# University of Pretoria Yearbook 2017

# BScHons Geology (02240142)

| | |
|---|---|
| **Duration of study** | 1 year |
| **Total credits** | 135 |

## Programme information

**Renewal of registration**

i. Subject to exceptions approved by the Dean, on the recommendation of the head of department, and in the case of distance education where the Dean formulates the stipulations that will apply, a student may not sit for an examination for the honours degree more than twice in the same module.
ii. A student for an honours degree must complete his or her study, in the case of full-time students, within two years and, in the case of after-hours students, within three years of first registering for the degree and, in the case of distance education students, within the period stipulated by the Dean. Under special circumstances, the Dean, on the recommendation of the head of department, may give approval for a limited extension of this period.

In calculating marks, General Regulation G.12.2 applies.

Apart from the prescribed coursework, a research project is an integral part of the study.

## Admission requirements

A BSc degree in Geology with an average of 60% for all the geology modules at third-year level. In the selection procedure the candidate's complete undergraduate academic record will be considered. The positions available are limited to 25 and candidates who have progressed faster through their undergraduate degree will take preference. Outside applicants and those with unusual degree structures may be admitted after perusal of their academic records and at the discretion of the head of department.

## Pass with distinction

The BScHons degree is awarded with distinction to a candidate who obtains a weighted average of at least 75% in all the prescribed modules and a minimum of 65% in any one module.

# Curriculum: Final year

**Minimum credits: 135**

**Minimum credits:  135**

## Core modules

### Volcanology 702 (GLY 702)

| | |
|---|---|
| **Module credits** | 12.00 |
| **Prerequisites** | No prerequisites. |
| **Contact time** | 2 lectures per week, 2 practicals per week |
| **Language of tuition** | Module is presented in English |
| **Academic organisation** | Geology |
| **Period of presentation** | Year |

**Module content**

This module traces the path of magmas from their ultimate source in the mantle, storage and evolution in the crust, through eruption at the surface where they interact with the landscape and atmosphere. Volcanic eruptions and the transfer of mass and volatiles from the deep interior of the planet. Transformation of the landscape by violent eruptions, and impact on the atmosphere on short timescales. An integrated history of magmatism and its central role in the production of the crust and the degassing history of the planet. The fluid dynamics of volcanoes, from viscous magma flows to turbulent, multiphase eruptions.

### Geophysics and basin analysis 703 (GLY 703)

| | |
|---|---|
| **Module credits** | 16.00 |
| **Prerequisites** | No prerequisites. |
| **Contact time** | 5 practical sessions per week, 5 lectures per week |
| **Language of tuition** | Module is presented in English |
| **Academic organisation** | Geology |
| **Period of presentation** | Year |

**Module content**

Physical properties of rocks and minerals: porosity and permeability; density; magnetic properties; natural radioactivity; elastic properties; seismic wave attenuation; thermal properties; electrical properties. Basic principles and applications of various geophysical techniques: gravity, magnetic, resistivity, electromagnetic, seismic and radiometric techniques. Principles of basin analysis; controls on sea level change; subsurface analytical methods; basin mapping methods; subsidence analysis (decompaction and sediment loading, subsidence curves); sequence stratigraphy; sedimentation systems in different basin types; Precambrian basins.

### Crustal evolution 704 (GLY 704)

| | |
|---|---|
| **Module credits** | 12.00 |

| | |
|---|---|
| **Prerequisites** | No prerequisites. |
| **Contact time** | 2 lectures per week, 2 practicals per week |
| **Language of tuition** | Module is presented in English |
| **Academic organisation** | Geology |
| **Period of presentation** | Year |

**Module content**

Precambrian crustal evolution. Precambrian plate tectonics. Precambrian evolution of the African plate (Eburnean, Kibaran and Pan-African events). Phanerozoic evolution to the African plate; global examples of tectonics as a continental crustal source. Determination of deformational history of crustal rocks; determination of palaeostress conditions in ancient crustal rocks. Practical experience of structural analysis and determination of deformational history.

## Ore deposits and mining methods 706 (GLY 706)

| | |
|---|---|
| **Module credits** | 16.00 |
| **Prerequisites** | No prerequisites. |
| **Contact time** | 2 practicals per week, 2 lectures per week |
| **Language of tuition** | Module is presented in English |
| **Academic organisation** | Geology |
| **Period of presentation** | Year |

**Module content**

Systematic review of major metallic and non-metallic ore types and examples in South Africa and world-wide; ore type models (geometry, size, geodynamic setting, grade, chemistry/mineralogy). Controlling legislation and infrastructural requirements for mining. . Mining methods: open cast and underground. Metallurgical treatment, metallurgical plants and waste disposal. Pollution, acid drainage and acid rain.

## Mapping camp 707 (GLY 707)

| | |
|---|---|
| **Module credits** | 9.00 |
| **Prerequisites** | No prerequisites. |
| **Contact time** | 2 practicals per week |
| **Language of tuition** | Module is presented in English |
| **Academic organisation** | Geology |
| **Period of presentation** | Year |

**Module content**

Mapping and analysis of a geologically complex area using different techniques.

## Honours project 710 (GLY 710)

| | |
|---|---|
| **Module credits** | 30.00 |

| | |
|---|---|
| **Prerequisites** | No prerequisites. |
| **Contact time** | 5 practical sessions per week |
| **Language of tuition** | Module is presented in English |
| **Academic organisation** | Geology |
| **Period of presentation** | Year |

**Module content**

Independent acquisition of geological field and/or laboratory data, treatment and interpretation thereof, and writing of an honours essay.

## Igneous petrology and geochemistry 711 (GLY 711)

| | |
|---|---|
| **Module credits** | 12.00 |
| **Prerequisites** | No prerequisites. |
| **Contact time** | 2 practicals per week, 2 lectures per week |
| **Language of tuition** | Module is presented in English |
| **Academic organisation** | Geology |
| **Period of presentation** | Year |

**Module content**

Interpretation and application of advanced petrogenetic tools: the Rb/Sr and Sm/Ndisotopic systems, quantitative interpretation of binary and ternary phase diagrams, assimilation-fractional crystallisation – partial melting. Abundance of elements in the crust, crust-forming models. Hydrous geochemistry. Recognition of geochemical anomalies. Analytical methods and the treatment of geochemical data.

## Metamorphic petrology and geochemistry 712 (GLY 712)

| | |
|---|---|
| **Module credits** | 12.00 |
| **Prerequisites** | No prerequisites. |
| **Contact time** | 2 practicals per week, 2 lectures per week |
| **Language of tuition** | Module is presented in English |
| **Academic organisation** | Geology |
| **Period of presentation** | Year |

**Module content**

Geothermometers and geobarometers, PT-t loops. Studies of major African and other mobile belts: Limpopo, Natal-Namaqua, Pan-African and Hoggar.

## Economic geology 713 (GLY 713)

| | |
|---|---|
| **Module credits** | 16.00 |
| **Prerequisites** | No prerequisites. |
| **Contact time** | 2 practicals per week, 2 lectures per week |

| | |
|---|---|
| **Language of tuition** | Module is presented in English |
| **Academic organisation** | Geology |
| **Period of presentation** | Year |

**Module content**

Basic remote sensing methods and their applications to geology;  basic geophysical and geochemical exploration techniques;  exploration target generation - philosophies and methods;  professional geological practice;  the SAMREC and similar codes; geologists in the business environment; case studies. Practical component (runs parallel to theory above) encompasses ore-microscopy; ore mineral identification; ore textures; analysis of ore assemblages; instrumental techniques applied to ores.

The information published here is subject to change and may be amended after the publication of this information. The General Regulations (G Regulations) apply to all faculties of the University of Pretoria. It is expected of students to familiarise themselves well with these regulations as well as with the information contained in the General Rules section. Ignorance concerning these regulations and rules will not be accepted as an excuse for any transgression.