

GEOLOGY

Associate Professor & Head of Department

SA Prevec, PhD(U Alberta)

Professor of Exploration Geology

RE Harmer, PhD(UCT)

Associate Professors

SH Büttner, PhD(Frankfurt)

H Tsikos, PhD(Rhodes)

Lecturers/Senior Lecturers

E Grosch, PhD(UCT)

A. Kazerouni, PhD(Aarhus)

Senior Instrument Scientist

N.N.

Professor Emeritus

JS Marsh, PhD(UCT)

Research Associates

AE Moore, PhD(UCT)

RN Scoon, PhD(Rhodes)

EMW Skinner, BScHons(Rhodes)

R Prevec, PhD(UKZN) PhD(Wits)

B Zhao, PhD(Wits)

R Gess, PhD(Wits)

N MacLoughlin, PhD(Oxford)

Geology (GLG) is a six-semester subject which may be taken as a major subject for the degrees of BSc, BCom, BJourn and BEcon (Mineral Economics).

Geology is a recommended co-major with other Science majors such as Chemistry, Physics, one of the Mathematical Sciences, Life Sciences, Geography, and Environmental Science. A B.Sc. in Geology and Economics is also offered.

To major in Geology, a candidate is required to obtain credit in the following courses: GLG 1 (comprising EAR 101 and GLG 102); GLG 2; GLG 3. Credit is also required in CHE 101 and at least one other appropriate first year semester course chosen from amongst those offered in the departments of Chemistry, Mathematics or Physics. Students are strongly advised to include additional courses in these subjects in their curriculum.

Two, or in some cases four, semester-credits in Geology are allowed as credits for degree/diploma curricula in the Faculty of Humanities.

Field-work is a necessary part of Geology courses and a field course fee is payable annually, or per semester in EAR 101 and GLG 102.

See the Departmental Web Page <http://www.ru.ac.za/geology/> for further details, particularly on the contents of courses.

FIRST-YEAR LEVEL COURSES IN GEOLOGY

Geology 1 consists of two first-year courses, namely Earth Science 101 (jointly taught by the Geology and Geography departments) and Geology 102 which are taught normally in the first and second semesters respectively. Students who take both Geography 1 and Geology 1 will have to take an additional semester course in an appropriate subject during the first semester to ensure that they have enough credits for their degree. Credit may be obtained in each course separately and, in addition, an aggregate mark of at least 50% will be deemed to be equivalent to a two credit course GLG 1, provided that a candidate obtains the required sub-minimum in each component. Supplementary examinations may be recommended in either course, provided that a candidate achieves a minimum standard specified by the Department.

EAR101 is a suitable semester-credit for non-science majors. Students may not register for GLG 102 unless they have obtained at least 35% or greater and met the subminimum requirements in both the theory and practical papers for EAR 101. Credit in GLG 1 is required before a student can proceed to any second year course in Geology.

Earth Science 101 (EAR 101) is taught jointly by the Departments of Geology and Geography, and focuses on the topic: "Introduction to Earth Systems". This course introduces the processes that have shaped the Earth and its environment over both geological and recent time scales. The interrelationships between the earth, the atmosphere and living organisms forms a key theme through the course. No prior background in geology or geography is required.

GLG 102, in the second semester, includes a more detailed introduction to the basic principles of geology and to the geology of South Africa. Practical work focuses on the recognition and interpretation of geological maps. Short (one-day) local field excursions are also conducted.

SECOND-YEAR LEVEL COURSES IN GEOLOGY

There are two second-year courses in Geology. GLG 201 is held in the first semester and GLG 202 in the second semester. Credit may be obtained in each course separately and, in addition, an aggregate mark of at least 50% will be deemed to be equivalent to a two-credit course GLG 2, provided that a candidate obtains the required sub-minimum in each component. No supplementary examinations will be offered for either course. Practical reports, essays, seminars, class tests, and field course reports, collectively comprise the class mark, which forms part of the final mark.

Credit in GLG 1 is required before a student may register for GLG 201 and attendance in GLG201 is required before a student may register for GLG202. Credit is also required in CHE 101 and at least one other appropriate first year semester course chosen from amongst those offered in the departments of Chemistry, Mathematics and Physics. Permission may be granted to repeat these courses concurrently with GLG 201 and GLG 202.

GLG 201 and 202

These courses consist of lectures and associated practical work through introductory courses in mineralogy, geochemistry and petrology (igneous, sedimentary and metamorphic), as well as in structural geology, palaeontology, geophysical methods, and hydrogeology. The course includes a compulsory field course in appropriate mapping and stratigraphic techniques which is normally held in the September term break.

THIRD-YEAR LEVEL COURSES IN GEOLOGY

There are two third-year courses in Geology. GLG 301 is held in the first semester and GLG 302 in the second semester. Credit may be obtained in each course separately and, in addition, an aggregate mark of at least 50% will be deemed to be equivalent to a two-credit course GLG 3, provided that a candidate obtains the required sub-minimum in each component. No supplementary examinations will be offered for either course. Practical reports, essays, seminars, class tests, and field course reports, collectively comprise the class mark, which forms part of the final mark.

A student may not register for GLG 301 before (a)

first obtaining credit in at least one second-year Geology course and having adequately performed in the other; (b) first obtaining credit in the compulsory ancillary courses in chemistry or physics or mathematics. Attendance in GLG 301 is required before a student may register for GLG 302.

GLG 301 and 302

These courses include “advanced” modules in igneous, sedimentary and metamorphic petrology, in addition to structural geology and palaeontology, which follow on from the introductory courses in GLG2. GLG 3 also includes the course in economic geology and in low-temperature geochemistry. It comprises lectures, practical work and essays and/or oral presentations, and includes a field course normally held in the September term break.

GEOLOGY HONOURS

The course comprises a theoretical component (lectures, tutorials, seminars, essays), related practical work, a field school and a research project. Depending on staff availability the topics covered in the course may be drawn from the following: research and analytical techniques, geochemistry, mineralogy, igneous petrology, metamorphic petrology, sedimentology, basin analysis, structural geology, palaeontology, Earth history, geotectonics, ore-forming processes, geohydrology, and exploration techniques. Honours students should consult with appropriate members of staff for guidance regarding the research project and are encouraged to formulate their own projects. The results of the research project are submitted in the form of a comprehensive report.

MSC AND PHD DEGREES

The Department pursues an active programme of research into a wide range of problems in Earth Science, leading to the award of the MSc or PhD degree. Students with Honours degrees are encouraged to participate in these research programmes and prepare theses on their research work.

In addition the department offers two professionally-oriented postgraduate courses leading to the award of Master's degrees in Exploration Geology or Economic Geology.

Requirements for the MSc and PhD degrees are given in the General Rules. Prospective candidates

may write for further details on any of these courses. A detailed booklet on postgraduate courses is available on request.

MSc in Exploration Geology

This advanced course is open to candidates holding the BSc(Hons) degree, or its equivalent. Two to three years' relevant professional experience is an additional recommendation. In exceptional cases only, applications may be considered from candidates who hold a BSc degree and have at least five years' relevant experience.

The course is designed to cover the most important theoretical and practical aspects of the exploration for, and evaluation of, mineral and ground-water resources. Instruction is through the medium of lectures, seminars, directed reading, assignments and practical work led by the staff of the Department, and supported by substantial input from experts drawn from industry and other universities.

Field-work visits to areas of economic mineralization, and report writing, form integral parts of the course. The evaluation of candidates is based on their written and verbal presentations throughout the course.

Requirements for the award of the degree include the completion of any four modules from those defined below, and the submission of a dissertation on a topic selected in consultation with the Programme Director. Award of the degree requires an aggregate mark of at least 50% on all assessed components. The Programme will be offered on a part-time basis only, wherein candidates will take 1 to 2 modules per year over two to three years. Each module requires 4-6 weeks of full-time attendance, following which such written reports as are prescribed are to be submitted within a specified period. Components of individual modules offered in any specific year will be subject to lecturer availability and sufficient demand.

Modules are constituted as follows:

Module MT: Classification of ore deposits; ore petrology, geochemistry and mineralogy; mafic-felsic magmatism and mineralization; magmatic ore deposits and exploration methods.

Module EVT: Mineral evaluation techniques, including mineral economics; ore reserve and resource estimation; geostatistics and risk analysis; DataMine; project management and QA/QC.

Module EXT: Exploration techniques, including ore microscope; geochemistry; geophysics; remote sensing; GIS; structural geology; SABLE and drilling.

Module HS: Hydrothermal and sedimentary processes and ore formation; hydrothermal ore deposits; volcanogenic and sedimentary exhalative deposits; sedimentary ore deposits; exploration methods.

Modules MT and HS include a field course of approximately two weeks. Areas where these courses are normally conducted include Mpumalanga, the Bushveld Complex, the Witwatersrand and Transvaal Basins, and Namaqualand.

MSc in Economic Geology

This course is designed for graduates holding the qualification of BSc (Hons) or equivalent, and lays greater emphasis upon a research thesis than the degree in Exploration Geology. Previous professional experience is not a pre-requisite for admission. The requirements for the degree are the completion of any two of the modules listed under the entry above for Exploration Geology, and the submission of a thesis based on original field or laboratory work on economic geology. Candidates may enrol on either a full-time basis (in which case a minimum of 12 months should be set aside for completion of the degree) or part-time basis.