

## University of Pretoria Yearbook 2024

### 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)

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

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

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

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

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

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

<b>Module credits</b>	10.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	5 practicals per week (2 weeks)
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Geology
<b>Period of presentation</b>	Year

### Module content

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

## General Academic Regulations and Student Rules

The [General Academic Regulations \(G Regulations\)](#) and [General Student Rules](#) apply to all faculties and registered students of the University, as well as all prospective students who have accepted an offer of a place at the University of Pretoria. On registering for a programme, the student bears the responsibility of ensuring that they familiarise themselves with the General Academic Regulations applicable to their registration, as well as the relevant faculty-specific and programme-specific regulations and information as stipulated in the relevant yearbook. Ignorance concerning these regulations will not be accepted as an excuse for any transgression, or

basis for an exception to any of the aforementioned regulations. The G Regulations are updated annually and may be amended after the publication of this information.

#### **Regulations, degree requirements and information**

The faculty regulations, information on and requirements for the degrees published here are subject to change and may be amended after the publication of this information.

#### **University of Pretoria Programme Qualification Mix (PQM) verification project**

The higher education sector has undergone an extensive alignment to the Higher Education Qualification Sub-Framework (HEQSF) across all institutions in South Africa. In order to comply with the HEQSF, all institutions are legally required to participate in a national initiative led by regulatory bodies such as the Department of Higher Education and Training (DHET), the Council on Higher Education (CHE), and the South African Qualifications Authority (SAQA). The University of Pretoria is presently engaged in an ongoing effort to align its qualifications and programmes with the HEQSF criteria. Current and prospective students should take note that changes to UP qualification and programme names, may occur as a result of the HEQSF initiative. Students are advised to contact their faculties if they have any questions.