

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

Campus where offered: Arcadia Campus (day classes)
Last year of new intake: 2018
Teach-out (phase-out) date: 31 December 2022

Students registered for this qualification should complete their studies according to the teach-out date prescribed for the qualification, subject to the stipulations of Regulation 3.1.11 and 3.1.13 in the Students' Rules and Regulations.

Information on phased-out programmes can be obtained from the TUT website, www.tut.ac.za.

Key to asterisks:

* Information does not correspond to information on AA72.
(Deviations approved Senate in September 2015.)

CURRICULUM

Consult the 2018 Faculty Prospectus for the full contents of the qualification.

FIRST YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
FPCHE04	Chemistry IA: Extended	(0,165)	
FPMAT06	Mathematics I: Extended	(0,120)	
FPPHU05	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)
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FIRST SEMESTER

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
GP211T	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)
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)
FIRST OR SECOND SEMESTER			
EXP1GEO	Work-Integrated Learning I*	(0,425)	
TOTAL CREDITS FOR THE FOURTH YEAR:		0,425	
TOTAL CREDITS FOR THE QUALIFICATION:		3,000	

SUBJECT 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. At time of publication, 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 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: ± 104 hours for GEO141T and ± 120 hours for GEO151T)

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 custodian: Department of Mathematics and Statistics)

Differentiation: logarithmic differentiation, implicit functions, the inverse of 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.

