

Scientific methodology and its use in discovering chemistry. Numbers in chemistry. The use of SI units. Matter. Atomic structure. Compounds in chemistry. The mole concept and chemical calculations. The electronic structure of the atom and electronic configurations within the periodic table. Chemical bonding. The states of matter and the binding forces within matter. Basic concepts of the gas laws. Solutions in chemistry. Acids, bases and salts. Oxidation and reduction and the balancing of equations. Introduction to organic compounds (nomenclature and functional groups). (Total tuition time: ± 192 hours)

COMPUTER SKILLS I (CSK101B)**CONTINUOUS ASSESSMENT****(Subject/Module custodian: End User Computing Unit)**

Students have to acquire theoretical knowledge (computing fundamentals) and practical skills as an end-user in operating systems and MS Office Suite applications (MS Word, MS Excel and MS PowerPoint) on an introductory level. Students will do online and computer based tests. The modules are mapped with SAQA and IC3 Essential Skills for Digital Literacy (international certification). (Total tuition time: ± 40 hours)

E**ENGINEERING GEOLOGY III (ENG301T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Environmental, Water and Earth Sciences)**

Rock material and rock mass, engineering geology of soils, introduction to rock mechanics, introduction to soil mechanics, engineering-geological investigation methods, the engineering geology of South African rock types. (Total tuition time: ± 77 hours)

ENTREPRENEURIAL SKILLS I (EPS131T)**1 X 3-HOUR PAPER****(Subject custodian: Department of Management and Entrepreneurship)**

Types of businesses. Management functions. Planning, organising, leading, control. Budgeting. Accounting. Administration. Banking. Personnel management. Customer relations. (Total tuition time: not available)

F**FOUNDATION ENGLISH (FPENG05)****1 X 3-HOUR PAPER****(Subject custodian: Department of Applied Languages)**

Interpret, relate and reflect on all available and relevant resource material in proper English. Communicate orally in a comprehensible and clear manner in both general and subject-specific communication. Demonstrate intermediate-level of proficiency in written English. (Total tuition time: ± 160 hours)

G**GEOLOGY I (GEO151T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Environmental, Water and Earth Sciences)**

Introduction to earth sciences. Physical geology. Geomorphology. Pedology. Introduction to environmental geology. (Total tuition time: ± 120 hours)

GEOPHYSICS II (GPH211T)**1 X 3-HOUR PAPER****(Subject custodian: Department of Environmental, Water and Earth Sciences)**

The use of electrical resistivity, gravitation, the radiometric and electromagnetic methods in exploration and engineering geology. (Total tuition time: ± 156 hours)

GEOPHYSICS III (GPH311T)**1 X 3-HOUR PAPER****(Subject custodian: Department of Environmental, Water and Earth Sciences)**

The use of borehole geophysics, induced polarisation methods and seismic methods in exploration and engineering geology. (Total tuition time: ± 180 hours)



GEOTECHNIQUES I (GET111T) 1 X 3-HOUR PAPER

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

Maps, map projections and map scales, South African map series, compilation of geological profiles, compass mapping and field mapping. (Total tuition time: ± 60 hours)

GEOTECHNIQUES II (GET211T) 1 X 3-HOUR PAPER

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

The solving of three-dimensional structural problems, photogeology, field mapping with aerial photography, field mapping of intrusive and metamorphic rocks, the identification of minerals and rocks. (Total tuition time: ± 60 hours)

H

HYDROGEOLOGY III (HGE301T) 1 X 3-HOUR PAPER

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

Occurrence and movement of groundwater. Borehole construction. Testing. Hydrochemistry. (Total tuition time: ± 60 hours)

M

MATHEMATICS I: EXTENDED (FPMAT06) 1 X 3-HOUR PAPER

(Subject custodian: Department of Mathematics and Statistics)

Basic mathematics. Differentiation. Integration. Matrices. (Total tuition time: ± 120 hours)

MATHEMATICS II (MAT271T) 1 X 3-HOUR PAPER

(Subject/Module custodian: Department of Mathematics and Statistics)

Differentiation: logarithmic differentiation, implicit functions, the inverse trigonometric functions, the hyperbolic functions, parametric functions, applications. Partial differentiation: first-order partial derivatives, small increments, rates of change, changing of the variables, errors. Integration: fundamental integration formulae, factor integration, partial fractions, hyperbolic functions, standard forms, applications. First-order differential equations: introduction and definitions, direct integration, separation of variables, exact equations, linear equations, Bernoulli's equation, applications. (Total tuition time: ± 120 hours)

MINERALOGY I (MRL101T) 1 X 3-HOUR PAPER

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

Crystallography. Crystal chemistry, crystal physics and crystal optics. Systematic and descriptive mineralogy. Practical. (Total tuition time: ± 60 hours)

MINING AND EXPLORATION GEOLOGY III (MEG301T) 1 X 3-HOUR PAPER

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

Terrestrial natural resources, ore petrology, economic geology of South African ore occurrences, mining and exploration geology. Remote sensing and GIS. (Total tuition time: ± 60 hours)

P

PETROLOGY II (PET211T) 1 X 3-HOUR PAPER

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

Igneous petrology. Metamorphic petrology. Sedimentary petrology. Practical. (Total tuition time: ± 120 hours)

PHYSICS IA: EXTENDED (FPPHU05) 1 X 3-HOUR PAPER

(Subject custodian: Department of Physics)

Basic mathematics for physics. Introduction to calculus-based physics. Measurements. Kinematics in 1D and 2D. Newton's laws of motion. Dynamics of uniform circular motion. Work energy and power. Impulse and momentum. Rotational kinematics and dynamics. Fluids, temperature and heat. The ideal gas law and kinetic theory. Electric forces and fields. Electric potential energy and the electric potential. Electric circuits. Reflection of light: mirrors, lenses and optical instruments. Practical experiments related to the theory with emphasis on measuring physical quantities. (Total tuition time: ± 160 hours)



S**STATISTICS I (STA111B)****1 X 3-HOUR PAPER****(Subject custodian: Department of Mathematics and Statistics)**

Introduction. Presentation of data. Statistical measures of position. Statistical measures of distribution. Moments and measures of asymmetry and kurtosis. Linear correlation and regression. Probability theory. (Total tuition time: not available)

STRUCTURAL GEOLOGY I (SGE101T)**1 X 3-HOUR PAPER****(Subject custodian: Department of Environmental, Water and Earth Sciences)**

Geological structures. Deformational processes. Practical. (Total tuition time: ± 60 hours)

STRUCTURAL GEOLOGY II (SGG201T)**1 X 3-HOUR PAPER****(Subject custodian: Department of Environmental, Water and Earth Sciences)**

Deformation process. (Total tuition time: ± 68 hours)

W**WORK-INTEGRATED LEARNING I (EXP1GEO)****WORK-INTEGRATED LEARNING****(Subject custodian: Department of Environmental, Water and Earth Sciences)**

Syllabus content not available. Please contact the Head of the Department.

