



University of Pretoria Yearbook 2022

BScHons *Engineering and Environmental Geology - Hydrogeology* (02240376)

Department Geology

Minimum duration of study 1 year

Total credits 135

NQF level 08

Admission requirements

1. BSc (Geology) degree (or equivalent) **or** BSc (Engineering and Environmental Geology) degree (or equivalent) **or** relevant bachelor's degree
2. A weighted average of at least 60% in an undergraduate geology programme and another fundamental science at second-year and third-year level (i.e. Maths, Chemistry, Physics and Mechanics)



Curriculum: Final year

Minimum credits: 135

Core credits: 135

Core modules

Site investigation project 713 (GTX 713)

Module credits	30.00
NQF Level	08
Prerequisites	No prerequisites.
Contact time	5 practicals per week (8 weeks)
Language of tuition	Module is presented in English
Department	Geology
Period of presentation	Year

Module content

Field work which includes mapping, soil and rock description, joint surveys, borehole testing, water sampling, interpretation of laboratory test results and compilation of site investigation reports. Larger projects of at least two months of fieldwork and report writing which involves surface and underground studies, mapping, drill core logging, discontinuity surveys, rock mass classification, stability analyses, interpretation of laboratory tests or pollution studies including water and/or soil sampling, interpretation of laboratory tests, development of a rehabilitation plan or groundwater model and compilation of a report. Compulsory attendance at conferences, short courses, specialist lectures, visits to construction sites and fields excursions.

Engineering geology of South Africa 714 (GTX 714)

Module credits	20.00
NQF Level	08
Prerequisites	No prerequisites.
Contact time	2 practicals per week (5 weeks), 4 lectures per week (5 weeks)
Language of tuition	Module is presented in English
Department	Geology
Period of presentation	Year

Module content

Overview of site investigation phases; site investigation techniques; soil profiling and rock core description. Literature study and compilation of reports on the stratigraphy of South African rock types and engineering problems of rocks and soils within different stratigraphic units and climatic regions.



Environmental geochemistry 715 (GTX 715)

Module credits	20.00
NQF Level	08
Prerequisites	No prerequisites.
Contact time	2 practicals per week (5 weeks), 4 lectures per week (5 weeks)
Language of tuition	Module is presented in English
Department	Geology
Period of presentation	Year

Module content

Principles of low temperature geochemistry; geochemistry and origin of acid mine water; acid-mineral reactions; industrial effluents, remediation methods, waste disposal, environmental sampling and data analysis; geochemical modelling.

Environmental management and risk assessment 716 (GTX 716)

Module credits	20.00
NQF Level	08
Prerequisites	No prerequisites.
Contact time	2 practicals per week (3 weeks), 4 lectures per week
Language of tuition	Module is presented in English
Department	Geology
Period of presentation	Year

Module content

Principles of integrated environmental management; environmental impact assessment; environmental management systems (ISO 14000 series); water resource management; environmental legislation; site investigation guidelines; natural hazard risk assessment; seismicity; project management and professional business practice. Geological models and software.

Hydrogeological modelling 718 (GTX 718)

Module credits	20.00
NQF Level	08
Prerequisites	No prerequisites.
Contact time	2 practicals per week (5 weeks), 4 lectures per week (5 weeks)
Language of tuition	Module is presented in English
Department	Geology
Period of presentation	Year



Module content

Groundwater hydraulics and contaminant transport; finite-difference methods; flow and transport equations; spatial and temporal discretisation, stability criteria; development of conceptual models; introduction to appropriate flow and/or transport modelling software.

Fluid mechanics in geological media 725 (GTX 725)

Module credits 20.00

NQF Level 08

Prerequisites No prerequisites.

Contact time 2 practicals per week (5 weeks), 4 lectures per week (5 weeks)

Language of tuition Module is presented in English

Department Geology

Period of presentation Year

Module content

Water cycle and distribution of water in the Earth's crust. Single phase flow and multiphase flow; saturated and unsaturated flow. Flow through porous and fractured media. Quantification of hydrological parameters. South African hydrostratigraphy. Drainage and dewatering.

Applied geological field methods 728 (GTX 728)

Module credits 10.00

NQF Level 08

Prerequisites No prerequisites.

Contact time 5 practicals per week (2 weeks)

Language of tuition Module is presented in English

Department Geology

Period of presentation Year

Module content

Practical field-based investigation methods for engineering geological and hydrogeological application; geological mapping.

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be accepted as an excuse for any transgression, or basis for an exception to any of the aforementioned regulations.